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REPORT

OF

COLUMBIA HOSPITAL FOR WOMEN

AND

LYING-IN ASYLUM,

WASHINGTON, D. C.

BY

J. HARRY THOMPSON, A. M., M. D.,
SURGEON-IN-CHIEF.

WITH

AN APPENDIX

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COLUMBIA HOSPITAL,

Washington, D. C., October 31, 1872.

SIR: In compliance with your request I have prepared and herewith transmit a summary of the principal operations performed by me in the "Columbia Hospital for Women," from March, 1866, to June, 1872.

A few cases which have occurred outside the hospital are included in the report as illustrating the advantages or disadvantages of special forms of treatment which have been pursued.

The brief time allowed for the preparation of this report has precluded the possibility of giving the details of all the surgical cases, (some seven hundred in number,) or entering at any length into the history of the various diseases which have required surgical interference. Little more has been attempted than a faithful clinical record.

Much of the success which has attended my labors in this institution has been due to the liberal appropriations made by Congress, which have enabled the directors to furnish competent nurses, talented assistants, and place at my disposal every necessary appliance.

With the increased accommodations afforded by the enlargement of the building, and its perfect system of heating and ventilation, it may reasonably be expected that the future record will be an improvement upon the past.

Accompanying this report is one from each of three of the departments of the dispensary connected with the hospital: "Diseases of women," "Diseases of children," and "Diseases of the eye and ear;" while containing much of interest, they are necessarily incomplete, as it was impossible to allow sufficient time for their preparation.

I have the honor to be, very respectfully, your obedient servant,

J. H. THOMPSON, M. D.,

Surgeon-in-chief.

Hon. COLUMBUS DELANO,

Secretary of the Interior.

PREFATORY REMARKS.

The medical art, in its crude beginnings, grew out of the absolute wants and necessities of mankind. With the progress of civilization, and the growing requirements of an advanced condition and augmented population, its appliances and laws have been developed, and its scope expanded, until what was first mere haphazard experiment has assumed the accuracy and almost positiveness of a broad inductive philosophy.

Medicine has moved, *pari passu*, with other sciences in the march of intellect, and the demonstrations of its excellence and progress were never more startling than at this moment. The perfection of medicine as a science, however, we dare not affirm. Struggle and approximation, learning to "labor and to wait," fortunately constitute the law of our intellectual constitution, thus affording that constant stimulus to study and experiment without which indolence would take possession of the student, and mental discovery cease altogether.

The disposition to cultivate scientific medicine, both in theory and practice, was never more earnest than at present. Natural philosophy, chemistry, anatomy, physiology, pathology, are, each and all, pouring their contributions into the common stock, and aiding in the development of principles. Prominent among the agencies which are adding largely to practical results may be mentioned the enlarged facilities for clinical observation, the more frequent devotion to specialties, and, last but not least, the careful description of the history, treatment, and results of cases in the wards of well-regulated hospitals.

No department of pathology has been so little understood or appreciated as that embracing the accidents and maladies peculiar to the female sex, and it may with equal truth be asserted that in no branch of practice have the labors of the specialist been attended by more enlarged discoveries or more satisfactory results. Among those who will be regarded as pioneers in this

region of inquiry and experiment, the names of Henry Bennett, Simpson, Baker Brown, Emmet, Sims, Atlee, Thomas, Storer, and others, will promptly suggest themselves to the mind of the gynæcologist. As a gleaner in a field so successfully reaped by others, the author of this report has, through the generous provision made by the Government in aid of private enterprise, been enabled to establish a hospital for the wants of lying-in women, and for the surgical treatment of accidents and diseases of the uterine system. Since its organization it has been in his power to treat a large number of cases with gratifying success, the most of them calling for surgical interference. The operations have been chiefly confined to cases of cystocele, rectocele, vesico- and recto-vaginal fistula, prolapsus uteri, the restoration of aggravated forms of lacerated perineum, and obstructive dysmenorrhœa.

Well-regulated hospitals, having the proper hygienic appliances, with careful medical attendants, and skilled, judicious nurses, are constantly furnishing material of great interest to the community, and of inestimable value to the profession. It is expected of the chiefs of such institutions that they will not content themselves with the mere *éclat* of practical surgery, in the ward or theater, surrounded by an admiring class of students and associate practitioners, but carefully record and digest the history of all important cases, and publish them for the benefit of the medical public and the advancement of scientific truth. Animated by this view, the author tenders his report as an humble contribution to a department of surgery which has enlisted his liveliest interest and most careful study and reflection.

As yet, the Government has caused to be established two hospitals in this District, the Insane Asylum and Columbia Hospital for Women. The flourishing condition of these suggests the propriety of developing, by the establishment of additional model hospitals, other important specialties. Let each of these institutions be presided over by suitable talent, and full reports be required annually upon each and every case treated. The aggregate of such annual reports would constitute a library in itself of incalculable advantage to the whole nation. The Government has already indicated extraordinary appreciation and liberality in the publication and free diffusion of important scientific truths. Let this spirit find further expansion, until other branches of knowledge, important to the physical well-being of the population, shall be enlarged and rendered practical under the fostering care and direction of our beneficent republic.

A great boon would be conferred by the establishment of a department of hygiene, its object being the prevention of disease. This, we are happy to know, has been already anticipated by an eminent medical gentleman of the District, who has had presented to Congress a bill and memorial looking to the organization, by the Government, of a grand, national, sanitary bureau, for the purpose of collecting and distributing reliable information on every conceivable subject connected with public hygiene, and by thoroughly sustained observation and experiment enlarging the present limits of knowledge in this most important department of labor. This enterprise, we are gratified to say, has almost universally received the indorsement of the leading sanitarians of the country, and the American Sanitary Association, recently organized, have deemed it of sufficient importance to appoint a committee for the purpose of advancing the success of the movement.

Already the scientific world owes much to the efforts of the Government at the capital of the nation. The brilliant labors of Surgeon-General Barnes and his distinguished collaborator, Dr. Woodward, and others, have attracted universal attention and admiration. Nor must be overlooked the valuable reports of the Agricultural and Educational Bureaus, which are annually flooding the land with light upon the special subjects of which they treat; or the commendable interest and zeal manifested by Mr. Delano, the present Secretary of the Interior, in the medical and other institutions under his immediate supervision and direction.

In this connection it may not be considered inappropriate to present a *résumé* of the operations of the institution under my charge, from its commencement in March, 1866, to the end of June, 1872; and I cannot permit this opportunity to pass without most cordially congratulating the directors upon the prosperity of an institution which they have labored to establish upon its present firm basis, and to rejoice with them in the consciousness that the institution is free from debt, its buildings and grounds paid for, and its future support secured by the fostering care of a beneficent government.

The year 1861 found the city of Washington, the capital of the United States, with a population of over one hundred thousand souls, without a civil hospital or dispensary to which the poor of its resident or floating population could apply for medical assistance in case of disease or accident. Such a condition of things constituted an anomaly in the history of municipalities.

Large numbers of females were attracted to the city during the war, in search of relatives and friends, or for information from the Departments. Anxiety and fatigue, as a natural consequence, caused suffering and disease, and hundreds of women, prostrated by sickness, and without means, were thrown upon the charities of the residents of Washington and the representatives from the different States to which they belonged. With the perseverance and zeal characteristic of the order, the Sisters of Charity succeeded in opening Providence Hospital, which took the place of the old infirmary; but its accommodations, strained to their utmost capacity, were inadequate to the demand.*

The absolute want of a hospital exclusively for women was apparent, but the exigencies of the war were so vast, and the demands upon private resources so great, that it was deemed inexpedient to attempt its establishment until the fall of 1865. In November of that year I laid my plans before the Rev. Drs. A. D. Gillette and C. H. Hall, and Moses Kelly, esq., whom I invited to co-operate in the enterprise. They lent their valuable influence and service most readily, and, upon consultation with Surgeon-General Barnes, it was decided to lay our plans before Hon. E. M. Stanton, then Secretary of War. His comprehensive mind required no argument to convince him that such an institution was needed, and that, to be successful, it must be fostered by the Government. Indeed, nine-tenths of its beneficiaries would necessarily be wards of the nation, coming, as they did, and still do, from all portions of the country, and, although temporarily resident here, claiming citizenship in the States from which they came.

As was his wont, he unhesitatingly assumed the responsibility of authorizing the Surgeon-General to furnish completely fifty beds, and to issue a full supply of medicines and medical stores; insisting, however, that twenty of those beds should be used exclusively for the wives and widows of soldiers of the United States Army.

Liberal contributions from Messrs. Charles Knapp, H. D. Cooke, Philp & Solomons, and others, enabled us to lease the Hill mansion and grounds, on the corner of Fourteenth street and Massachusetts avenue, into the possession of which we entered February, 1866.

Mrs. A. J. Brown, ever foremost in every charitable enterprise, became

* Since writing this report, I find that the credit of establishing Providence Hospital is due to Dr. Toner, of this city, and not to the Sisters of Charity, they having taken charge of it after he had established it.

warmly enlisted in behalf of the institution, and, by her personal efforts, secured donations sufficient to furnish the parlor and executive portion of the building. A board of directors was organized, of which the Rev. Dr. Gillette was president, and the Rev. J. N. Coombs secretary, and, on the 4th day of March, 1866, the Columbia Hospital opened its doors for the reception of patients, with a heartfelt prayer to Almighty God that He would bless the undertaking and prosper the efforts of its founders.

Application was made to Congress for a charter, which was granted, and approved June 1, 1866.

The same year Congress appropriated ten thousand dollars to assist in the support of the institution, and each year, since that time to the present, the appropriation has been enlarged with the increasing demands of the hospital. At the expiration of the lease of the Hill mansion, the proprietor disposed of the building and grounds, and we were compelled to leave. The present building was then leased from Dr. Maynard for two years, at the end of which time a conditional purchase was made of the building and grounds, upon most advantageous terms to the hospital, the details of the negotiation having been conducted by Moses Kelly and A. S. Solomons, esqs.

At the last session of Congress an appropriation was secured sufficiently large to enable us to complete the purchase and deed the property to the United States, in accordance with the conditions of the bill.

Thus, after six years of untiring efforts, we have eventually accomplished what was so earnestly desired—the permanent foundation in Washington of a hospital devoted exclusively to the treatment of diseases peculiar to women.

Accompanying the appropriation for the purchase was one for repairs and alterations, which, with the amount in the hands of the treasurer, is sufficient to provide for the present alterations. These, when completed, will give us an abundance of room for the free patients, and provide a number of private rooms for pay-patients.

The committee appointed to carry out these repairs and alterations consists of General J. K. Barnes, chairman, J. T. Mitchell, esq., and the Hon. George Taylor. They have secured the services of Mr. Clark, Architect of the Capitol Extension, who has kindly taken charge of the work, giving his services gratuitously.

The design for the alterations was made by General Barnes. It is

comprehensive, and eminently practical. The objectionable features of the building have been removed, thorough ventilation and sewerage secured, and, when all has been completed, we shall be in the possession of a building of which we may be justly proud.

Much has been said by the enemies of the District as to the unwillingness of the people to support their poor, and render their fair share of aid to such charitable institutions as have sprung up in their midst; but our experience is very different. The old city government and the present District government have done their full share toward the support of such of the inmates of this institution as were properly chargeable upon the District, have made the necessary appropriations promptly and generously, and have in no respect drawn on the General Government for the support of their local poor.

By comparing the reports of this institution for the last two years with the reports of similar institutions in other parts of the country, it will be found that, in proportion to our fixed population, we furnish gratuitously medical and surgical relief to at least twenty per cent. more patients than are relieved at the hospitals in New York, Philadelphia, and other large cities.

The number of deaths that have occurred in the hospital are very much below the average; and, during the last four years, not one single case of death has occurred as the result of surgical interference, although within that time a large number of very important operations have been performed, all of which have been successful.

The lying-in wards of this hospital have been free from any epidemic during the whole time they have been open, and not one death has occurred from difficult or natural labor where the patient has been under observation for a reasonable time prior to parturition.

The number of patients treated at the hospital during the current year has been more than double that of last, and nearly as many as the four preceding years.

Summary of cases treated.

The number of patients under treatment on June 30, 1871, was	166
Number admitted during the year ended June 30, 1872, as outdoor patients	4,109
Number of indoor patients	301
Total	4,576
Number of prescriptions compounded	8,165

RESULTS.

Number cured	3,708
Number relieved	561
Number died	21
Number incurable	35
Number results unknown	101
Number under treatment	150
Total	4,576

NATIVITY.

American	3,236
English	13
Irish	1,080
German	212
French	3
Spanish	5
Russian	1
Canadian	1
Scotch	22
West Indian	3
Total	4,576

CITIZENSHIP.

District of Columbia	2,312
Virginia	1,018
Maryland	946
Texas	5
Ohio	13
Massachusetts	26
Maine	12
Vermont	2
Connecticut	7
Illinois	15
New York	46
Michigan	8
Indiana	21

New Jersey	20
Delaware	23
Unknown	102
Total	4,576

Summary of the entire operations of the hospital from March 4, 1866, to June 30, 1872.

Total number of patients admitted	11,455

RESULTS.

Number cured	9,457
Number relieved	1,081
Number incurable	257
Number died	81
Number sent to Insane Asylum	7
Number results unknown	422
Number under treatment June 30, 1872	150
Total	11,455

NATIVITY.

American	8,116
Irish	2,132
German	899
Scotch	109
English	147
French	17
Spanish	14
Austrian	7
Mexican	4
Russian	1
Hungarian	4
West Indian	4
Canadian	1
Total	11,455

CITIZENSHIP.

District of Columbia	4,917
Virginia	2,216
Maryland	2,106
New York	392
Pennsylvania	227
Massachusetts	174
North Carolina	127

South Carolina	126
New Jersey	104
Ohio	86
Iowa	62
Indiana	68
Missouri	43
Connecticut	49
Delaware	60
Michigan	37
Vermont	31
Maine	39
Texas	29
Illinois	37
Florida	20
New Hampshire	18
Kentucky	3
Rhode Island	2
Unknown	482
Total	11,455

With these discursive prefatory remarks, I present the report of my labors as chief of the Columbia Hospital for Women, trusting it will neither disparage the Government which has so generously come to the aid of the institution, nor do discredit to the profession with which I am proud to be associated.

J. H. THOMPSON, M. D.

1324 Massachusetts Avenue.

OPERATIONS

FOR THE

RADICAL CURE OF LACERATED OR RUPTURED PERINEUM.

REPORT OF THIRTY-FOUR SUCCESSIVE OPERATIONS RESULTING FAVORABLY.

Since I have been in charge of Columbia Hospital I have operated fifty-three times for the cure of this most distressing of all the accidents attending labor. In each case the operation has been eminently successful.

Few years have passed since this accident was considered incurable, the difficulties attending an operation for its relief having been looked upon as insurmountable. Attempts were therefore rarely made at surgical interference, and these proved mostly unsuccessful.

The following cases have been selected as comprising all the varieties and complications of this accident, the remaining nineteen being similar in character to those reported.

I claim little originality in the treatment of this lesion, simply modifying in some respects the operation as practiced by that illustrious pioneer in gynæcological surgery, Baker Brown.

The tabulated reports from the lying-in hospitals of Europe and America furnish no data from which we can judge of the relative frequency of this accident to the number of women delivered. Their silence on this subject can only be accounted for by a neglect to examine the parts after delivery, or from the mistaken notion that a ruptured perineum necessarily reflects discredit upon the attending accoucheur. It certainly is an accident of no uncommon occurrence, both in private practice and in public institutions, and under the care of the most accomplished obstetricians; its frequency being readily accounted for when we consider the various causes which,

either singly or in combination, may produce the lesion. Churchill gives thirteen causes:

1. Sacrum too perpendicular.
2. Arch of the pubes too acute.
3. Thickened state of the urethra and subjacent parts.
4. The too rapid passage of the head.
5. Exostosis in any part of the pelvic cavity.
6. Excessive breadth of the perineum.
7. Rigidity of the perineum.
8. Tissues of the perineum weakened by disease.
9. Occlusion of the lower outlet of the hymen.
10. Malposition of child's head.
11. Malpresentations.
12. Exercise of too much voluntary force by the patient.
13. Want of care when instruments are used.

Tyler Smith only alludes to the seventh division of Churchill, "rigidity of the perineum."

Gaillard Thomas gives four causes: parturition, use of forceps, manual delivery, craniotomy.

Graily Hewitt simply refers to difficult labor.

Byford gives as causes: straight sacrum, rigidity of perineum, large and unusually ossified head, too narrow arch to the pubes, unskillful use of instruments.

Baker Brown suggests as the principal causes, "the dimension of the child's head being too large absolutely and relatively for the capaciousness and expansibility of the maternal outlet; an unnatural rigidity of the perineal tissues, or extreme width of the same; unskillful use of instruments; parturition for the first time at a very early or late age."

Of the fifty-three cases which have come under my care, thirty-three were of long standing, *i. e.*, varying from one to seventeen years, and their histories, obtained principally from the patient, are not altogether reliable. Twenty were recent cases. In forty-four instances the accident occurred at the birth of the first child; the remaining nine were multiparæ. In two of the multiparæ, instruments were used, as also in sixteen of the primiparæ. In no case could I discover any abnormal acuteness of the arch of the pubes,

and in only two was the sacrum unusually straight. Two had been breech presentations, and eleven were extremely rapid labors, accompanied by violent expulsive pains; the patients stating in these cases that they felt the tissues tear, calling the attention of the attending physician to the circumstance.

From my own experience I consider the principal exciting causes to be:

1. Violent expulsive efforts by the patient, on contact of the child's head with the perineum, in most cases induced by too much manipulation.

2. Unusual width of the child's shoulders in proportion to the size of the head.

3. Extreme width of the perineum.

4. Inelasticity of the perineum occasioned by fatty degeneration of its tissues.

5. Unskillful use of the forceps.

The fourth cause occurs most frequently after thirty years of age.

The varieties of lacerated or ruptured perineum are: complete but uncomplicated, the sphincter ani remaining intact; complete and complicated, attended by rupture of sphincter ani; incomplete, when the laceration extends only a part of the distance between the fourchette and anus; perforating, this last being extremely rare.

The consequences of this accident are extremely grave, and, in many cases of long standing, incapacitate the patient for any exertion in the erect posture.

The principal sequelæ are: prolapsus of the posterior wall of the vagina and anterior wall of the rectum or "vaginal rectocele;" prolapsus of the anterior wall of the vagina and the posterior wall of the bladder, or "vaginal vesicocele;" procidentia of the uterus, with all the complications attending each of these conditions.

These are not *supposed* results of the accident, but necessary *consequences*, as we can readily comprehend when we examine the anatomy of the female perineum and maternal outlet, and the relative anatomy of the "genito-urinary organs." From some inexplicable cause we find the anatomy of the female perineum neglected in most works; the male perineum occupying the whole attention.

By reference to Fig. 1, Plate 1, we shall find that the posterior fibres of the sphincter vaginæ and the anterior fibres of the sphincter ani are inserted

into the tendinous structure and fascia of the perineum. When a complete rupture occurs, the sphincter ani, contracting from its posterior insertion on either side of the coccyx, draws the anterior wall of the rectum backward; the fibres of the sphincter vaginæ, being torn from their posterior attachment, lose all power of drawing the posterior wall of the vagina forward and upward; the transversalis perinei draws the lacerated edges outward and upward, widening the gap made antero-posteriorly; and the vagina, which, normally, is a closed canal, becomes a mere chasm, and the floor of the pelvis is lost.

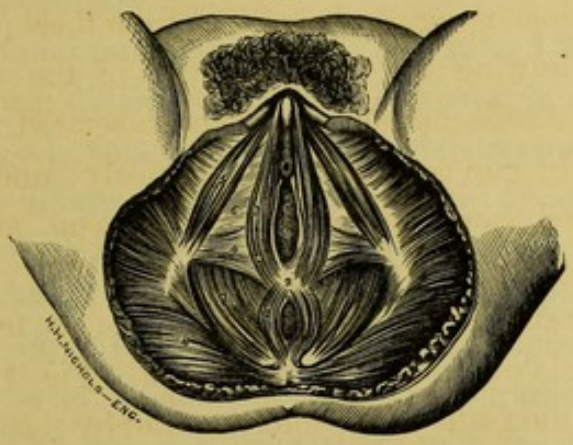
Fig. 2, Plate 1, shows the relative anatomy of the female genito-urinary organs in the normal condition of the perineum. Fig. 1, Plate 2, shows the change produced in the plane of the inferior strait by the loss of the perineum, and will readily explain the causes of the complications which attend all cases of long standing

The posterior wall of the vagina becomes straightened, and the tissues, being relaxed, permit of the formation of a pouch at the lower portion, immediately above the internal sphincter, in which the fæces accumulate, and vaginal rectocele soon follows, drawing on the posterior *cul-de-sac* of the vagina, and changing the axis of the uterus, which now hangs perpendicularly over the external outlet. All support being lost, it descends, drawing with it the anterior wall of the vagina and the bladder. A *cul-de-sac* of the bladder is soon formed, in which the urine is retained, and the bladder can only be completely emptied by the patient introducing her finger into the vagina and temporarily replacing the uterus. In addition to her physical sufferings, a woman in such a condition is totally unfitted for the marital relation.

It is unnecessary to use argument to convince an unprejudiced mind of the advisability of an operation, however severe, which affords a reasonable prospect of restoring the parts to a normal condition and the woman to a life of usefulness.

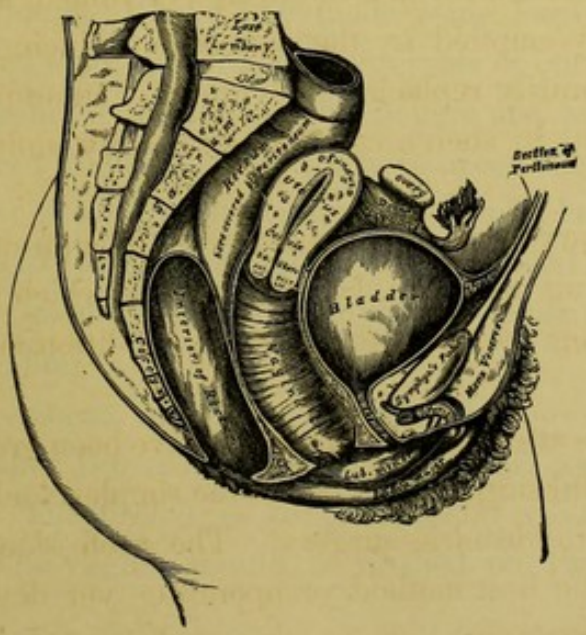
The difficulties attending the operation have been greatly overrated. In the hands of a skillful surgeon it is one of the simplest and certainly most successful operations in obstetric surgery. The profession is indebted to Mr. Baker Brown for the best method of operating yet devised for the radical cure of ruptured perineum, as demonstrated by his eighty-one reported cases.

Fig. 1.



1. Sphincter ani muscle.
2. Pærineal center, with inter-crossing of the sphincter ani and sphincter vaginæ muscles.
3. Sphincter vaginæ muscle.
4. Transversus perinei muscle of the female.
5. Erector clitoridis muscle.

Fig. 2.



Relative position of the genito-urinary organs of the female. (Normal.)

As this report is submitted with the hope that it may be useful to some of the younger members of the profession, I may be excused for entering more fully into the details of the operation and the after-treatment than would be otherwise necessary.

In some of the important stages of the operation I follow the plan laid down by Baker Brown, differing from him, however, in my treatment of the sphincter ani, and also in some points of the after-treatment. It may be as well to point out the difference here: Baker Brown divides the sphincter ani on either side of its coccygeal attachments, and considers it a *sine qua non* to success; I never divide it unless it has been torn through anteriorly, believing that it increases the risk of the operation by exposing so much more surface to the process of inflammation and suppuration, and at the same time the irritation set up necessarily interferes with the chances of union by first intention in the wound immediately in front. It is, however, absolutely necessary that the sphincter remain quiescent during the process of union, and until the new tissue has become thoroughly organized. To secure this, I adopt the plan first suggested by Professor Van Buren, of New York, *i. e.*, "paralyze the sphincter." This is done perfectly by introducing the thumbs into the anus, seizing the nates on either side, and making gradual traction until the thumbs touch the tuber ischii. The paralysis following this remains for two or three weeks, but is never followed by permanent loss of power, which is sometimes the result of division.

Instead of the bougie, I have had made some hard-rubber tubes, the size of an ordinary catheter, perforated at intervals of one-fourth of an inch. The advantages I claim for these over the bougie are, first, a uniform support on either side, not yielding at the parts between the sutures, as is the case with the bougie; secondly, they are more cleanly, hence less irritating.

In place of waxed thread I use silver wire. I need say nothing as to its superiority. The mode of fastening it will be explained when I detail tha steps of the operation.

In the after-treatment, instead of keeping the bowels constipated, as recommended by Baker Brown, I keep them in a soft condition, securing a passage every day. The discharges are painless, no resistance being offered by the sphincter. The vagina should be washed out twice a day with the following:

℞ Aquæ puræ, ℥j ss.
Glycerine, ℥ss.
Acidi carbolici, gr. viij.

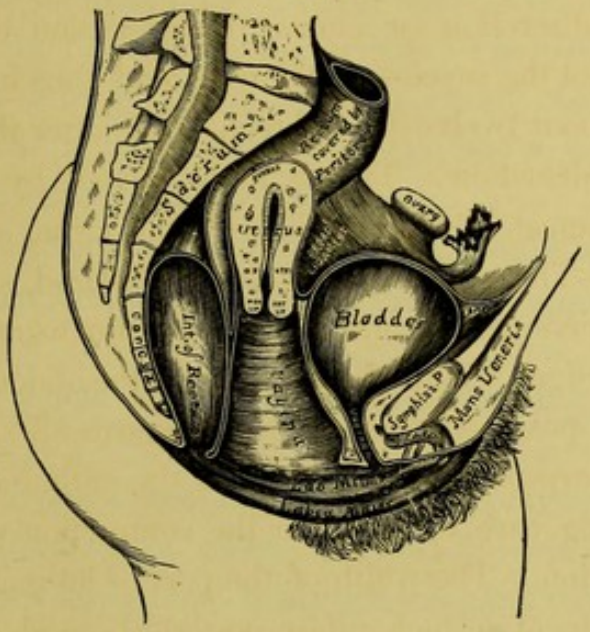
The urine must be drawn every six hours. For this purpose I educate my nurses, and never consent to operate without one of them being in attendance from the commencement until the patient is perfectly recovered, as the least indiscretion or clumsy manipulation of an ignorant person would jeopardize the success of the case, and thus injure both patient and surgeon. In about twelve to eighteen hours after the operation, the parts may become œdematous. This is to be treated by making several punctures with the lancet, which will liberate the serum and relieve the tension.

Operation.—The patient, being fully ætherized, should be laid upon a firm table of convenient height for the operator when sitting; the buttocks brought to the edge; the thighs flexed upon the abdomen; the knees turned out, and held in position by assistants. Remove all hair from the parts, and with a small, sharp-pointed scalpel, mark the outline of the part you intend to remove, taking care to allow for the contraction which will necessarily follow cicatrization. The width of the part to be removed must not be less than three-fourths of an inch antero-posteriorly, and extend the same width upward on either side to the point where the perineum started before the accident.

It is very important that the dissection be carefully made, and hence it is better to remove the membrane in one piece. For this purpose the knife is better than scissors.

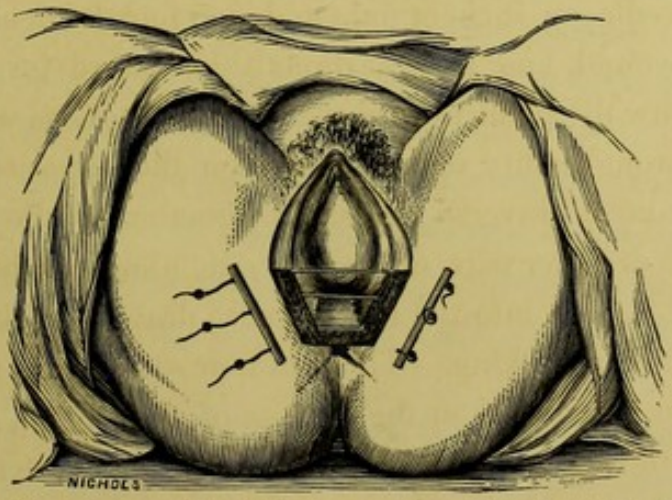
The next step is to insert the sutures. I use a strong curved needle, about three inches long, with a cutting-point only. This is armed with silk doubled, so that, when drawn through, a loop remains at the point of entry. Insert the needle an inch or one and one-fourth inches from the external edge of the wound, and press it directly backward for about half an inch before you turn the point toward the inner edge of the wound, at which part it is to be brought out; enter it again on the opposite side on the inner edge, and make it traverse the same direction to the point of final exit. Select a piece of silver wire of medium size, about ten inches long, bend the end over and hook it into the loop of silk, draw the silk out, and the wires will follow without kinking. Three to four sutures are generally necessary. The first must be entered at the bottom of the wound, so as to control the parts around the anus. The wires, being in position, are to be passed through the tubes, and secured on the patient's left side first, by means of perforated buck-shot, the shot being strongly compressed on the wire, the terminal end

Fig. 1.

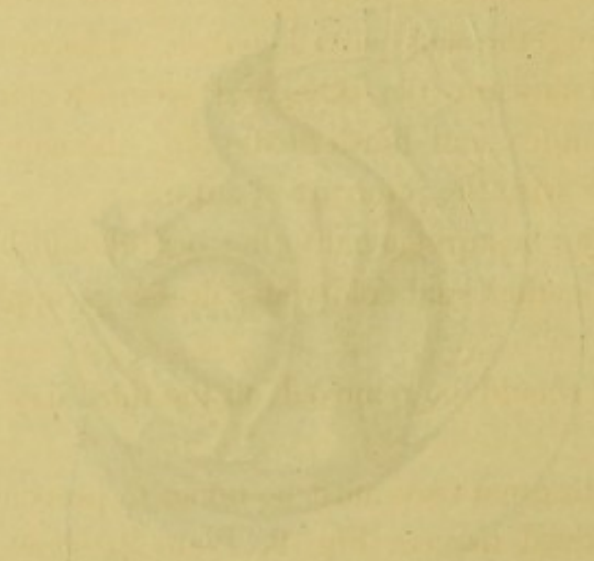


Relative position of the genito-urinary organs of the female after rupture of the perinæum.

Fig. 2.



Position of suture and quills before coaptation of the denuded surfaces.





of which should be bent sharply over, as seen in the illustration, Fig. 2, Plate 2. Bleeding having ceased, the cut surfaces are to be carefully cleansed, and the parts coaptated by drawing first on the central wire, an assistant gently pressing the soft parts together. The right tension being obtained, slip the shot down to the tube, and securely clamp it. Proceed next with the lowest suture, and finish at the top; the superficial edges are to be brought together with the interrupted suture.

The patient, having been removed to her bed, should be placed on her side, her knees tied together, and cold-water dressings applied for the first twenty-four hours.

The deep sutures should be removed on the third day; the superficial ones on the ninth.

For the first month great care must be taken to prevent undue traction upon the newly-cicatrized tissue. Fig. 2, Plate 2, shows the outline of incision, with the sutures in position, ready for the parts to be brought into coaptation

Case 1.

Complete rupture, with Prolapsus uteri.—Cure.

Mrs. M. C., aged twenty-seven, admitted to Columbia Hospital, June 28, 1866. She gave birth to her first child twenty months ago, which is still at the breast, the offspring being a fine, healthy boy. Patient complained of constant pain in the sacral region, with profuse leucorrhœa, and prolapsus of the uterus. To retain the womb within the vaginal canal, she was compelled to wear a T-bandage and pad. Her general condition was very anæmic. Vaginal examination, the patient having been placed on her side, disclosed a complete rupture of the perineum, which originally must have measured at least one and three-fourths inches in extent. Os uteri patulous, with granular erosion of both lips, which were much hypertrophied. There was a general catarrhal condition of the mucous membrane of the vagina; the pelvis was very capacious. Her labor had lasted but half an hour.

General treatment.—The child was weaned immediately, and the mother placed upon generous diet, with six ounces of wine daily. Iron was administered in full doses, absolute rest in the recumbent position having been strictly enjoined.

Local.—Chromic acid was applied to the erosions resulting from friction against the pad, and a pledget of raw cotton, soaked with the following preparation, passed up into the posterior *cul-de-sac*, and allowed to remain twenty-four hours, when it was removed, and a fresh one introduced:

℞ Glycerine, ℥iv.
Tannin, ℥ij.

This treatment was continued for three weeks, the patient improving rapidly in her general health. The rest and astringent application had prevented any descent of the uterus; the mucous membrane had gained considerable tone; and the patient was considered in a sufficiently good condition to bear the operation for radical cure.

July 22.—Patient, having been fully ætherized, was placed in the position advised, and the operation proceeded with as directed.

12 *p. m.*—Ten hours after operation, patient suffering considerable pain, very restless, pulse 120, and irritable, ordered aq. ext. opii, gr. ij, to be administered immediately; ice-water dressing to the vulva, to be changed every few minutes; and the anodyne pill to be repeated in four hours, unless the patient should become quiet.

July 23, 8 *a. m.*—Slept after taking the second pill; much less pain; pulse 100, and softer; one grain of the opium to be taken every four hours until free from pain.

10 *p. m.*—Pulse 88, and soft; little pain since noon; complains of thirst; suspended opium, and gave the "effervescing mixture."

From this time onward everything progressed favorably. The deep sutures were removed on the morning of the fourth day, and the superficial on the ninth, the result being complete union by first intention.

Patient was retained three weeks longer in the hospital to continue the general treatment, being still somewhat anæmic. Discharged, cured, August 21.

On July 24, 1867, eleven months and three days after leaving the hospital, she was delivered of a well-developed boy at full term. The labor was rapid, and the perineum lacerated for about a quarter of an inch, but on the side of the cicatrix. This was allowed to take care of itself, as there remained intact fully one and a quarter inches. She made a good recovery, and has since given birth to another child without any further laceration.

Case 2.

Complete rupture, complicated with Coccyodynia.

Mrs. S——, aged forty-one, married in 1854, delivered of her first child March, 1866, nine weeks previous to the time I saw her. Patient complained of severe pain when sitting, and upon the passage of fæces or flatus from the bowels. The history, given by her medical attendant, was as follows: The labor had been protracted over three days, the patient suffering severely most of the time. A consultation was had on the morning of the fourth day, when forceps were applied, and the woman delivered of a living child. A perineal rupture was noticed at the time, and every attempt made to bring about union of the parts by keeping the limbs tied together and applying local stimulants, but without success.

Upon digital examination I found a fracture or dislocation of the coccyx, about half an inch from the terminal point, which doubtless accounted for the severe pain. The fractured parts were disturbed on every contraction of the levator or sphincter ani muscles. There was also a complete rupture of the perineum.

It was decided to adopt the treatment recommended by Professor Simpson, of Edinburgh, for the injured coccyx, and then to proceed with the operation for the restoration of the perineum.

The double operation it was proposed to perform was fully explained to the patient, and her consent obtained, but she positively refused to inhale any anæsthetic.

The patient being placed on her side, a tenotomy-knife was introduced at the back part of the coccyx, and its muscular and tendinous attachments liberated from both sides and from the tip, the operation occasioning but little pain. After a few minutes' rest, she was placed in the position for the major operation, which was proceeded with after the usual manner, and lasted fifteen minutes.

The result was very gratifying. The severe pain which she had suffered from the injury to the coccyx was immediately relieved; her convalescence became rapid, and continued without one untoward symptom. The restoration of the perineum was complete, union having taken place by first intention throughout its whole extent.

Case 3.

Complete rupture, involving the sphincter ani and recto-vaginal septum.—Cure.

Mrs. T——, aged thirty-one; mother of four children. She was delivered of her last child four months since, at which time the accident occurred.

There was nothing connected with the history of this case which could satisfactorily account for the rupture. The woman was well-proportioned, of fine *physique*, and the infant had no abnormal development of the head or shoulders. Her labor had been of average duration, and not severe, and the same medical gentleman attended her with the last as with the three previous children. No instruments had been used. Her convalescence had been slow; she was unable to sit up before the seventh week, and it was four months after the birth of her child before she could endure the fatigue of journeying from her home in Pennsylvania to Washington.

I saw her the day after her arrival, and, upon examination, found a complete rupture of the perineum, and sphincter ani muscle, the laceration extending about one and three-fourths inches up the recto-vaginal septum. She had had little trouble in controlling the bowels, being naturally of a very costive habit, but flatus passed involuntarily. When the bowels were moved, she suffered great pain, occasioned by the ulcerated condition of the edges of the upper part of the laceration. There had been no prolapsus, and the mucous membrane of the vagina was in a healthy condition, except the edges and apex of the laceration.

It became necessary to perform two distinct operations—first, to restore the integrity of the sphincter ani and recto-vaginal septum; and, secondly, to restore the perineum.

July 3.—Patient, having been ætherized, was placed upon her back, with limbs well flexed upon abdomen. The thickened edges on both sides of the laceration were removed by the scissors, the incisions extending half an inch beyond the apex of the rupture, in order to secure healthy tissue. The edges were carefully approximated by the interrupted wire-suture, and the sphincter ani divided on both sides of the coccyx. The wires were removed on the ninth day, and the parts found to be perfectly united.

August 11.—The operation for restoration of the perineum was performed in the usual manner. The sphincter, having but imperfectly recovered

from the previous division, was not interfered with. On the second day after the operation there appeared so much œdema of the parts engaged within the sutures that I was fearful it might become necessary to remove them; but free puncturing and the application of ice proved sufficient. The deep wires were not removed until the fifth day, when it was found that suppuration had formed in the track of the middle suture, the pus flowing freely upon its withdrawal. This accident was the result of retaining the deep sutures *in situ* two days longer than was necessary; but it in no way interfered with the success of the operation, union being perfect in every part. The superficial sutures were removed on the ninth day. Patient left for her home on September 18, cured.

Case 4.

Complete rupture, eight years' standing.—Cured.

Mrs. H——, admitted into Columbia Hospital, September 17, 1866; seamstress by occupation; mother of two children; complains of severe pain in the sacro-lumbar region, profuse leucorrhœa, and smarting after urination.

Examination revealed complete rupture of the perineum, with eversion of the lower portion of the vagina, which was intensely inflamed. The inflammation was rapidly reduced by the use of glycerine and aqueous extract of opium.

The operation for restoration of the perineum was performed September 27, and the patient left the institution, October 24, cured.

Case 5.

Incomplete rupture.

Mrs. S——, wife of a physician, was delivered of her first child after a protracted labor, the head having rested upon the perineum for six hours. The rupture was discovered on the birth of the child, and I saw her a few hours afterward.

The laceration extended one-fourth of an inch from the anus. The parts having been carefully sponged with a weak solution of carbolic acid in water, the edges were approximated and retained in position by the quilled suture.

The after-treatment differed little from that pursued in cases of long standing. The patient made a good recovery, the operation having been entirely successful.

Case 6.

Complete rupture, Recto-vaginal fistula, and Prolapsus uteri.

Mrs. M——, widow, aged thirty-seven; mother of five children, the youngest being three years of age; complains of constant pain in the back; profuse and offensive discharge from the vagina; loss of appetite and extreme debility.

Examination revealed a complete rupture of the perineum, and a fistulous opening into the rectum two-thirds of an inch in length immediately below the posterior *cul-de-sac*. The uterus measured four and one-half inches, and bled freely upon the withdrawal of the sound, although great care had been used in its introduction; cervix hypertrophied, os patulous, but no ulceration or abrasion.

Treatment.—Hot-water irrigation of the uterus morning and evening, and the following ointment introduced into the cavity of the uterus every third day with the view of reducing the endometritis:

℞ Ungt. simplicis, ℥iv.
Argenti nit. cryst., gr. x.
Aq. ext. opii, ℈j.

A pledget of raw cotton soaked in glycerine, containing four grains of carbolic acid to the ounce, was passed into the *cul-de-sac* morning and evening, the former to reduce the hypertrophy of the cervix and the latter as an antiseptic. Tonics were freely administered, and the patient kept in a recumbent position.

On the seventh week from the commencement of treatment "Sims's" operation for the closure of the fistula was performed with perfect success.

Three weeks afterward the perineum was restored by the usual operation. The patient made a good recovery, and left for her home in West Virginia, January 22, 1867, cured.

I have since learned that this lady married in the following June, and in due time gave birth to a child, but did not learn with what effect upon the perineum.

Case 7.

Complete rupture, of five years' standing.—Cured.

Mrs. C——, admitted into Columbia Hospital January 12, 1867; mother of one child; patient complains of uterine prolapsus whenever she stands or walks; constant pain in the lumbar region, offensive leucorrhœal discharge, so abundant as to compel her to wear a napkin; menstruation occurs once a fortnight.

Upon examination there was found a complete rupture of the perineum, the cervix uteri protruding between the labia, os patulous, and cervix hypertrophied. Patient was placed under constitutional and local treatment, with the view of restoring the uterus and its functions to a healthy condition before attempting the restoration of the perineum. Her recovery was very slow, it being nearly three months before she was in a condition to endure surgical interference.

April 8.—Operation for radical cure performed in the presence of the clinical class. There was considerable difficulty in arresting hæmorrhage, owing to the unusual size of the arterial branches, which were wounded in the dissection. A ligature being inadmissible, we were compelled to rely on torsion, which, in this instance, failed to accomplish the object as perfectly as desired. The deep sutures were removed on the third day; the superficial, on the eleventh. Union perfect.

Case 8.

Complete rupture.—Cure.

Mrs. B——, admitted into Columbia Hospital March 19, 1867; pregnant with her first child. Upon making an examination, in order to ascertain the probable time of labor, it was found that the vaginal orifice was extremely small, as also the lower part of the vaginal canal. The perineum was thick and inelastic, feeling like cartilage. This condition of the parts made it probable that during delivery there would be a rupture of the perineum and lower part of the recto-vaginal septum. The labor was very rapid, and every effort was made to prevent the anticipated accident, but, so far as the perineum was concerned, without success. A severe attack of metro-peritonitis followed delivery, and it was some weeks before an attempt could be made to restore the integrity of the lacerated parts.

May 23.—The usual operation was performed in the presence of the class. The patient's recovery was rapid; union perfect by first intention. She left for her home in North Carolina, June 25th.

The large amount of white, inelastic tissue, and the few muscular fibres, entering into the formation of this woman's perineum makes it liable to rupture at any succeeding labor.

Case 9.

Complete rupture.—Cure.

Mrs. S——, mother of two children, the youngest twenty-eight months old. From the history of this case, which was given entirely by the patient, the rupture must have occurred at her first labor, which was very protracted. She suffered the usual discomforts attending the lesion, but her general health was good, although she had taken but little exercise, owing to the uneasiness about the pelvis.

May 26, 1867.—Patient having been placed in position, chloroform was administered, and the operation commenced, my assistant administering the anæsthetic. When the operation had been about half completed, a sudden cessation of respiration and irregularity of the heart's action supervened. The tongue was instantly drawn forward, and artificial respiration instituted, but, at the end of five minutes, there was no apparent improvement in the patient's condition. The artificial respiration was continued for nearly thirty minutes before we were rewarded by a full-drawn inspiration. Our feelings may be better imagined than described. It is hardly necessary to state that the operation was completed without the further use of an anæsthetic. The patient continued quite feeble for some days, but her recovery was perfect. The same success attended the operation in this as in previous cases. I have since delivered this lady of a well-developed child, weighing eleven pounds, the perineum remaining intact. This is the third case in my practice in which the patient, by the use of chloroform, was nearly lost. I have ceased to employ this agent, finding the sulphuric æther, although slower in its effects, a safer anæsthetic.

Case 10.

Complete rupture.

Mrs. B——, aged nineteen, mother of one child four months old. The rupture in this case had been produced by the unskillful or careless use of forceps by a German midwife, who applied them without the consent of the patient or her husband. The limbs had been kept together, and warm, stimulating applications made to the vulva; but the urine and discharges, coming in contact with the lacerated edges, prevented union.

June 7, 1867.—Operation performed at noon. In the evening the patient complained of great pain, and was very restless; ordered a full dose of opium, to be repeated in six hours. The following morning the parts were so much swollen that I found it necessary to puncture them freely, remove the middle suture, and loosen the upper; warm applications were kept constantly applied. This treatment relieved the pain, and no other unpleasant symptom presented itself. The remaining two sutures were not removed until the fourth day, when, contrary to expectation, perfect union had taken place.

This patient was very fat about the genitals, and the error which caused the difficulty in the case consisted in drawing too tightly on the wires, not making sufficient allowance for the swelling which would necessarily follow where there was so much cellular tissue included.

Case 11.

Complete rupture, complicated with Polypus of the uterus and Hæmorrhoids.

Mrs. M——, admitted March 7, 1867; aged forty-three, mother of nine children; married at fifteen years of age; first child born before she had reached her sixteenth year; patient emaciated, and almost exsanguinous. She had hæmorrhage from the uterus every few days, and from the hæmorrhoids whenever the bowels were moved.

A careful examination was made, and, in addition to a complete rupture of the perineum, there was discovered a group of ulcerated hæmorrhoids. The uterus had become much enlarged, and the introduction of the sound was followed by a copious discharge of blood; a sponge-tent was introduced to determine the uterine diagnosis, and upon its withdrawal the

next day a large polypus was discovered. The treatment was first directed to the removal of the polypus, the écraseur being used in preference to the ligature. The cavity of the uterus was swabbed out with the liquor ferri persulphatis. No constitutional disturbance followed the operation, nor was there any return of the hæmorrhage.

After recovery, the hæmorrhoids were destroyed by the treatment adopted by Professor Markoe, of New York, *i. e.*, the application of fuming nitric acid to their entire surface, every three or four days, until removed. The application is almost painless. It was deemed advisable to defer the operation for the restoration of the perineum until the patient's general health should be restored.

June 28.—Operation performed without the use of any anæsthetic, no unpleasant symptoms occurring during the after-treatment, and the patient left for the country, July 19th, cured.

Case 12.

Rupture complete, nine years' duration.—Cure.

Mrs. F——, aged thirty-one. In her first and only confinement, which occurred nine years before, the perineum was torn completely through, the child presenting breech first. For the last seven years she has worn a ball-pessary, to retain the uterus *in situ*.

The pessary was removed, rest in the recumbent position enjoined, and a strong solution of tannin in glycerine applied to the mucous membrane of the vagina daily. This treatment was continued for some weeks with success.

July 11, 1867.—Performed my usual operation, which was followed by some irritative fever, controlled readily, however, by opium. The deep sutures were removed on the third, and the superficial on the eleventh day. Union was perfect.

I met this lady eleven months after, when she informed me that she had suffered no inconvenience since the operation, and had enjoyed better health than for several years previous.

Case 13.

Complete rupture, and Fibrous tumor of left labia.

Mrs. A——, aged thirty-eight, came under my care September 8, 1867; has had three children; laceration occurred with the first child. The tumor in the labia was first noticed about three years before, and during the last eighteen months had increased rapidly. She had been told that rupture of the perineum could not be cured, and I was therefore consulted only in reference to the tumor, which had grown to be a source of great discomfort, being very large, and blocking up the entrance to the vagina. The tumor was removed with some difficulty, its attachments being strong and deep: the operation was attended with considerable venous hæmorrhage. It weighed nine and a half ounces.

Upon recovery, the patient, by my earnest recommendation, submitted to an operation for the restoration of the perineum, which was performed December 4, and attended with the usual success.

Case 14.

Complete rupture, with Prolapsus of the uterus, of seven years' duration.

Mrs. P——, aged forty; admitted into Columbia Hospital January 20, 1868, on the recommendation of Dr. Van Buren; mother of one child seven years of age. Since the birth of this child she has suffered from prolapsus of the uterus, and for the last five years the uterus and vagina have been external to the body, supported by a handkerchief passed round the loins. There was complete rupture of the perineum. The exposed mucous membrane had lost its characteristic appearance and was extensively ulcerated. The accompanying vagino-vesicocele had not been reduced for some years, and the bladder had become so irritable from the decomposition of retained urine that only a few drops could be tolerated above the amount accumulated in the *cul-de-sac*. When voided, it necessarily passed over the ulcerated surface, and caused extreme pain. It is difficult to conceive a condition more deplorable than that from which this poor woman was suffering.

The enormous capacity of the vagina would render any attempt to retain the uterus *in situ* by a pessary unsuccessful, and, after consultation.

it was decided to attempt a radical cure by a modification of "Sims's" operation. This was performed in the presence of Drs. N. Young, J. Eliot, T. Morgan, and the clinical class. An ellipse, six inches in length and four inches in width, was removed from the anterior portion of the vagina, together with the whole of the thickened tissue included within the limits. Interrupted sutures of silver wire were introduced, one-quarter of an inch apart, and the uterus returned within the pelvic cavity before the parts were brought in apposition. The patient was placed upon her back and the pelvis elevated, a pledget of raw cotton, soaked in glycerine and carbolic acid, introduced daily, and the urine drawn every six hours. No unpleasant symptom followed. The wires were removed on the fourteenth day, when it was found that every part had united by first intention.

On March 2d the operation for the restoration of the perineum was performed in the presence of the same gentlemen, and attended with complete success.

For about one year this woman suffered no inconvenience, but after that time the uterus began to descend, and made its appearance externally eighteen months after the first operation. She was admitted into the Howard Hospital, and Dr. Reyburn removed a further section from the vagina, which appears to have answered for the time being.

I am satisfied that many of these operations fail on account of the operator being too conservative, not removing sufficient amount of tissue, and leaving an hypertrophied cervix, which should always be removed if found irreducible by ordinary means. The perineum had remained intact.

Case 15.

Complete rupture, two months' standing.—Cure.

M. S——, admitted into Columbia Hospital January 24, 1868, upon the recommendation of Dr. N. Young; was confined with her first child two months previously, her labor having been very protracted, and finally terminated by forceps. An attempt had been made to restore the perineum, immediately after her labor, by the interrupted suture, but without success.

The usual operation for complete restoration was performed in presence of the clinical class on January 25. She was discharged, cured, February 27th.

This woman was confined with her second child, eleven months after leaving the hospital, without injury to the perineum.

Case 16.

Complete rupture, twenty-one years' duration.—Cure.

Mrs. N——, aged forty-seven; mother of eight children. Although the injury in this case occurred at the birth of her first child, and the inconvenience attending it had increased with each succeeding year, yet nothing beyond mere palliative measures had been suggested for her relief. The uterus had been retained *in situ* by the daily introduction of a sponge saturated with a strong decoction of white-oak bark. Her urine was voided only by catheter, which she had learned to introduce herself.

When placed under my charge, March 8, 1868, she was emaciated to an extreme degree, and anæmic, the irritability of her nervous system being so great that it was only after repeated attempts I succeeded in keeping her quiet long enough to make a sufficient examination to satisfy myself as to her condition.

The rupture of the perineum was complete, but uncomplicated with either prolapsus of the uterus or vaginal walls; this usual accompaniment, in cases of long-standing, having been prevented by the daily use of the medicated sponge-pessary.

It required some weeks of preparation before this patient was in a condition to permit of operative interference; but, by the free administration of cod-liver oil, strychnine, iron, and whisky, I succeeded in bringing her up to a point that warranted an attempt at radical cure.

June 8.—Assisted by Drs. Ashford and Eliot, I performed the usual operation. The deep sutures were removed on the third, and the superficial on the twelfth day; every portion having united by first intention. For three days after the operation this lady suffered from a continued series of hysterical paroxysms, which large doses of the bromide of potassium (one drachm every two hours) seemed inadequate to control. They ceased at last, apparently from sheer exhaustion.

The general nervous condition of this patient, accompanied by the necessity of constant catheterization, and an indisposition for the slightest exertion, which continued for some time after the operation, rendered the case most difficult of management.

August 13.—She left for the springs, not having been out of her house before for five years.

Case 17.

Incomplete rupture, two years' duration.—Cure.

N. S——, aged twenty-seven; has had three children; the first two born without any unusual difficulty; the last was the subject of a protracted labor, the breech presenting. Her convalescence was slow.

The laceration extended to within one-third of an inch of the sphincter, and the vaginal walls had commenced to yield to the pressure of the uterus. An operation was recommended at once, not on account of any immediate inconvenience, but to prevent the complications which would present in a short time, if the perineal support should not be restored.

The operation was performed on May 8, no anæsthetic being used; the deep and superficial sutures were removed at the usual time; and similar success attended this as had marked former cases.

Case 18.

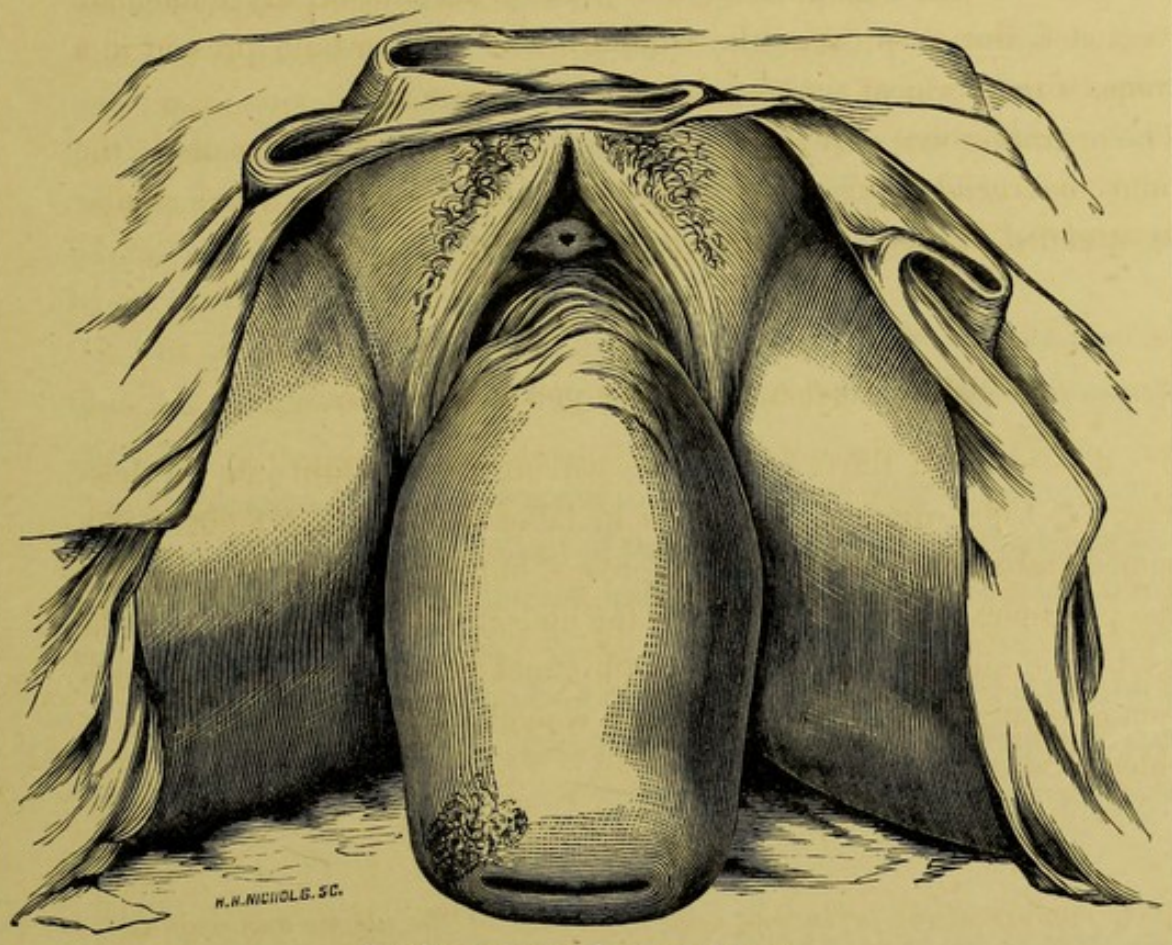
Complete rupture, immediate operation.—Cure.

Mrs. R——, aged thirty-two. This patient was brought into the hospital May 11, 1868, after she had been in labor for sixty-five hours. She was immediately delivered with the forceps, but, in spite of the greatest care, the perineum was torn through to the anus. The parts were brought together by the quill and interrupted suture, and united kindly; the wires were removed at the usual time; and her convalescence was as rapid as if no accident had occurred.

Case 19.

Complete rupture of the perineum, and Prolapsus of the uterus and vagina.

P. N——, aged forty; admitted into Columbia Hospital June 2, 1868. This woman stated that she had been for several years in the condition in which she presented herself at the hospital, unable to work for her support, and dependent upon the charities of the public. The entire vaginal walls were exterior to the body, and covered with scales of dried epithelium, abrasions, and ulcerations, there being no spot of healthy mucous membrane discoverable. The os uteri was patulous, the index-finger passing readily into the uterine cavity, and the whole organ very much hypertrophied. See Plate 3.



Complete prolapsus of uterus and vagina.

Before any operation for a radical cure could be attempted, it became necessary to restore the vaginal mucous membrane to a healthy condition. The procidentia was reduced with some difficulty, and the vagina kept thoroughly anointed by pledgets of raw cotton soaked in glycerine and watery extract of opium. This application not only served to restore the mucous membrane, but retained the uterus *in situ*.

This treatment, conjoined with a general tonic course, was continued for some weeks before the constitutional and local condition of the patient was sufficiently improved to permit of surgical interference.

July 3.—Patient, having been fully ætherized, was placed in the ordinary position for lithotomy, and Emmet's modification of "Sims's" operation for the radical cure of prolapsus uteri performed, the section being taken from the anterior wall of the vagina. The parts united perfectly, and were considered sufficiently contracted to retain the uterus in position when assisted by a restored perineum.

On the seventeenth day of the same month the usual perineal operation was performed, and on August 20th she left the hospital, apparently cured.

Dr. Ashford saw this woman about one year after the operation. She had been working steadily most of the time since she left the hospital. The perineum was strong and perfect, but the uterus found to be low down and resting upon the perineum.

The same mistake was made in this as in Case 14, and it will be necessary to amputate the cervix and remove another section from the posterior wall of the vagina to perfect the cure.

Case 20.

Complete rupture of the perineum, and Procedentia uteri of eleven years' standing. Cure.

Mrs. P——, aged fifty; admitted into Columbia Hospital July 11, 1868. The condition of the patient was similar to Case 14, but she had taken better care of herself. By frequent bathing and anointing the parts with fresh lard, she had succeeded in preventing the ulcerations and excoriations of the mucous membrane.

July 20.—The patient having been fully ætherized, the same operation was performed as in Case 14, but double the quantity of tissue removed,

the caliber having been reduced more than one-half. No constitutional disturbance followed. The wires were removed on the fourteenth day, when every part was found united.

August 5.—The usual operation for restoration of the perineum was performed in the presence of my clinical class. The deep wires were removed on the third, and the superficial on the eleventh day, union being perfect. Patient left the hospital, September 8, cured.

There is no probability of a return of the prolapsus in this case, for the contraction of the vagina was so perfect that the uterus could not descend, and, there being fully two and one-quarter inches of sound perineum, the maintenance of the vagina in its integrity was secured.

Case 21.

Complete rupture of the perineum, with Procidentia uteri, of twelve years' standing.—Cure.

Mrs. B——, aged sixty; admitted to Columbia Hospital July 27. The general condition of this patient was good. Her constitution had suffered little from the local trouble, probably owing to the absence of the periodical congestions attending the catamenia, the climacteric period having been reached at her forty-eighth year. The uterus was much enlarged from congestion due to malposition, not from any increase of its parenchyma. Reduction of the procidentia and rest in the recumbent position for a few days brought it down to nearly its normal dimensions.

The size of the vulvo-vaginal opening was enormous, and the restoration of a perineum, of ordinary dimensions, would have failed in retaining the uterus *in situ.* I therefore decided, with the consent of patient, to close the entire opening, leaving only a portion patent, the size of a goose-quill, for the escape of the secretions.

August 8.—The operation was performed in the presence of Drs. Young and Eliot, Dr. Ashford assisting. The mucous membrane was removed on either side to the extent of four inches, and of the same width as in the ordinary operation for restoration. Six deep sutures were used, and nine superficial. The wires were removed at the usual time, and union found to be perfect. She left the hospital, September 13, cured.

Case 22.

Complete rupture, Procidentia, and Vesico-vaginal fistula.—Cure.

Mrs. D——, aged thirty-eight; admitted to Columbia Hospital September 4, 1868, on the recommendation of Dr. L. Mackall, jr. She was the mother of three children, but, from her history, I could not learn in which of her confinements the rupture occurred, but that some months elapsed after the birth of her last child before she experienced any serious inconvenience. She then complained of a continuous pain in the lumbar region, and profuse leucorrhœa. After standing for a short time, or making any extra exertion, the uterus would protrude through the vulva.

Upon making her condition known to her family physician, he recommended the use of astringent injections, and adjusted a ring-pessary to retain the uterus, requesting her to return to his office in a few weeks to have the pessary removed. She, however, found herself relieved by the measures adopted, and did not see him again for more than one year. There had been no return of the prolapsus, but she complained that her urine constantly dribbled from her, and also of an offensive sanguineo-purulent discharge from the vagina. The pessary was removed, and ulceration found to have taken place through the walls of the vagina and bladder, at the lower portion of the neck, producing a vesico-vaginal fistula.

At the time of her admission to the hospital she was much emaciated and anæmic, and it was several weeks before any attempt was made to restore the integrity of the parts.

The first and second operations for the closure of the fistula were unsuccessful, owing to the unhealthy condition of the tissues, there being no attempt at union. On the third trial I determined to remove every portion of suspected tissue around the fistula, and, by so doing, increased the opening from one-quarter of an inch in its long diameter to one and one-eighth of an inch. The wires were removed on the tenth day, and union found to be perfect. After some weeks of rest she had gained strength and flesh, and I restored the perineum by the usual operation. The deep sutures were removed on the third, the superficial on the twelfth day.

November 28, she left the hospital, perfectly cured. I have frequently heard from this patient since then. She is enjoying good health, and has suffered no inconvenience from her former troubles.

Case 23.

Complete rupture, four years' standing.—Cured.

Mrs. B——, aged twenty-nine; admitted to Columbia Hospital August 8, 1868; mother of three children. The accident occurred at the birth of her last child, her labor having been very rapid, and the child's head and shoulders unusually large. She had applied for admission in March, but was at that time so extremely anæmic that no operation would have succeeded. I recommended her to wait a few months, and placed her upon a tonic and stimulating course of treatment. She improved rapidly, and at the time of her admission was in a good condition.

August 10.—The ordinary operation was performed in the presence of the class, Dr. Ashford, my first assistant, administering the anæsthetic. Everything progressed favorably; the sutures were removed at the usual time, and union found to be perfect. Patient left the hospital, September 11th, cured.

Case 24.

Complete rupture, Hæmorrhoids, and Prolapsus uteri.—Cure.

Mrs. S——, aged thirty-five; mother of six children; came under my care September 2, 1868; has been suffering for several years from hæmorrhoids, but during the last six months they have increased so much in size, and are attended with so much pain, as to disable her from engaging in her household duties.

It was for this difficulty she consulted me. Upon examination I discovered the ruptured perineum, and detected a horse-shoe pessary, which she said she had worn since 1862. I recommended, first, the removal of the hæmorrhoids, and, then, the restoration of the perineum; promising her she would be able to dispense with the pessary.

The hæmorrhoids were removed with a chain-écraseur, attended by the loss of not more than one ounce of blood. Three weeks afterward the perineum was restored by the usual operation. But little constitutional disturbance followed either operation. Patient made a rapid recovery, and was entirely relieved from pain or inconvenience.

I have seen her frequently since, and the cure appears to be permanent: the uterus is in its normal position and is disposed to stay there.

Case 25

Complete rupture, with Vaginal rectocele, of eleven years' duration.—Cure.

Mrs. R——, aged thirty-two; mother of one child; was placed under my care October 4, 1868. Her labor was tedious, and terminated by the forceps. The perineum was entirely gone, and she had a large rectocele; had worn a ball-pessary for some years.

A section was removed from the posterior wall of the vagina, which relieved the rectocele, and, after a full recovery from this operation, the cure was completed by restoring the perineum in the usual mode. She left for her home, December 20, cured.

Case 26.

Complete rupture, with Ulcers of rectum, five years' standing.

Mrs. D——, aged thirty-seven; admitted to Columbia Hospital, October 17, 1869. The general condition of the patient not good, but she was urgent for the operation, as she had left her family for that purpose and was anxious to return.

October 19.—Patient being fully ætherized, the ulcers in the rectum were freely divided, the sphincter being included in the division, and the usual operation for restoration was performed in the presence of the clinical class. There was much more hæmorrhage than usual, and some time elapsed before the parts could be brought together. Three deep sutures and six superficial were used.

October 21, 10 *a. m.*—Patient has had a severe rigor, lasting over half an hour, followed by heat of skin, thirst, and considerable pain in the head; pulse 120. There was no unusual inflammation or pain about the parts to account for these unpleasant symptoms. A full dose of opium was administered, and ordered to be repeated in six hours. At 9 p. m., skin moist, pulse 120, and small; no marked restlessness; ordered one ounce of brandy with each dose of the opium.

October 22, 10 *a. m.*—Patient bright and cheerful; less fever, pulse 118, soft; removed the deep sutures; parts very healthy.

8 *a. m.*—Has had another chill, more severe than the first, pulse 130 great restlessness; some cough, but not very troublesome; gave quinia, opium, and brandy in full doses.

October 23, 11 *a. m.*—Skin moist; tongue slightly furred; pulse 117. A careful examination was made to ascertain if any pus had formed in the track of the deep sutures, but none was found. She continued in much the same condition until the twenty-eighth, when the superficial sutures were removed, and, contrary to all reasonable expectations, there was perfect union.

From this time onward the cough was more troublesome, she had occasional rigors, temperature increased, pulse never below 120, great prostration, and all the well-marked symptoms of surgical fever. She died December 21, two months from the time of operation. No post-mortem was allowed.

The error committed in this case was operating upon a patient decidedly below par. If I had submitted her to a judicious course of medical treatment for some weeks at least before the operation, she might have been spared to her family, and I would have been saved the mortification of reporting a case which, in its general results, was a decided failure.

Case 27.

Complete rupture, Prolapsus of the rectum, three years' standing.—Cure.

Mrs. S——, aged thirty-seven; mother of four children. The rupture occurred at the birth of her last child, and was complete, extending through the sphincter. Whenever the bowels were moved, or the patient stood for a few minutes, the rectum would become prolapsed to the size of a large orange, and it was difficult to return it.

The treatment was directed to the restoration of the perineum and sphincter ani, being satisfied that the protrusion of the bowels was a natural consequence of the loss of support.

March 21, 1869.—I restored the perineum in the usual mode, but departed from my general practice in the after-treatment by keeping the bowels closed for sixteen days, in the mean time throwing into the rectum, twice daily, two ounces of a strong decoction of white-oak bark.

April 8.—The bowels were moved by one ounce of castor-oil; there was no extrusion of the rectum; and the perineum was perfectly sound.

I have seen this lady on two occasions since, and she assures me she has had no return of the difficulty.

Case 28.

Complete rupture, uncomplicated, five months' duration.—Cure.

F. E——, aged twenty-nine; mother of one child, five months old. The history of her labor, as obtained from herself, revealed nothing of unusual severity. Her attending physician had staid by her during the whole time, and, in her own language, "had rendered her every assistance in his power." Her convalescence was protracted, she being unable to move around for more than six weeks, and then could sit only with difficulty. No examination of the parts was made at the time, although she complained of extreme soreness. The symptoms from which she suffered when I first saw her were pain in the back, difficulty in passing water, and profuse leucorrhœa.

Examination revealed a rupture of the perineum down to the sphincter; the mucous membrane of the vagina was inflamed and unusually tender, its anterior wall bulging outward, dragging the bladder with it, thus accounting for the difficulty in micturition.

The vaginitis was reduced by the application of concentrated glycerine and aqueous extract of opium, and perfect rest. The general condition of the patient was anæmic, which condition was improved by the chalybeate tonics.

April 3, 1869.—An attempt was made to ætherize the patient, (Squibb's æther being employed,) but it was found impossible to bring her under the influence of the anæsthetic on account of the violent paroxysms of coughing which it produced. Chloroform was substituted for æther, and a few inhalations produced profound anæsthesia. The face became livid, respiration imperfect, pulse flagging, and, in a few seconds, imperceptible at the wrist, and but a feeble movement of the heart was discoverable by auscultation. Artificial respiration was resorted to, and continued for twenty minutes, before the breathing became fully established, and the imminent danger disappeared.

The operation was deferred until the following day, when it was performed without the administration of any anæsthetic.

April 5, 10 *a. m.*—Patient had passed a restless night, had not slept; she complained of headache, pain in the back, extending from the first dorsal vertebra to the sacrum; warm-water application was made to the vulva, and two grains of the aqueous extract of opium ordered to be administered every four hours; beef-tea diet.

4 *p. m.*—Patient had dozed a little, but was no better; pulse 120, and irritable; respiration hurried; the same treatment ordered to be continued; the opium to be administered every three hours.

10 *p. m.*—Complaint was made of stiffness about the neck, and inability to swallow without great and increasing effort. A close examination of the vulva was made; a little redness marked the points of entrance of the middle deep suture, and, upon touching the wire, it gave extreme pain, which was followed by a slight convulsive movement, tetanic in character. The wire was withdrawn, hot fomentations were applied, and twenty drops of Magendie's solution of morphine injected subcutaneously; the injection was repeated at 2 and 4 o'clock the next morning.

April 6, 10 *a. m.*—Several hours' sleep had been obtained during the night; pulse 110, and less irritable; skin hot, but not dry; respiration less hurried; the injection of morphine to be repeated, but reduced five drops; beef-essence to be administered by enema if the patient should be unable to swallow.

6 *p. m.*—A decided improvement in the general condition of the patient; had slept almost continuously since the morning visit, the last dose of morphine having been omitted on that account.

April 7, *noon.*—Pulse 90, and soft; respiration quiet and regular; a little stiffness about the muscles of the neck remaining, but all other unpleasant symptoms had disappeared; suspended the morphine, and ordered milk and beef-tea diet.

April 8.—Pulse 90, soft and compressible; wound looking healthy.

April 9.—Removed the deep wires, and found that every part of the apposed surfaces had united by first intention.

The patient continued to do well; the superficial wires were removed on the tenth day; and no further attendance was needed.

The alarming symptoms which supervened in this patient within twenty-four hours after the operation were undoubtedly due to the wounding of a branch of the pudic nerve by the needle carrying the wire, and, had the wire been allowed to remain, the patient would, in all probability, have died from tetanus.

Case 29.

Complete rupture, complicated with Laceration of recto-vaginal septum ; Prolapsus uteri and Urethral caruncle, eight months' standing.—Cure.

Mrs. D——, aged thirty; mother of one child. The general appearance of this woman was as unpromising for surgical interference as it could well be. She was pale, emaciated, and laboring under great mental depression. The passage of her urine was attended with agonizing pain; she was suffering from chronic diarrhœa, her passages being involuntary. The vulva and vagina were never free from fecal matter; the edges of the lacerated bowel had become ulcerated; the uterus was in a state of subinvolution, measuring five inches from os externum to fundus, and proportionately thick, the principal thickness being posteriorly.

The indications were, first, to improve the general condition of the patient by tonics, nourishing food and stimulants, arrest the diarrhœa, and remove the irritable caruncle. The caruncle was snipped off with scissors, and its base cauterized; pledgets of cotton, soaked in carbolized glycerine, were passed to the uterus daily, the ulcerated edges of the lacerations penciled with argenti nitras, and the following prescriptions ordered:

℞ Liquoris ferri pernitratis, gtt. v.
To be given, in one ounce of cream, three times daily.

℞ Ferri et quiniæ cit., gr. x.
To be given fifteen minutes after each meal.

This treatment was continued with but little variation for eleven weeks; the uterus reduced to three and one-quarter inches; the edges of the laceration and continuous tissue were healthy; the urine was voided without pain; and the diarrhœa had become entirely cured. The patient had gained considerable flesh, was in good spirits, and anxious that the operation should be performed that she might return home, but it was thought advisable to defer it a while longer.

June 17, 1869.—The patient, being in a satisfactory condition, was fully ætherized; the edges of the lacerated bowel were freely pared with scissors; and all suspected tissue removed. The parts were united by thirteen silver sutures. The perineum was then restored in the usual manner.

The deep sutures were removed on the third day, and those in the bowel

and the superficial ones on the tenth day, union by first intention resulting. It was some months before the sphincter ani fully recovered its power and control.

I have since delivered this woman of a child at full term, of ordinary proportions and weight. There was no rupture of the perineum at delivery.

This woman, prior to treatment, was unable to attend to her household duties, a burden to herself and her friends, but is now an active and useful member of society.

Case 30.

Complete rupture and extensive Laceration of the rectum, with loss of tissue from ulceration.—Duration, five months.—Cure.

Mrs. G——, aged twenty-three; very large and fat; capillary circulation sluggish. Her labor was severe, and protracted over three days; on the evening of the third day Dr. G. T. Elliot, of New York, was called in consultation, and delivered her with forceps. The brief history he gave me of the case is as follows:

"I found the patient exhausted, heart's action feeble, skin cold and bathed in sweat. The vulva was enormously swollen and discolored, and the surrounding tissues infiltrated with serum. I explained to the attending physician the alarming condition of the patient, the necessity for immediate relief, and the certainty of extensive laceration during delivery, on account of the condition of the tissues and the unusual smallness of the maternal outlet. The forceps were applied with difficulty, but finally locked, and in a few minutes the woman was delivered of a living male child, which weighed eleven pounds. Upon examination, I found the perineum and the whole anterior wall of the rectum split open, and the vagina dusky in hue. I feared extensive sloughing, and very much questioned the recovery of the patient; any attempt to bring the parts together by suture was out of the question; warm fomentations locally and free stimulation generally were ordered, and the case kept under observation."

Three months after her delivery she was brought to Washington, where she remained some six weeks before I saw her. I found the perineum entirely gone, the sphincter torn through, and considerable loss of the tissue of the recto-vaginal septum. After corresponding with Dr. Elliot, I recom-

mended an immediate operation, with a view to complete restoration of the parts.

May 29, 1869.—The patient declined the administration of any anæsthetic, and, being placed in position, the operation was proceeded with in the usual manner. Double elliptical flaps were made of the recto-vaginal tissue, and the edges kept in apposition by thirty-one sutures. One-inch quills, with two deep wires, were used for the perineum; the posterior attachments of the sphincter were freely divided on both sides; warm-water dressings were applied, and light diet ordered.

The operation lasted over three hours, during which not one word of complaint was uttered by my patient, nor was it in any way interfered with by restlessness on the part of the sufferer.

The deep perineal wires were removed on the third day; the superficial, and those from the rectum, on the fourteenth, when every portion was found to have united, and the entire operation proved a success.

No opium was administered to this patient, it being desirable to keep the bowels in a fluid state that no strain should be brought upon the parts by the passage of hard fecal matter until the adhesions should be firm and capable of resisting the pressure.

A repetition of this accident will undoubtedly occur if this lady should become pregnant again, and the pregnancy be allowed to run on to full term.

Case 31.

Complete rupture; immediate operation.—Cure.

Mrs. F. R——, aged twenty-two; admitted September 28, 1869; pregnant with her first child. This woman was of unusually fine muscular development, and in perfect health. Soon after labor commenced, I examined her, and found the presentation natural, the head engaged in the superior strait, the os well dilated, the parts soft, and pelvis unusually roomy. The perineum was fully two and one-half inches long, and very thick. The labor progressed rapidly; the pains were violent, and in quick succession; the contraction which brought the head in contact with the perineum was instantly followed by another more violent, which expelled the child's head and shoulders, carrying the perineum with it.

As soon as the placenta was delivered and the parts cleansed, I restored

the perineum in the usual manner. The deep wires were removed on the fourth day, and the superficial on the eleventh; union found to be perfect.

Patient discharged one month after delivery.

Case 32.

Complete rupture; Prolapsus of uterus, with Hypertrophy of the neck; five years' standing.—Cure.

Mrs. S. D——, aged thirty-five; mother of four children, the youngest five years of age. The accident occurred at the birth of the last child, which was delivered by turning.

Attention was first directed to the reduction of the hypertrophied cervix. The patient was kept in a recumbent position; hot-water injections were directed against the uterus three times daily, being continued on each occasion for fifteen minutes, after which pledgets of cotton, soaked in glycerine, were passed into the posterior *cul-de-sac*.

In the course of six weeks there was sufficient improvement to justify a recommendation of the operation for restoration of the perineum, which was performed November 17, 1869.

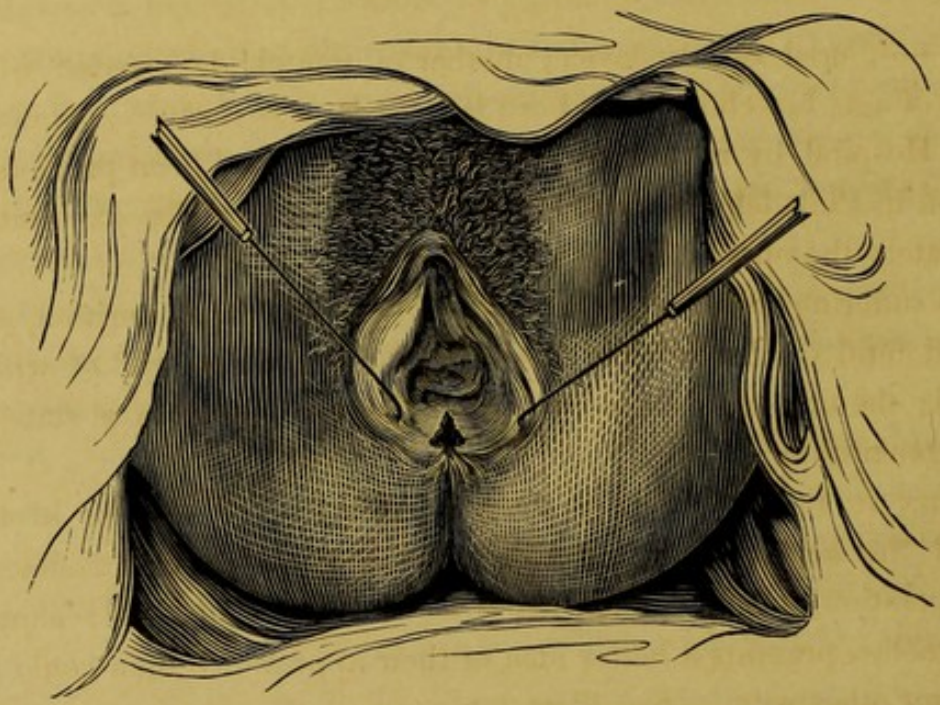
The patient was fully ætherized, and placed in the usual position. An unusual amount of hardened tissue had to be removed, and the hæmorrhage was very troublesome, but finally restrained by the application of ice. Four deep and five superficial sutures were inserted, the quills being two inches long. The sphincter was paralyzed by distension with the thumbs.

November 18.—The soft parts were so much swollen that the quills were cutting into the tissue. The patient complained of pulsating pain and extreme tenderness. About one dozen punctures were made with a sharp-pointed bistoury, from which the serum exuded freely; ice-water applications, renewed every five minutes, were continued during the day, and one grain of opium was administered every three hours.

November 19.—The œdema had subsided; there was less pain, and but little constitutional disturbance; cold-water applications were continued.

November 20.—The deep sutures were removed, and, contrary to expectation, there was no suppuration in the track of the wires.

November 28.—The superficial wires were removed, and the parts found perfectly united.



Complete rupture of perinæum through the sphincter ani, with laceration of the bowel. Case 33.

The occupation of this patient kept her almost constantly upon her feet. I therefore retained her in the hospital until December 22, to give the cicatrix an opportunity to become fully organized. I have frequently seen this woman since, and she informs me that she experiences no inconvenience from her old trouble.

Case 33.

Complete rupture through sphincters, and Sloughing of recto-vaginal septum; ten years' standing.—Cure.

Mrs. N——, aged twenty-seven; mother of one child; married when twelve years of age, her child being born before she was thirteen; admitted to Columbia Hospital by request of Dr. Palmer. She had been previously operated upon in Philadelphia, and kept confined to her bed for six months, but unfortunately the operation was a total failure.

She was suffering from incontinence of fæces, difficult micturition, and a profuse and fetid discharge from the vagina, the anterior wall of which was extended; the mucous follicles were hypertrophied, and in a state of ulcerative degeneration.

The injury in this case was so extreme that, by the consent of the patient, I had the accompanying drawing of the parts taken immediately before the operation, which, although not as clearly defined as I should desire, nevertheless presents a better idea of their appearance than could be obtained in any other way. (See Plate 4.)

The patient having been fully ætherized by my assistant, I proceeded to restore the recto-vaginal septum first. The edges of the laceration were so irregular that it was found necessary to sacrifice considerable of the sound tissue before they could be made sufficiently straight to be brought into perfect apposition; they were retained by seven sutures. The perineum was then restored in the usual manner, the posterior attachments of the sphincter having been freely divided on either side of the coccyx. Cold-water dressings were applied, and one grain of opium administered every few hours.

On the second day, there being a little too much swelling of the parts, the middle deep wire was removed from the perineum, and frequent injections of warm water, impregnated with carbolic acid, (three grains to the

ounce,) ordered to be thrown into the vagina. No untoward symptom was manifested during the after-treatment of this case.

Six weeks from the date of her admission the patient left the hospital, perfectly sound

Case 34.

Complete rupture; uncomplicated.

Mrs. B——, aged twenty-five. Five weeks since she was delivered of her first child, with forceps, but the physician who attended her assured me that he removed the instruments as soon as the head was well engaged in the inferior strait, and did not again apply them, but that the rupture was produced by violent uterine contractions, forcing the child through before the perineum had been dilated. The child was large, and the mother's pelvis small; the rupture was a natural consequence of the labor. I do not believe it could have been avoided. The attending physician was aware of the rupture at the time it occurred, and the mischief should have been repaired at once, instead of permitting the delay. This course would have saved the patient much suffering and annoyance, and prevented the necessity of paring the edges of the laceration, which I was compelled to do in this case.

March 18, 1870.—Operation performed in the usual manner; deep wires removed on the third day; superficial, on the thirteenth day; union perfect.

June, 1871.—This patient is again pregnant, and, as I believe it impossible for her to be delivered of a child at full term without again rupturing the perineum, I shall induce labor at the seventh month.

VESICO-VAGINAL AND RECTO-VAGINAL FISTULA.

While the profession is indebted to Baker Brown, of London, for simplifying the details of the operation for restoration of the perineum, suffering woman owes a debt of eternal gratitude to that illustrious American surgeon, Marion Sims, for discovering the means by which this serious, and, before his time, incurable, accident can be relieved. To him, and him alone, belongs the credit of applying silver sutures for the cure of this most distressing accident. All other surgeons who have made reputations in this particular branch of uterine surgery are merely imitators of this great man, of whom America may justly be proud, not only for discovering the means of curing vesico-vaginal fistula, (for prior to his operations there was no record of a single successful case,) but for the equally important discovery of the only means we possess of examining the vagina and uterus *in situ*—"the duck-bill speculum."

Believing that a history of this most important discovery in modern surgery would find a fitting place in this report, I make the following extract from Dr. Sims's address, delivered before the Academy of Medicine, New York:

"For the first ten years of my professional life the treatment of any disease peculiar to woman was ignored as far as possible. Surgery was my ambition, and it was gratified, for my head and heart and hands were full. This was due, not to any particular merit on my part, but to a fortunate position among a liberal and enlightened profession in the noble State of Alabama, a profession which, for intelligence and a chivalric *esprit de corps*, is not behind that of any other State in this great confederacy.

"Thus situated, a case of vesico-vaginal fistula was sent to me in July, 1845, which was investigated more because I had a surgical reputation to sustain than from any particular interest in the subject. It was, of course, dismissed as incurable. Two months after this another presented, which received a like verdict. Two cases in such quick succession, in a country town, at that time, formed an era in one's life. Imagine my surprise when,

a few weeks after this, a gentleman called to consult me about a third case. I told him promptly that it was useless to send her to me, as the injury was wholly incurable. He suggested that there was a possibility of my being mistaken in my ready diagnosis, when I replied that a leakage of urine following a protracted labor was an infallible sign of a vesical fistula. But my remonstrances were unavailing, for he sent her to town in spite of me.

"I investigated the case thoroughly, reading every author I could find on the subject, but to no purpose, for all was darkness and confusion; and thus I was on the eve of sending her home, when a little incident occurred that formed the turning-point of my professional career, and without which the discovery that has engaged our attention to-night would not have been made.

"A lady was riding in the suburbs of the city of Montgomery, Alabama; her pony, taking fright, jumped suddenly, when she fell to the ground, striking on the sacrum. I saw her soon afterward; her sufferings were extreme, as she had rectal and vesical tenesmus from a sudden retroversion of the uterus. To replace the dislocated organ was the indication of relief. Following the teachings of learned professors, the patient (covered with a sheet) was placed on the knees, with the pelvis elevated and the thorax depressed, when, by manipulation through the vagina and rectum, I hoped to replace it. Introducing the right forefinger into the vagina, but, remembering how a nervous gentleman had suffered a few days before from a rectal examination, I concluded not to subject this lady to the same disagreeable operation, particularly as it seemed possible to overcome the difficulty if my finger was only a little longer. My middle finger is more than half an inch longer than the index, but it could not be used without its fellow; and thus the two were passed, and in a few seconds I could not touch the uterus, or even the walls of the vagina, and the fingers were swept round, as it were, 'in empty nothingness,' which was to me, at the moment, a most puzzling mystery, and, while I was endeavoring to unravel it, my patient exclaims, 'Oh, doctor, I am relieved!' My office was ended, for my mission was to relieve her, but how it was done I could not understand. While I stood doubting and wondering, my patient, now easy, threw herself down on her side, producing thereby a sudden escapement of air from the vagina; and thus the whole mystery of the accidental reduction of the dislocated uterus was explained on the principle of atmospheric pressure.

"And what was its *rationale?* When the patient was in the position described, there being a natural tendency of the pelvic viscera to gravitate toward the epigastric region, it would require no great *vis a tergo* to produce the desired result in a recent case of this kind. One finger, however, was not long enough to throw the organ up, nor were the two; but when they were both introduced, in my varying manipulations and strenuous efforts, the hand was accidentally turned with its palm downward, which thus brought the broad dorsal surface of the two parallel fingers in contact with the vulvæ commissure, thereby elevating the perineum and expanding the sphincter muscle, which allowed the air to rush into the vagina under the palmar surface of the fingers, where, by its mechanical pressure of fifteen pounds to the square inch, this canal was dilated like a balloon, and the uterus replaced by its pressure alone. This accident—THERE ARE NO ACCIDENTS IN THE PROVIDENCE OF GOD!—this incident, then, occurred just at the right time. Had it happened six months sooner, its importance would not have been duly appreciated. Had it been six days later, the golden opportunity for its practical application would have been lost forever; for my mind had been sorely perplexed by the obscurity surrounding the investigation of the cases before alluded to, and I said to myself: 'If, by this position, the atmospheric air can be made to dilate the vagina to such an extent, even with a force strong enough to reduce a dislocated uterus, why will not the same principle allow me to explore this region, and examine accurately any injury or disease to which it may be liable?' Full of the thought, I hurried home, and the patient, (with vesico-vaginal fistula,) who was to have left on the next day, was placed in the position described, with an assistant on each side to elevate and retract the nates. I cannot, nor is it needful to, describe my emotions, when the air rushed in and dilated the vagina to its greatest capacity, whereby its whole surface was seen at one view, for the first time, by any mortal man. With this sudden flash of light, with the fistulous opening seen in its proper relations, seemingly without any appreciable process of ratiocination, all the principles of the operation were presented to my mind as clearly as at this time. And thus in a moment, in the twinkling of an eye, new hopes and new aspirations filled my soul; for a flood of dazzling light had suddenly burst upon my enraptured vision, and I saw in the distance the great and glorious triumph that awaited determined and persevering effort. From this

moment, my high resolve was taken; nor did I think or care for the personal sacrifices I should have to make. I thought only of relieving the loveliest of all God's creation of one of the most loathsome maladies that can possibly befall poor human nature; and in this I honestly confess that I was stimulated by feelings of national pride, as well as by a desire to advance our glorious profession. Full of sympathy and enthusiasm, thus all at once I found myself running headlong after the very class of sufferers that I had, all my professional life, most studiously avoided. Ransacking the country around, my medical brethren soon discovered and placed at my disposal some seven or eight cases of vesico-vaginal fistula that had been quietly laid up as incurable. Building a little hospital as a special field of experiment, I readily got control of these cases, all of them healthy young negro women; promising to perform no operation that would endanger life or render their condition any worse. Having no proper instruments and no instrument-maker, dentists, jewelers, and blacksmiths were laid under contribution, and soon such rude instruments were made as were suggested by the peculiar wants of individual cases. This occupied a period from the 9th of December, 1845, to the 10th of January, 1846, when the first operation was performed.

"Several medical friends, among whom were Drs. Boling, Holt, Ames, Baldwin, Jones, McWhorter, and Henry, were invited to the inauguration of the experimental series. When the mechanical contrivances were exhibited, the peculiarities of each case pointed out, and the principles of the operation explained, they thought my plan of procedure promised well, while some were but little less enthusiastic than myself in hopes for the future.

"The first was a very simple case, and one that any tyro in surgery could now cure in a week's time. The fistula was an inch and one-quarter long, transverse, in the base of the bladder, with an abundance of tissue. Its edges were accurately adjusted, and I expected to effect at once a magical cure; but, greatly to my surprise and mortification, it was a failure. However, the size of the opening was reduced from that to one not larger than a No. 4 bougie; this encouraged me considerably, and the same operation was tried on another case with a like unfortunate result, and after this, with various and constantly-varied modifications on others, till each one had suffered numerous operations, but all to no purpose. And thus I worked on,

not for weeks and months, but for long weary years, before a single case was cured. My repeated failures brought a degree of anguish that I cannot now depict, even were it desirable. All my spare time was given to the development of a single idea, the seemingly visionary one of curing this sad affliction, which not unfrequently follows the fulfillment of the law pronounced by an offended God, when he said to the woman: 'In sorrow and suffering shalt thou bring forth children.'

"Soon my friends began to despair of my efforts, and, one by one, became tired of such profitless work. At last Dr. B. R. Jones, my partner, an accomplished physician, who had stood firmly by, giving his valuable advice and assistance, importuned me to cease my efforts; thus opposed at home, and deserted by the professional brethren who once cheered me on by their personal presence, I now stood alone—alone, did I say? no! I was not alone; for I felt that I had a mission, if not of a divine character, at least, but little short of it, of divine origin. I felt that the God who had called me to this good work, and inspired me with new views for its accomplishment, was with me, and would not desert me. I could not have ceased my labors if I had tried, for something told me that the fullness of time had arrived, that the work had to be done, and that, if I should fall, God, in his wisdom, would raise up some one as an instrument to carry it forward to a glorious consummation. I was not alone, then; nor was I alone in another sense, for I had succeeded in infusing my own courage and enthusiasm into the hearts of the half dozen sufferers who looked to me for help, and implored me to repeat operations so tedious, and, at that time, often so painful, that none but a woman could have borne them.

"To the indomitable courage of these long-suffering women, more than to any other single circumstance, is the world indebted for the results of these persevering efforts. Had they faltered, then would woman have continued to suffer from the dreadful injuries produced by protracted parturition, and then should the broad domain of surgery not have known one of the most useful improvements that shall forever hereafter grace its annals.

"In my first experiments the quilled suture was used, securing the ligatures by passing them through little canulæ that projected from the vulva. The canulæ were firmly soldered to the proximal quill, and, when the ligatures were tightened and wrapped round the end that projected from the vagina, the fistulous edges were neatly coaptated by the quills. This is

introduced merely to show the slow degrees by which practical truths are sometimes developed. After using this machine, variously modified, for nearly three years, giving attention mostly to the perfection of the self-retaining catheter, I at last concluded that the projecting canulæ were a chief cause of failure, and consequently determined to dispense with them. But how to secure the ligatures was the question. A detail of the numberless expedients resorted to is useless; suffice it to say that I was at last driven completely to the wall. I had resolved never to repeat another operation till I had devised some plan of fastening the quill suture without the canulæ; of tying a knot where I could not reach it with the fingers. Thus my brain was sorely puzzled; I had not performed an operation for nearly six weeks, and my devoted patients were begging me, from day to day, to 'try only one more time.' Notwithstanding their importunities, I had determined, first, to invent a knot for my sutures; but it seemed that my usual readiness of expedient had now deserted me. My brain was oppressed; my heart was heavy; but never for one moment did I despair of eventual success. At last I happened to remember that, when a boy, I used to make sinkers to my fishing-lines by cutting a shot half in two, laying the line in the cut, and then compressing the shot on it with my teeth. I cannot express the delight that filled my heart at this simple suggestion. The idea occurred to me on the night of the 14th November, 1848. The contemplation of its beauty, simplicity, and perfect adaptation to the purpose gave me a sleepless night; for there I lay, with etherealized brain, performing in imagination a magical cure on each of my devoted patients. This was, as I thought, the consummation of all my plans. After a struggle for three years, victory was about to crown my efforts. How I longed for the morning, that I might put to the test of experiment what seemed so beautiful in theory! But I was doomed to wait another twenty-four hours before proving my principle; for, just as I was preparing for the operation, a call to the country appropriated the day, and thus the longest day of my life was lengthened out by hope deferred. But, bright and early on the succeeding morning, I applied the quill suture secured by the perforated shot. It was all I could desire. I was never so well satisfied with any operation in all my life. How anxiously I waited for its results! I had at last gotten rid of the canulæ that had so long been such a serious obstacle to success, and everything was propitious; but these bright hopes were of short duration, for I soon had

unmistakable evidence that the operation was a total failure. What was the cause of it? 'Why,' said I, 'it must be because the silver quills are too large.' So I began to lessen their size, till they were not more than a line in diameter, and, on account of the expense of silver, lead was substituted; but, notwithstanding these modifications, there was no more success than at the beginning. What now was to be done? The principles of the operation were clear, and its mechanism seemed to be perfect. At first I had supposed my failures were due to the imperfection of the catheter; that was perfected; and then I laid the blame on the method of securing the sutures by means of the canulæ; they were replaced by the perforated shot; and then I looked to the size of the quills, and reduced them, so that they burrowed nicely in the tissues. It then seemed that success was inevitable; but still disappointment awaited me at every turn.

"Thus far, all my experiments were conducted on the principles of a rational inductive philosophy. The operation was mechanically perfect, but with no better results than when it was rude and clumsy. There must be a reason for all this; what was it? 'Why,' said I, 'perhaps it is in the nature of the material more than in its principle of action.' What a happy thought! Of course it was, for a silk thread, introduced under the skin, and allowed to remain a week, becomes a seton, giving rise to the suppurative process, and certainly the same thing must occur with it in the vagina; and how, then, could there be cohesive union? Here, then, was the difficulty at last; how strange it now seemed to me that this fact had not long ago forced itself upon my mind. Now the question arose, 'Was there a substitute for silk that would answer the same purpose, and yet not poison the animal tissue?' Why, lead remains indefinitely in the body, becomes sacculated, and produces no poisonous or suppurative effect. Dr. Levert, of Mobile, had demonstrated the innocuousness and efficiency of leaden ligatures on the arteries in the lower animals, and Mettauer and Dieffenbach had actually used leaden sutures in these very cases; and I had, in my various experiments, tried them in two cases of vesical and one of rectal fistula; but, fortunately for science, the clumsy leaden wire was unsuccessful in my hands. Was there any other metal that could be substituted for lead, possessing its valuable property of harmlessness?

"In this train of inquiry, what would be more readily suggested to the reasoning mind than silver, gold, and platinum? Just at this stage of affairs

I happened to pick up a piece of brass wire that had been used in a pair of old-fashioned suspenders, made before the days of India-rubber; it was as fine as ordinary sewing-thread. I took it to a jeweler, who imitated it in silver. I was now quite as anxious to see the result of an experiment with this as I was, seven months before, to see the perforated shot applied. On the 21st of June, 1849, it was done. A young colored woman, who had never murmured at the preceding failures, was placed on the operating-table for the thirtieth time, and the silver sutures were applied, with the leaden bars and the perforated shot. In all previous operations the urethra, in a day or two, would become red and tender, and the urine loaded with thick, tenacious mucus, thus showing the inflammatory process, which was adverse to union; but, after this operation, the urine remained perfectly limpid all the time, and on the eighth day the parts were perfectly healed; the suture apparatus remaining just as it was placed, with the cross-bars somewhat burrowed in the vaginal tissue.

"I shall not dwell upon my feelings at this time. At last I had attained for what I had worked nearly four years; and it was but a few weeks before all the cases were cured that had been the subject of experiment for so long a time. I was anxious to get a few more cases, to settle some doubtful points, before publishing to the world my discovery; but, unfortunately, with the realization of my dreams, and in the full fruition of my most sanguine hopes, came a sad reverse. An exacting practice, and the extreme mental tension of the past four years, had produced a collapse, long foreseen by friends, without my consciousness of its approach. Having contracted the chronic disease of a warm climate, which is almost universally fatal, and struggled hard for more than two years, and, as it seemed, hopelessly, against my fate, thus seeing that death was inevitable, and fearing that I might die without the world's reaping the benefit of my labors, I determined to give my experience, crude as it was, to the profession that I loved so much. And, accordingly, in October, 1851, my paper 'On Vesico-vaginal Fistula' was dictated, and sent to Dr. Isaac Hays, of Philadelphia, who published it in the American Journal of Medical Sciences for January, 1852, as my last free-will offering on the altar of science. I little thought of living to see it in print; but it has pleased an all-wise God to restore me again to health, and, by a mysterious providence, to place me in your midst, where I have found naught but friends and kindness."

It is quite true that, long before Sims's time, many eminent surgeons attempted the cure of this *opprobrium chirurgiæ*, but without success. The much-vaunted method of Metzler was pretty in theory only, and I believe, with Vidal de Cassis, that there did not exist in the science of surgery a well-authenticated complete cure of vesico-vaginal fistula prior to Sims's publication of his method.

Velpeau, in 1839, thus speaks of the cure of these fistulas: "To abrade the borders of an opening, when we do not know where to grasp them; to shut it up by means of needles and thread, when we have no point apparently to secure them; to act upon a movable partition placed between two cavities, hidden from our sight, and upon which we can scarcely find any purchase, seems to be calculated to have no other result than to cause unnecessary suffering to the patient."

In the hands of skillful surgeons the operation for the cure of vaginal fistula is now so generally successful that but little importance is attached to ordinary cases. I therefore omit simple fistulas from this report, and confine myself to cases of unusual interest.

Mary W——, aged twenty-four, admitted to Columbia Hospital, October 20, 1870; mother of one child, two years of age, of which she was delivered by forceps. She was confined to her bed for several months after delivery, and has been an invalid ever since.

Examination revealed a vesico-utero-vaginal fistula, occupying the whole of the anterior *cul-de-sac*, or, it would be more correct to say, a series of vesico-vaginal fistulas, as the whole anterior wall of the vagina was cribriform with them.

The vaginal tissue of the anterior *cul-de-sac* had sloughed away, as, also, a large portion of the base of the bladder. The reflection of the peritoneum between the bladder and uterus was distinctly visible, but had lost its characteristic appearance and looked more like parchment than peritoneal tissue. The neck of the uterus had been torn open beyond the internal os. The cribriform condition of the anterior wall of the vagina had not been occasioned by the burrowing of the urine in the cellular tissue; for both of the openings communicated with the bladder, and were independent of each other.

When the patient was in a prone position, the urine flowed almost directly into the uterus, but little passing into the lower portion of the bladder; but, when standing, it ran from her continuously. She had been the

subject of several operations, all of which had been unsuccessful, and she was finally sent by her attending physician to Dr. Thomas Miller, of this city, who placed her in my charge.

Fig. 1, Plate 5, gives a representation of the appearance of the vagina when examined by the Sims speculum, the neck being split and turned up, to show the rent in its posterior lip.

Fig. 2, Plate 5, shows the same, with the os *in situ;* the dotted lines show the margin of the incisions.

The loss of tissue had been so great that it was impossible to succeed with any ordinary plastic operation. The injury to the uterus was extensive, and, involving the body, as it did, rendered operative interference extremely hazardous, threatening metritis as the result of an attempt to restore its integrity. Peritonitis was little to be feared, on account of the altered condition of that membrane.

Upon consultation with Drs. Miller and Eliot, it was decided to pare the edges of the uterine flaps, and bring the parts together by silver wires and clamps. The patient having been placed under the influence of æther, the ragged edges of the flaps were cut off with strong scissors, and the edges approximated and retained in apposition by six silver wires passed through silver quills. These were allowed to remain for ten days, and when removed the parts were found united perfectly. No metritis or constitutional trouble of any kind followed the operation, and not a grain of opium was administered during the period of recovery.

On the second day after the removal of the wires her menses appeared, and two weeks were allowed to elapse before any further operation was attempted.

The patient's condition was fully explained to her, the probable reasons given for the former failures, and the option offered her of remaining as she then was, or of submitting to an operation which would turn the neck of the uterus into the bladder, and convert the vagina into a blind *cul-de-sac.* After consultation with her husband, she consented to the proposed operation, with a full knowledge of its effect upon her marital relations.

December 23.—The patient having been fully ætherized, assisted by Drs. Miller, Ashford, and Barker, I proceeded to remove a strip of the vaginal membrane one-quarter of an inch wide, starting at a point immediately behind the sphincter of the bladder, and sweeping upward along

Fig. 1.

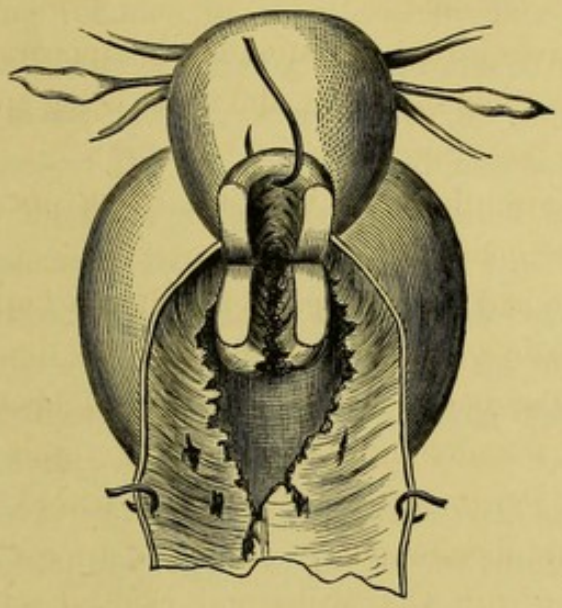
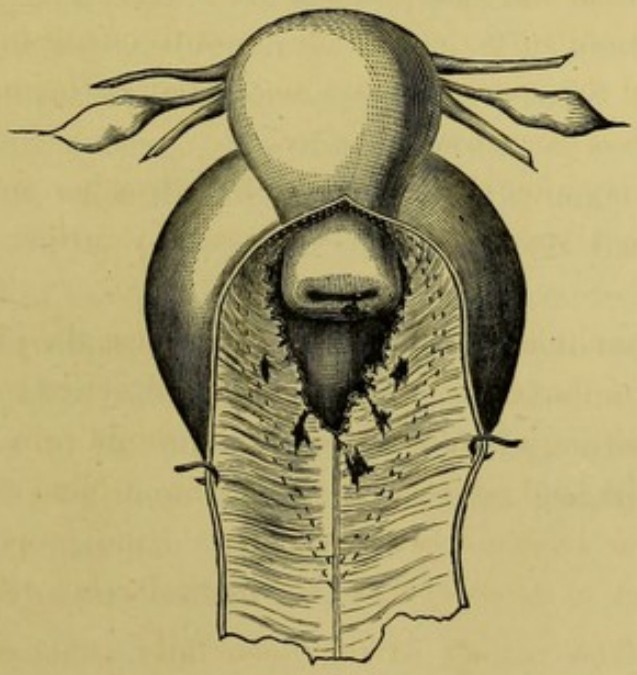


Fig. 2.







the lateral wall of the vagina, around the posterior *cul-de-sac*, and down the opposite side to the point of starting. The raw surfaces were accurately adjusted, and retained in apposition by thirty-two silver sutures; the self-retaining hard-rubber catheter was introduced, and the patient placed on her back. A small opening was left at the point where the incision started for the escape of the urine that would necessarily find its way into the sac formed by the folds of the vagina included in the operation. The after-treatment consisted of frequent injections of tepid water into the vagina, followed by the carbolized glycerine. Two capsules of the balsam of copaiva were given three times daily, in order to render the urine bland and unirritating. No acceleration of pulse, or constitutional disturbance of any kind, followed the operation.

January 6, 1871.—The wires were removed, and the surface found firmly united except in the region of the lowest sutures, at which point the union was imperfect.

February 3.—The woman being anxious to return home, an attempt was made to close the remaining fistulous opening, but it totally failed, owing to the thickened and otherwise unhealthy condition of the tissues. Pledgets of cotton soaked in glycerine were introduced into the vagina every six hours, the catheter placed in the bladder, and the patient kept on her left side. Little urine passed through the fistula. This treatment was continued until March 25th, when, the parts appearing healthy, another attempt was made to close this opening. Six sutures were used, and allowed to remain in until April 7th, when they were removed, and union found to be perfect.

April 25.—In the presence of Drs. Miller and Barker the hydrostatic test was applied to the bladder, but no leakage occurred. This patient was kept under observation until May 17, when the same test was again applied, in the presence of a part of my clinical class. Iodine water was injected into the bladder to its fullest capacity, and the vagina was swabbed out with thin starch; by these means the slightest leakage would have been visible, but every part was found tight.

May 22.—Patient dismissed, cured.

VESICO-VAGINAL FISTULA, AND ENTIRE LOSS OF URETHRA.

Mary W——, aged twenty-seven; admitted to Columbia Hospital, March 12, 1871; mother of one child four years of age; her labor was very protracted, and finally terminated with instruments.

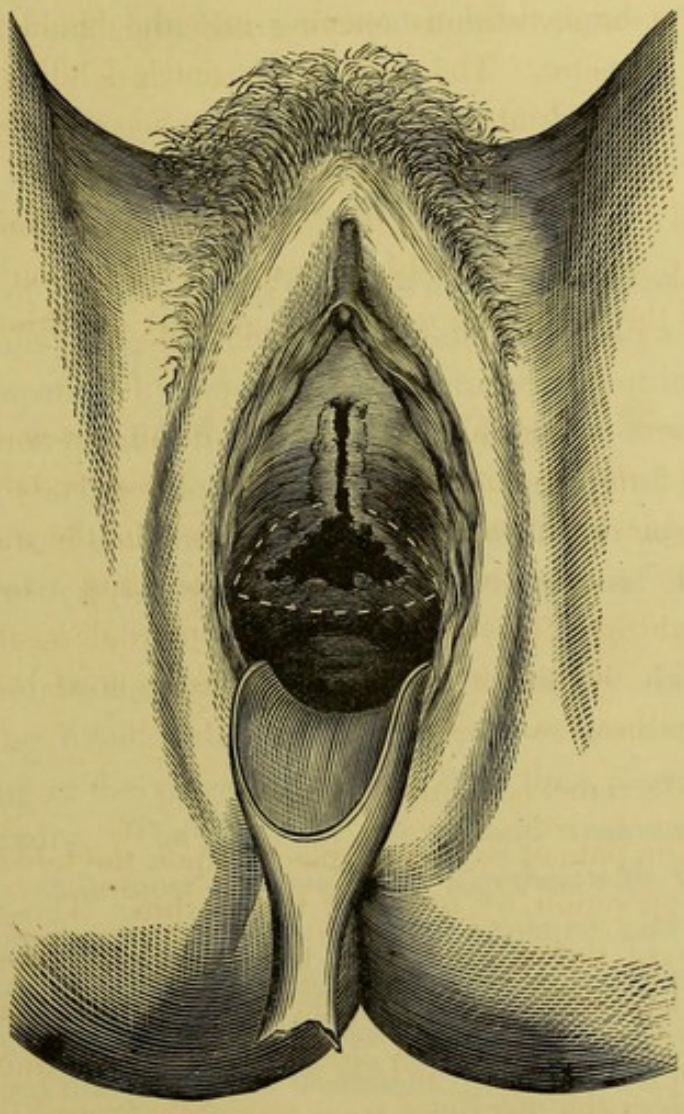
Examination showed absence of the urethra, which had been destroyed by sloughing, and a large fistulous opening into the bladder at its neck, about one inch in diameter. The patient was much debilitated, and in no condition to invite surgical interference. She was accordingly placed upon tonics, stimulants, and the most nourishing diet. Under this treatment she gained flesh rapidly, and her strength increased. By the middle of June she was sufficiently restored to health to justify an operation for her relief.

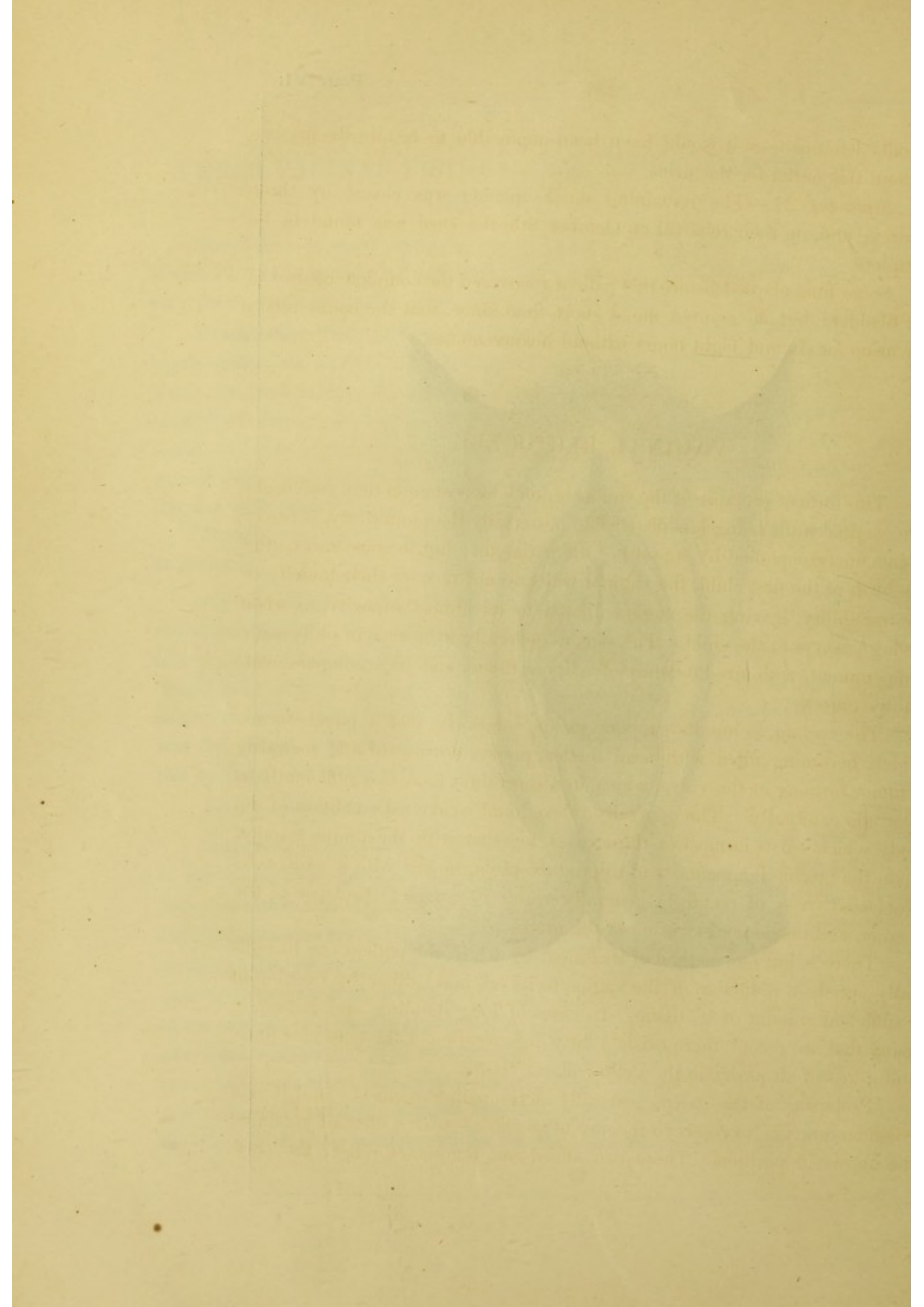
Plate 6, shows the site of the fistula and general condition of the parts at the time.

June 20.—Patient being fully ætherized, a clean cut was made along the upper margin of the opening, the edge being strongly beveled; a strip of membrane one-quarter of an inch wide removed in the direction of the dotted lines, and the parts were accurately adjusted and retained in apposition by twelve sutures. The point where the internal meatus should be was left patent, with the tissue in excess; the urine flowed freely through this opening. No catheter was required.

July 3.—Sutures removed; union perfect.

August 12.—The patient was again placed upon the table, with a view of continuing the operation by restoring the urethra. The mucous membrane on either side of the urethral track was loose and abundant, and no difficulty was experienced in securing a sufficiency for the formation of a new urethra. The edges were denuded on either side of the old track, about one-quarter of an inch from the margin of what originally formed the upper part of the urethra, and closely approximated over an elastic catheter, which was afterward withdrawn. The sutures were closely applied, No. 29 wire being used, and were allowed to remain fifteen days. Upon their removal every part was found united. A small fistulous opening now remained between the base of the new urethra and the bladder; this part having been inten-





tionally left open, as it would have been impossible to restore the urethra without this outlet for the urine.

September 27.—The remaining small opening was closed by three sutures; and, on their removal on October 8th, the cure was found to be complete.

Some time elapsed before this patient recovered the complete control of her bladder; but she assured me, a short time since, that she could retain her urine for six and eight hours without inconvenience.

VAGINAL RECTOCELE.

This form of prolapse of the vagina is much less common than vesicocele. The vaginal walls being less distensible posteriorly than anteriorly, it rarely occurs unaccompanied by rupture of the perineum; but in some cases, after the birth of the first child, the vaginal walls do not recover their tonicity or contractibility, leaving the vagina dilated to its utmost capacity, as when giving passage to the child. This occurs generally in women of phlegmatic temperament, with a redundancy of adipose tissue, and its accompaniment, flabby muscle.

The rectum, losing its support, yields anteriorly, and a pouch forms, which, becoming filled with fecal matter, presses downward and forward; a tumor forming at the vulva, which, in a short time, increases sufficiently to protrude externally. The generally relaxed and weakened condition of the body which exists in most of these cases, together with the undue traction upon the uterine ligaments, tend to produce prolapse, and with it vesicocele. Neglected cases of rectocele generally result in complete prolapse of the vagina, and necessary extrusion of the uterus.

There is but one method of treatment by which the patient can be radically cured—a reduction of the vagina to its original caliber by excision of a sufficient amount of its tissue. In cases of long standing, and, indeed, in many that are recent, there exists a fatty degeneration of the muscular fibre, and a loss of all power in the yellow elastic tissue.

Prolapsus of the uterus generally accompanies rectocele, and it is a common practice to resort to the use of pessaries, with a view of retaining the uterus in position. These can afford but temporary relief; the parts

soon become intolerant of their presence, or, if retained, they frequently complicate the difficulty by producing metritis or vesico-vaginal fistula. In the hands of the most skillful, with the most careful adjustment, they are abominations which should be banished from use as rapidly as possible, tending, as they do, to produce far more injury, and to increase the suffering of the patient. This idea of building a scaffold inside the vagina for the support of the uterus is contrary to common sense, in opposition to good surgery, and the theory advanced by those who advocate the use of the pessary is untenable, not being based upon sound philosophical principle. *Astringent* injections are of little service. Acting principally upon the mucus of the vagina, their force is expended in its coagulation, no change being produced in the sub-mucous tissues, which are the parts affected.

The details of the operation for the radical cure of this difficulty depend in a great measure upon whether or not the rectocele has become complicated with prolapsus uteri. In simple rectocele, an oval piece of the vaginal wall is dissected from its cellular attachments, the whole thickness of the tissues being removed. The extent of the ablated part must depend upon the redundancy of the tissue. Enough must be removed to reduce the caliber of the vagina to its normal size when the edges are approximated.

The dissection must be made with great care, for fear of wounding the bowel. The method I adopt is as follows: The patient having been placed in the position for lithotomy, and brought under the influence of an anæsthetic, an incision is made through the whole thickness of the vaginal wall to the cellular tissue connecting it with the rectum. A steel dilator is then introduced through the opening, and, by pressing the handles, the blades open, gradually separating the rectum from the vagina to the extent desired. This method of dissection is preferable to the knife, it being bloodless, and, if carefully practiced, without danger. I am indebted to my friend, Dr. Thomas, of New York, for the idea. The instrument is similar in construction to an ordinary glove-stretcher.

The part to be removed having been thus separated from its deep attachments, a pair of strong, blunt-pointed scissors are introduced, and the flap cut out. A separated margin of at least one-quarter of an inch should be left for adhesion, which, when united, forms a raphe, and adds materially to the strength of the part. The sutures are introduced at spaces of one-eighth of an inch, and are carried back so as to include the whole of the margin that

has been separated. Great care must be taken in the adjustment of the parts; the approximation must be perfect, or the operation will be a failure.

The sphincter ani should be paralyzed in the same way as recommended in restoration of the perineum, and the bowels kept loose.

The wires are removed from the twelfth to the fifteenth day. The vagina must be frequently washed out with tepid water, and a little carbolized glycerine thrown in after each injection. This operation is simple, and, if properly performed, in cases of uncomplicated rectocele, is always successful.

The method adopted by Dr. Sims, and modified by Dr. Emmet, is rarely successful. It consists in removing a strip of the mucous membrane, about one-quarter of an inch wide, on the margin of the tissue to be included in the sutures, leaving the deep tissues intact. A fold of the hypertrophied tissues of the vaginal wall is thus left behind the cicatrix, which forms a pouch in which is contained the natural secretion of the included membrane. Dr. Sims again modified his operation by denuding the vaginal epithelium to the whole extent to be included within the sutures. This was no improvement. It left the deep tissue simply folded up, and, instead of including within the fold healthy mucous membrane, there was left a raw surface that could not be brought in apposition, and which was frequently the seat of suppurative inflammation, forming an abscess, producing great constitutional disturbance, and rendering the operation a failure. In addition to these objections, in the latter modification the patient loses too much blood.

The substantial difference between Dr. Sims's operation and my own is this: He takes in a thick fold of the hypertrophied membranes, and tries to hold them by the adhesion of about one-quarter of an inch of mucous membrane. I cut out the whole of the membranes in excess, and unite the edges by the entire thickness of the tissues, making a strong, firm cicatrix, which forms a raphe, and gives increased support to the uterus. In private practice I performed several operations after Sims's method, but none of them were successful. The union, when union did take place, gave way early, and the rectocele re-appeared; but, in the majority of cases, I failed in securing union, the sutures cutting out on the fifth or sixth day. In hospital practice, where I have operated by the entire removal of the whole of the tissues, and in private practice, since I have adopted this method, I have met with no failures.

Case 1.

Vaginal rectocele.

Mrs. R——, aged thirty-seven; married; admitted to hospital June 6, 1867; has had several children, the youngest three years of age; has been troubled with constipation for the last twelve years, rarely having an operation from her bowels unless under the influence of a cathartic. Her perineum was ruptured during the birth of her first child, but the rupture increased with the third, which was unusually large, weighing thirteen pounds. From the history of this labor, as given by herself, the head of the child remained in the inferior strait for several hours, and was finally delivered by forceps. From that time a tumor was apparent at the vulva, which had gradually increased until the time of her admission. When her bowels were moved, she had to push the tumor up into the vagina and hold it there during defecation. The uterus was not prolapsed, but dragged low down by the weight of the posterior wall of the vagina. The tissues were very thick, and the mucous membrane was dry and covered with horny epithelium; the perineum was torn down to, but did not involve, the sphincter. The vagina was plugged loosely with cotton saturated with carbolized glycerine; the bowels emptied daily by an injection; and the patient kept in a reclining position, the object being to reduce the congestion of the membranes, and get them into a condition that would permit of union by first intention.

July 3.—Patient having been fully ætherized and placed in the position for lithotomy, an incision was made in the shape of an ellipse, starting from the posterior *cul-de-sac* superiorly, and terminating about one inch above the internal sphincter, its width at the center being five inches. The incision was made through the entire thickness of the vaginal tissue, exposing the wall of the rectum. The dissection of the flap thus formed was made mainly by the handle of the scalpel. The cellular tissue was loose, and the parts were easily separated. The bowel was kept back by a retractor during the dissection, and, when the flap was removed, it looked like a piece of leather. There was no contraction; but it was as large when separated as *in situ*. The retractor having been removed, the bowel bulged forward, and formed a tumor almost as large as when covered by the vaginal walls. The sutures, twenty-eight in number, were introduced one-fourth of an inch apart, and three-eighths of an inch from the edge, giving that much

surface for adhesion. The sphincter ani was paralyzed by dilatation, and the bowels kept relaxed.

July 4.—Patient a little restless; pulse 100; skin hot; complains of an uneasy sensation, but no positive pain, about the vagina. One drop of Fleming's tincture of aconite-root was administered in water every hour, and one grain of the watery extract of opium every four hours; beef-tea and milk-diet.

July 5.—Has slept well; pulse 100; skin dry, but not as hot as yesterday; treatment continued.

July 6.—Pulse 85; skin moist; vagina hot; bowels moved by confection of senna; warm-water injections *per vaginam* to be used every two or three hours.

July 7.—Pulse 70; skin moist; vagina cooler; the tincture of aconite to be discontinued; the opium to be given in half-grain doses.

July 8.—All medication to be discontinued, there being no indication for constitutional treatment.

July 20.—Sutures removed, firm union having taken place in every part of the incision.

August 4.—The perineum was restored by the usual method; and, on September 10th, the patient left the hospital, perfectly cured.

Case 2.

Vaginal rectocele.

Maria H——, aged thirty-nine, admitted to Columbia Hospital July 7, 1867; delivered of her first child seven years ago, since which time she has suffered from difficulty in moving her bowels, and, according to what she had been informed, falling of the womb. To remedy this, her physician had introduced an inflated gum-elastic pessary, which, while it remained in the vagina, afforded her some relief, but was always displaced during defecation, or in coughing. On examination, a tumor was found protruding through the labia, which consisted of the posterior wall of the vagina and anterior wall of the rectum. The finger passed into the rectum and brought forward could be felt at the bottom of the tumor.

July 10.—Patient having been ætherized and placed in position, a section was removed of the same shape and in the same manner as in the case previously reported. No pain or constitutional disturbance followed the operation. The patient left, August 13th, cured.

Case 3.

Vaginal rectocele.

Mary R——, aged forty-four, admitted August 29, 1867; has had eleven children, the youngest five years old. She was operated upon twice unsuccessfully. For the last four years she has worn a pad made of hard wood, conical in shape, pressed between the labia, to keep the tumor inside of the vagina. The constant pressure of this pad against the urethra caused considerable irritation, burning, and itching of the vulva, and some ulceration of the perineum, which had been partially ruptured. She was a large, fat woman, weighing over two hundred pounds. The vagina was unusually capacious, and its outlet enormous.

When the patient stood erect and coughed, a large mass of loose, flabby tissue protruded from the vulva, which, upon examination, was found to be from the posterior wall of the vagina. The anterior wall had not yielded; the uterus was low down, but not prolapsed. An injection of a pint of water was thrown into the rectum, the nurse placing the finger firmly upon the anus, and the patient directed to strain, when the tissue filled out, like an inflated bladder, to the size of a large apple.

September 3.—I proceeded to operate, anæsthesia having been produced by æther. The dissection was very difficult, the rectum being more intimately adherent to the vaginal wall than in any case I had previously encountered. Nearly two hours were occupied in removing the flap, the edge of the knife having to be used throughout. The parts were united by twenty-six sutures, the ends of the wires having been clamped with a piece of tea-lead, to prevent irritation of the anterior wall of the vagina. The sphincter ani was paralyzed, as usual in such cases.

For several days following the operation there was considerable constitutional excitement; pulse rapid and wiry; skin hot; great thirst; and an almost entire suspension of the function of the kidneys.

The treatment consisted of aconite and spirits of nitre internally, and suppositories of one grain of the watery extract of opium put into the rectum every six hours. The vagina was syringed out every two or three hours with a weak solution of carbolic acid, three grains to the ounce of water. By the fifth day all unpleasant symptoms had disappeared, and on the fourteenth the sutures were removed, and union found to be perfect.

October 10.—Patient dismissed, cured.

Case 4.

Vaginal rectocele.

Mary C——, aged fifty-seven; has had five children, the youngest being twenty years of age; admitted into Columbia Hospital November 8, 1867, suffering from a severe prolapsus of the posterior wall of the vagina, which first began to trouble her fifteen years before. She had worn pessaries, and almost every variety of contrivance, for the purpose of keeping the tumor within the vagina, but to little purpose. It was inflamed and irritable anteriorly from the passage of urine over it, and its posterior surface covered with patches of ulceration produced by the friction of the clothing. She had been ill-fed, hard-worked, and poorly housed for several years, which, combined with the constant irritation about the tumor, had reduced the woman to a most deplorable condition. She was placed in bed, the tumor reduced, the vagina packed with raw cotton soaked in carbolized glycerine, and the bowels moved daily by an enema. The nurse was ordered to rub her daily, from head to foot, with a dry, pickled towel. Her diet was varied to suit her taste. Her appetite being capricious, no special order could be given. A pint of porter daily was allowed, and sirup of iron, quinia, and strychnine administered as a tonic. This treatment was continued for three months before she was in a condition to permit of an operation for radical cure.

February 17, 1868:—Patient ætherized; the full clinical class present. Almost the whole posterior wall of the vagina was removed, the dissection being easy, having been effected almost entirely by the handle of the scalpel. A few drops of blood only were lost, and the parts were adjusted by twenty-three sutures. The patient was then removed to bed, and placed on her left side, this position causing the bowels and uterus to tip forward, and thus relieving the vagina of their weight.

From the time of the operation to the removal of the wires, on the fifteenth day, the patient complained of no pain, and there was manifested no constitutional disturbance whatever. The union of the parts was perfect, and the patient dismissed, March 28th, cured.

There has been no case in the hospital, since I have had charge, where the benefits derived from general and local treatment have been more strongly marked. This woman came into the institution an emaciated,

helpless sufferer, broken down in spirit, and feeling, as well she might, life to be a burden. She left physically sound, full of hope, able and willing to labor for her support.

Case 5.

Vaginal rectocele.

E. S——, aged forty-three; mother of six children, the youngest eight years of age; has been in bad health since the birth of her last child. She complains of constant pain in the back, dragging pain in the groins and thighs; suffers much from constipation, her bowels never being moved without medicine, which she takes about once in eight or ten days.

Examination showed an irreducible femoral hernia on the left side, and a large rectocele, which, by its own weight, had dragged the uterus down with it, the os showing at the vulva above the tumor. The margin of the anus was surrounded with irritable hæmorrhoids. The uterus was but little enlarged, its displacement being evidently due to the rectocele, and not to its own weight.

The first indication in this case was to bring the bowels into a regular condition, and relieve her of the pain occasioned by the hæmorrhoids. For the purpose of relieving the constipation, she was placed upon the "belladonna-treatment," the particulars of which plan of treatment will be fully described in another part of this report. It succeeded admirably, as it does in all chronic cases. The painful condition of the hæmorrhoids was relieved by hot fomentations, and the application of the following ointment:

℞ Unguent. gallæ, ℥ss.
Extract. opii, (aq.), ℥ss.
Goulard's ext. plumbi, gtt. xxx.
Camphoræ pulv., gr. x.

After the inflammation had subsided, the hard tumors around the anus withered, and were excised with scissors. During this time, the rectocele had been retained within the vagina by pledgets of cotton soaked in glycerine, which were renewed daily.

February 14, 1869.—Patient having been ætherized, (the clinical class present,) a free dissection of the posterior vaginal wall from the rectum was made, the separation having been easily and rapidly effected. A large flap, four inches in its widest diameter, was cut out, the parts adjusted in the

usual manner, and the patient placed in bed on her left side. On the sixteenth day the sutures were removed, and union was found to be perfect.

March 20.—Patient dismissed, cured.

Case 6.

Vaginal rectocele.

Annie T——, aged thirty-four; admitted to hospital June, 1869; mother of two children, youngest seven years old. Since the birth of this child she has been in declining health, and suffered from pain in the back, aching in the groins, and profuse leucorrhœa, often tinged with blood. Marital intercourse was attended with great suffering. She was haggard and care-worn in appearance, and generally emaciated.

Examination revealed a uterus one-third larger than normal, os patulous, and the lining membrane of the cervix intensely inflamed. The posterior wall of the vagina bulged forward, and, when the patient was in the erect position, protruded externally.

Some months elapsed before this woman was in a condition to submit to the operation for the radical cure of rectocele, the condition of the uterus and her general health requiring previous attention.

The general plan of treatment adopted was the same as pursued in similar cases.

October 3.—Operation for rectocele performed in the usual manner.

October 18.—Sutures removed; union perfect.

Patient dismissed, cured, November 8th.

I have since delivered this woman of a child at full term. Her labor was natural, and the passage of the child through the inferior strait as rapid as usual. Her recovery was perfect. The vagina regained its tone, and the uterus remained *in situ*, although larger than usual.

Note.—The remaining cases operated upon by me for this special difficulty possess no points of particular interest. They were similar in general characteristics to those reported; the details of the operation were the same in almost every respect, the preceding and after treatment having been varied to suit the indications.

The whole number of cases operated upon for this lesion was seventeen; all cured.

CYSTOCELE.

This lesion rarely, if ever, occurs in women who have not borne children, being caused by undue distension of the vagina during parturition. The anterior wall of the vagina, having lost its tone, fails to support the bladder, and, as the water accumulates in that viscus, yields and forms a pouch, which gradually increases in size, and finally appears between the labia and escapes externally. This pouch or bag is constantly filled with urine, which cannot be emptied unless the patient returns the tumor within the vagina, and retains it during micturition. The retained urine undergoes decomposition. The mucus of the bladder, acting as a ferment, decomposes the urea, one equivalent of which uniting with two equivalents of water forms two equivalents of carbonate of ammonia. This salt is extremely irritating to the mucous membrane, producing cystitis, with its long train of attending discomforts, which, rapidly wearing upon the woman, reduces her to a most pitiable condition.

There is far more discomfort attending this form of partial prolapse of the vaginal walls than accompanies rectocele, and it gives rise to more constitutional disturbance.

The treatment for its cure is the same in every respect as that adopted for the cure of rectocele, the tissue being removed from the anterior instead of the posterior wall. The dissection is more difficult, on account of the intimate adhesion of the vaginal walls to the bladder, which, without very great care, might be wounded.

Twelve cases have been operated upon in the hospital, in all of which the results were successful.

Case 1.

Vaginal cystocele.

Martha W——, aged thirty-nine; mother of one child eleven years of age; has had eight miscarriages, each time between the third and fourth month. After the birth of her first child, she noticed a small tumor at the entrance to the vagina, which gradually increased in size, and, after a few months, pressed the labia on one side and made its appearance externally. The surface became abraded from friction with the clothing, giving rise to a discharge which was offensive and irritating to the adjoining parts. She

complained of constant pain in the loins, a dull, continuous aching over the pubes, and a frequent disposition to micturate. The urine was albuminous and fetid. Her general condition and appearance indicated venereal disease.

August 17, 1869.—Patient having been fully ætherized, a large section was removed from the anterior wall of the vagina in the same manner as described in the operation for rectocele. The parts were accurately approximated by seventeen sutures, and the patient placed on her left side. A self-retaining catheter was inserted to prevent any accumulation of urine, which was removed daily, and the bladder washed out with carbolized glycerine and warm water. A good recovery resulted from the operation, the sutures having been removed at the usual time, and union found to be perfect.

The functional disturbance of the kidneys was undoubtedly secondary. The irritation commenced in the mucous membrane of the bladder, owing to the ammoniacal condition of the retained urine. By continuity of surface, this irritation extended to the ureters, which were further injured by being dragged downward with the prolapsed bladder. Functional disease of the kidneys necessarily ensued.

The indication, obviously, in this case was to remove the original cause of the disease. This could only be accomplished by reducing the anterior wall of the vagina to its normal size, retaining the bladder *in situ*, relieving the ureters of the strain upon them, and preventing the undue retention of the urine in the bladder. All these indications were met, and the result, so long as the patient was under observation, proved very satisfactory. The condition of the bladder rapidly improved, the albumen diminished in quantity, and the pain in the back disappeared.

I was unable to follow this case to its termination, as the patient left for her home much sooner than was desirable.

Case 2.

Vaginal Cystocele.

G. B., aged thirty-two; married at fourteen; mother of five children; her first child was not born until her twenty-third year, since which time her menstrual period has not returned on account of intervening pregnancy. Her youngest child, which is still nursing, is sixteen months old.

Examination revealed a medium-sized cystocele, which, she stated, had

existed for more than three years, and had increased since the birth of her last child. The cervix uteri was dragged down and hypertrophied. She complained of pain in the back and uneasiness about the bladder, with a disposition to frequent micturition.

It being desirable to reduce the hypertrophied os and cervix before operating, the patient was kept in bed the greater part of the day, and a stream of water, hot as could be borne, thrown, *per vaginam*, upon the uterus for fifteen minutes, morning and evening, giving the vaginal canal a hot bath. This was followed by the introduction of cotton soaked in glycerine. Thus treated, the cervix rapidly melted down, and, in six weeks from the time of admission, the patient was in good condition for operation.

November 18, 1869.—Operation performed; sutures removed December 2d; union found perfect; and patient dismissed, cured, December 21st.

Had this woman continued without treatment there is no doubt she would have gradually fallen into the same condition as Case No. 1, but timely interference, before the diseased condition of the bladder became sufficiently advanced to involve the ureters and kidneys, saved her from a secondary disease which is seldom curable.

Case 3.

Vaginal Cystocele.

Ellen L——, aged thirty-seven; mother of one child, thirteen years of age. At the birth of this child the perineum was completely ruptured, and, from that time to the date of her admission, she has considered herself an invalid. For the purpose of keeping the bladder and uterus within the vagina she has, for many years, worn a pad strapped tightly up to a girdle which passed around her waist. When the parts became too much irritated by the pressure of this pad, she would remove it, in order to give them an opportunity to recover, but, during that time, she was compelled to lie in bed, as the protrusion of the tumor, when unsupported, gave her more pain than she could endure in the erect posture.

The neck of the uterus was enormously hypertrophied, but not in an ulcerated condition. The anterior wall of the vagina protruded to the size of a large orange. It was considered useless to operate on the vagina and leave the hypertrophied neck of the uterus, as it would most certainly have

dragged the bladder down again, and, in a few months, reproduced the existing trouble. It was, therefore, determined to amputate the cervix before operating upon the cystocele.

February 8, 1870.—The whole vaginal portion of the cervix was amputated by the flap-operation, the flaps having been brought together by the quill-suture, and a small piece of tea-lead introduced to prevent occlusion of the os. The parts united kindly, and the sutures were removed on the twelfth day. Two weeks afterward my usual operation for cystocele was performed, with the same success as in previous cases.

May 15.—The perineum restored.

No constitutional disturbance followed either of these operations.

I have twice examined this woman, at intervals of several months, since her discharge. The vagina remained compact, and the uterus elevated and healthy.

The remaining cases were similar in character to those reported. All were cured.

DISEASES AND DISPLACEMENTS OF THE UTERUS.

PROLAPSUS, COMPLETE AND INCOMPLETE—TUMORS—SUBINVOLUTION—CERVICAL METRITIS, ACUTE AND CHRONIC—ENDOMETRITIS OF CERVIX—CARCINOMA OF BODY AND CERVIX—PELVIC CELLULITIS, ETC.

Without due reflection, it appears remarkable that the uterus should be subject to such a long list of ailments as are above enumerated, situated, as it is, deep in the pelvic cavity, suspended by the most ingenious contrivance for retaining it in its normal position, protected in almost every direction from injury, being only exposed to shock or concussion through the vaginal channel.

While anatomically thus protected, its functions are of a character which render it more liable to disease and disturbance than any other organ in the female body. From the period of puberty, which may be stated to arrive at about fifteen years of age, to the climacteric period, which generally occurs at forty-five, this organ is subjected, every four weeks, to great functional excitation, forming, as it does, the most important element in the group of phenomena known as menstruation. This occurs, during the ordinary life of a woman who bears no children, some three hundred and ninety times—three hundred and ninety efforts being made by nature, during these thirty years, to procreate the species, but, owing to some pathological condition of the uterus, or to the absence of the spermatozoa, each attempt has resulted in an abortion. Let us look a little into the changes which occur in the uterus and appendages at each menstrual *molimen*.

On the advent of the menstrual period, a Graafian follicle in one or other of the ovaries becomes the seat of an unusual vascular excitement. The capillaries which surround it increase in size. From these distended vessels an abundance of fluid of a light straw-color is poured into the follicle, which gradually projects from the surface of the ovary, until finally its attenuated membraneous covering yields to the pressure from within, ruptures, and the egg escapes. While these changes have been going on in the ovary, equally important ones have been taking place in the uterus and Fallopian tubes.

The uterine vessels enlarge; the parenchyma of the organ becomes

firmer; its cavity and the inlets from the Fallopian tubes, as well as the tubes themselves, become larger and more patent; the mucous membrane is no longer pale and smooth; the minute, tubular follicles, which, in the quiescent state of the organ, are only demonstrable by a highly-magnifying power, are now erect and engorged with blood, giving to the whole internal surface of the uterus the appearance of cut velvet. The mucous membrane of the Fallopian tubes partakes of the same vascularity, and its ciliated epithelium can be seen in a state of great functional activity, producing a strong current from the extremity of the tubes to their termination in the uterine cavity; the fimbriated extremity becomes directed toward that part of the ovary from which the egg is about to escape, and, at the moment the Graafian follicle ruptures, receives the egg within its grasp. During the passage of the egg through the Fallopian tube it absorbs some of the fluid it there meets, and enters the uterus larger than when it left the ovary. By this time the changes in the mucous membrane of the uterus are complete, and everything is ready for the nourishment of the egg. The first steps toward the propagation of the species have been made, viz: the formation and maturation of a germ-cell, its passage to, and the preparation of, the uterus for its reception. All it now awaits is the fecundating influence of the sperm-cell. If that remains absent, the egg, or germ-cell, withers, the vascularity of the uterus diminishes, nature disposing of the increased amount of blood she had directed to that organ for the nourishment of its new occupant. The rupture of the engorged capillaries of the mucous membrane, mixed with the natural secretion of the mucous tubules, constitute the menstrual discharge. *An abortion has occurred.* Is it surprising that an organ, the subject of such oft-repeated progressive and retrograde metamorphoses, should be prone to functional and organic diseases?

When pregnancy occurs, and the physiological changes progress normally to the full period of gestation, we find the uterus, which, in the virgin state, weighs only about ten drachms, has increased to three pounds, this increase being produced by the rapid growth of its muscular fibres. After delivery, this large mass of tissue has to undergo a retrograde metamorphosis, or fatty degeneration and absorption, until it is reduced to about two ounces, always remaining, however, a little larger than in the virgin state.

This phenomenon of involution may be arrested at any stage, and, instead of the uterus returning to its normal size, the whole organ may

remain hypertrophied, or the hypertrophy may be confined to the posterior or anterior wall. In the first, prolapsus will follow; in the second, retroversion or anteversion.

Further reference to subinvolution of the uterus will be made in the reports of the following cases.

PROLAPSUS UTERI, INCOMPLETE AND COMPLETE.

Incomplete prolapse, or procidentia, may exist in different degrees, from slight displacement downward, to the more extreme form, when the os makes its appearance at the vulva, drawing the fundus of the bladder downward and backward, the anterior wall of the rectum downward and forward, and putting the vesico-uterine and recto-uterine reflections of the peritoneum on the stretch.

By the anatomical arrangement of this organ it is maintained in its normal position by the combined support of the utero-sacral ligaments, the anterior, middle, and posterior portions of the broad ligament, the utero-vesical ligaments, and the columns of the vagina, the round ligaments having no share in preventing the descent of the womb. With these natural supports in a physiological condition, and the uterus of its normal size, descent is impossible.

Various conditions will produce prolapsus in the unmarried female. Foremost in the list of predisposing causes is the want of sufficient and regular exercise, without which the whole muscular system remains in an undeveloped condition, digestion is imperfectly performed, and the function of the whole alimentary canal impaired. The nervous system, both sympathetic and cerebro-spinal, necessarily suffers in common with the rest of the body, and fails to afford the normal stimulus to the organs of organic life. Such patients suffer from impaired capillary circulation, as evidenced by cold hands and feet, and the accumulation of fecal matter in the intestinal tract. In the first instance, from want of tone in the longitudinal fibres, the pouches of the colon become impacted, the presence of the impacted matter irritates the branches of the sympathetic nerve, which principally supplies the circular muscular fibers of the intestine, throwing them into a state of tonic contraction, and obstinate constipation is the result. The sigmoid flexure of the colon and upper part of the rectum become filled and gradually distended, forming a tumor which presses the uterus downward, backward, and to the

right. Cathartic medicines (which are generally given in these cases) cause violent expulsive efforts on the part of the intestines, assisted by the diaphragm and abdominal muscles, tending to aggravate the uterine displacement by the increased pressure. The walls of the vagina are relaxed in common with the rest of the muscular system, and fail to give the uterus the support they were intended to afford. Thus pressed upon from above and unsustained from below, the ligamentous supports of the womb gradually yield, and the organ becomes displaced downward. The constipation continuing, the return of blood from the uterus is obstructed, causing congestion. Irritation necessarily accompanies it, and hypertrophy of the whole organ, or the anterior or posterior wall, follows. We then have the uterus increasing in weight and its supports diminishing in power.

With the system in this condition, the woman often subjects herself, spasmodically, to violent exertion. Young ladies, who consider themselves unequal to the task of walking two or three blocks, will go to a ball and dance continuously for hours, and that, frequently, when the uterus is still further enlarged by the congestion attending the menstrual period. Such a combination of predisposing and exciting causes cannot fail to produce prolapsus, with its train of attending evils.

In the married woman we may have all the predisposing and exciting causes which we have enumerated in the unmarried. Indeed, in a large number of cases, women marry when, physically, they are totally unfit to assume the duties of the marital relation, the functional disturbance of the genito-urinary organs being too serious to permit of healthy intercourse with the male. If the pre-existing functional disturbance has been of long-standing, the secretions of the mucous membrane become altered in character and increased in quantity. The cervix becomes blocked up with an abnormal mucus, which offers a mechanical obstruction to the passage of the spermatozoa, which, if not destroyed by contact with the unhealthy secretion of the vaginal tract, are unable to enter the uterine cavity, and the woman remains sterile. Anxiety and dissatisfaction with this condition leads to too frequent connection, which necessarily increases the existing troubles by the still further congestion and probable inflammation of the uterus.

If, notwithstanding the diseased condition of the uterus, the woman becomes pregnant, and gestation continues until the full period, the probabilities are that her recovery from parturition will be imperfect, the uterus

remaining in a state of subinvolution. The muscular tissue of the vagina, relaxed before delivery, and recently distended by the passage of the child, remains loose and flabby, and affords no support to the uterus, which is too large to be retained in position by its ligaments.

The most severe cases which the gynæcologist is called upon to treat belong to this class of patients.

If the woman be perfectly healthy when she marries, be well taken care of during the period of gestation and after delivery, and no untoward accident occurs during parturition, (such as rupture of the perineum,) there will be no displacement of the uterus following labor.

Rupture of the perineum, of itself, is a sufficient cause (if not restored at an early date) to produce complete prolapsus.

Tumors of any kind which increase the weight of the organ without corresponding increase of power in its supports will finally produce procidentia, either in the married or single.

The symptoms thus created depend upon the grade of the lesion. Vesical irritation is a prominent symptom in all stages. Next in order of frequency comes leucorrhœa, lumbar pains, menorrhagia, dysmenorrhœa, and extreme fatigue upon the slightest exertion.

The physical signs are so well marked that a digital examination at once reveals the true condition. The diagnosis is easily made unless the practitioner be grossly ignorant or unusually careless, the presence of the cervix and os being conclusive.

The complications attending prolapsus of the uterus are grave and numerous. In the more extreme forms of displacement, chronic metritis and endometritis, of greater or less severity, always exist; in the milder forms, congestion and hypertrophy of the uterus, sub-acute peritonitis, rectocele, cystocele, and, as concomitants, rectitis and cystitis. Whatever the stage of the prolapsus we are called upon to treat, the indications are the same :

First, reduce the weight of the uterus.

Secondly, strengthen the uterine supports.

Remove the corsets, suspend the skirts from the shoulders, and let the patient, during the early period of treatment, be placed in bed or in the reclining position.

If the uterus be still in the vaginal canal, and (as is generally the case)

the cervix tumid and tender, let a stream of water as hot as can be borne comfortably be thrown into the vagina, morning and evening, for fifteen minutes at a time, giving the uterus a hot bath. This affords great relief to the patient, and is one of the most efficient means of reducing the hypertrophy and subduing the existing inflammation. The stream should be continuous, and, during the administration, the patient must be placed in a recumbent position. After each injection apply a pledget of raw cotton, soaked in glycerine, to the uterus, leaving it there until time for the next bath. In all these cases there will be found cervical endometritis, if not corporeal. I have had more success with the use of pure carbolic acid, applied directly to the mucous membrane, than by any other treatment. It causes no pain by its application, and excites no undue irritation. It should be applied on a piece of raw cotton, wound around "Sims's" applicator, and used once a week as long as necessary. A daily movement from the bowels must be secured, not by means of cathartics, but, if there is obstinate constipation, by the belladonna-treatment, as detailed under "Constipation;" if the constipation be of a mild form, a simple injection will be sufficient to secure a daily passage. Tonics should be given to the point of toleration. I have found the sirup of the phosphates of ferrum, quinia and strychnia answer better in my hands than any other preparation. There are very few cases of prolapsus in the first stage that will not yield to this treatment in two or three months. If the vagina remains relaxed after the uterus has been reduced to its normal size, and does not recover tone, a current of electricity, passed through its walls daily, will generally suffice to complete the cure.

In the second stage of the disease, where the os appears at the vulva, and the uterus is found resting on the perineum, in addition to the treatment adopted in the first stage, it will generally be found necessary to amputate the vaginal portion of the cervix, which will be found in a state of chronic hypertrophy, the enlargement being due to an increase in the amount of connective tissue. This form of hypertrophy will not yield to topical applications or general medication, and all attempts at radical cure will be frustrated unless it is removed. After the removal of the cervix, a sufficient time must be allowed for the vagina to recover its contractile power, the patient in the mean time being kept strictly in the recumbent position. If, at the end of two or three months, the vaginal walls are still flabby, and

afford no support to the uterus, the operation of elytrorrhaphy, for lessening the dimensions of the vagina, must be resorted to.

The method of performing this operation is fully described in the remarks on rectocele.

Whenever the perineum has been ruptured, it must be restored, whatever the degree of the prolapse may be; for if only in the first stage, and, by rest and the employment of the means suggested, it is cured for the time being, it will certainly be reproduced unless the perineal support is restored.

The third stage of this troublesome malady is necessarily accompanied by eversion of the vagina, the walls of which generally carry with them both rectum and bladder. The photograph of C. D., illustrating Case 14, shows the condition of an extreme case, two weeks after the cervix had been amputated. The operation and history of the patient will be described in the report of Case 14.

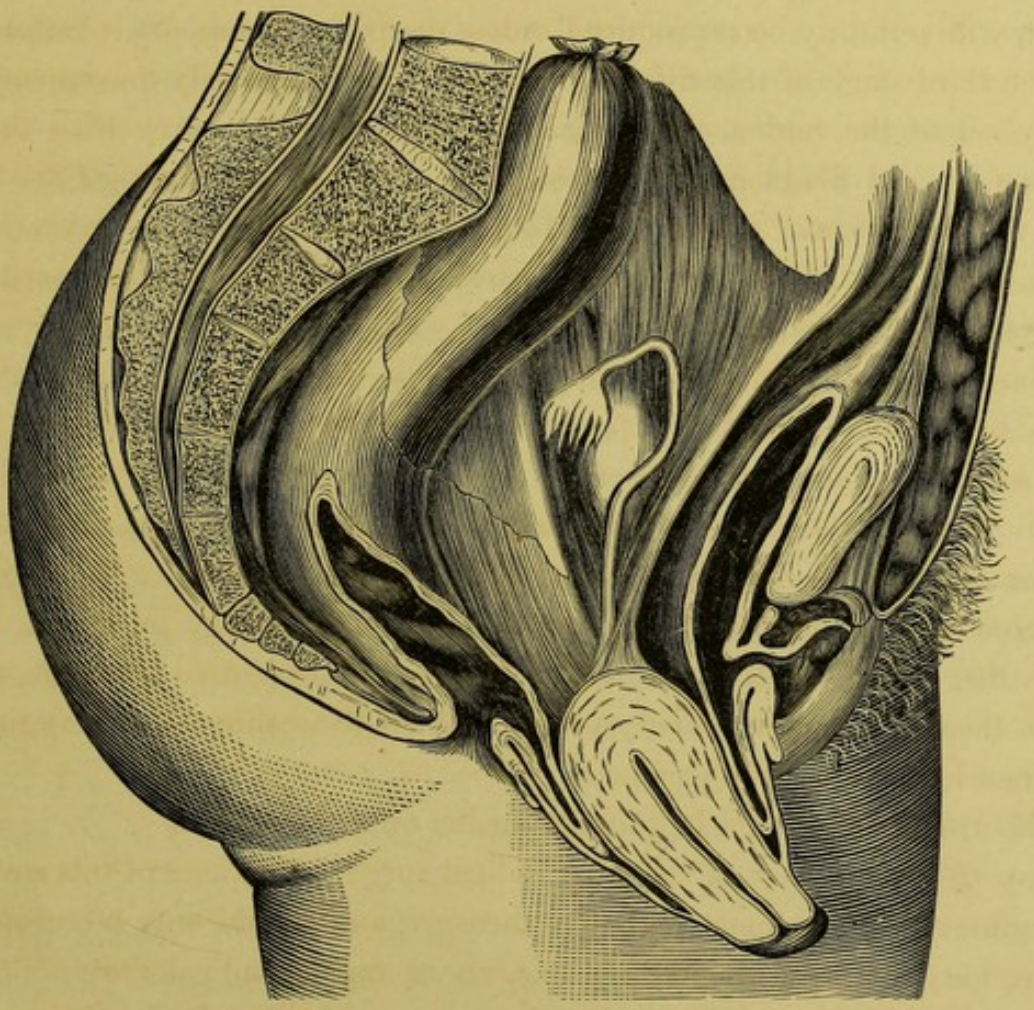
Plate 7 shows the change produced in the position of the internal viscera by this lesion, and affords an opportunity for a better appreciation of the causes which produce the more serious symptoms accompanying it.

The indications for treatment in this, the most severe form of uterine displacement, are the same as in the middle forms, viz: reduce the size of the uterus by subduing any inflammatory action that may be going on; remove the enlarged cervix; return the uterus to its normal position, and retain it there by the medicated cotton; reduce the caliber of the vagina; and, when lost, restore the perineum.

This treatment should be pursued in the order laid down.

Any treatment short of the most radical surgery for cases of this severity is confessedly but a mere palliative measure, and should only be resorted to when, for good and sufficient reasons, an attempt at radical cure is inadmissible. Pessaries, as a means of cure, are worse than useless. Numerous operations have been devised, having in view the reduction of the caliber of the vagina, or the diminution of the orifice of the vulva. Mend proposed, after the uterus had been forcibly returned into the vagina, to form an artificial hymen, which should constitute a sort of diaphragm on which the womb could rest.

Fricke's operation consists in removing a portion of the inner surface of each labium, about two fingers in breadth, commencing above the superior commissure and terminating about half an inch below the frenulum, and



The left half of the pelvis and corresponding half sections of the bladder, uterus, and rectum, with ovary, Fallopian tube, and round ligament; the three latter still in their natural relations with the broad ligament, which is seen on the stretch, pulling strongly on the margin of the pelvis, sub-peritoneal pelvic cellular tissue, and pelvic reflexions of the broad ligament. The bladder drawn down with the uterus, owing to the intimate connection between the two, and the posterior wall of the vagina torn from its cellular connection with the rectum.—*Savage.*

uniting the parts by some ten or twelve sutures, forming a sort of scrotum, in which the uterus might rest. This, it was believed by M. Fricke, would be amply sufficient to retain the organ to its place. Dieffenbach and other prominent men lent the weight of their names to its support. But, nevertheless, in spite of the high-flown expectations which had been excited concerning it, the lapse of time, which brought with it calmer judgment, compelled its most zealous advocates to admit "that its success was, at the best, extremely imperfect, and that, in the large majority of cases, the operation failed completely." It, and the various modifications of it, having proved so signally unsuccessful, have been abandoned on the continent.

Baker Brown's modification is much less radical than Fricke's, or Malgaigne's improvement on Fricke, and I must fully concur with West, who observes, speaking of the fifty cases of reported cure by Baker Brown, "When, therefore, we find Fricke's operation, as modified by Malgaigne, who carried his incisions much deeper, and removed a considerable extent of mucous membrane at the orifice of the vagina, in order to include a still larger surface in the suture, abandoned on account of its not being followed by permanent success, we hesitate to pronounce an opinion on the alleged successful result of almost every one of fifty cases in which the modified operation was performed by one surgeon." I have operated a number of times for the cure of this lesion, combining reduction of the caliber of the vagina with restoration and elongation of the perineum, leaving the os and vaginal portion of the cervix intact. For a time, varying from six months to two years, they have been partially successful, but the uterus eventually made its appearance at the outlet, and finally escaped. This I attributed to the removal of too little tissue from the vagina, and recommended to others and determined myself to be more radical in the operation in the future.

I found, however, that the fault was not in removing too little from the vagina, but in not removing the vaginal portion of the cervix. I now make its removal the primary step in the operation, following it by reducing the dimensions of the vagina, and finally restoring the perineum. Since I have adopted this course, the results, so far as I have been able to ascertain, have been entirely successful, and the experience of my friend, Dr. G. Thomas, of New York, coincides with my own, he having adopted the same method. I amputate the cervix and allow the parts to recover before reducing the

procidentia; it is safer, being less likely to be followed by acute inflammation of the body or peritoneum, which sometimes follows the simple reduction without any other interference with the parts.

I reduce the procidentia, when extreme, by seizing the entire mass in my left hand, with which I exert steady compression, for the purpose of reducing the amount of blood in the organs; then, pressing the fingers of the right hand immediately in front of the anus, commence to invert the protruded membranes at that point, as these yield to the pressure assisting their return by a gentle pushing of the uterus upward and backward.

Reduction by this plan is readily performed if there are no firm adhesions binding the uterus down.

PROLAPSUS UTERI.

Case 1.

Prolapsus Uteri, first stage—Relaxation of vaginal walls—Profuse Leucorrhœa —Cervical Endometritis.—Cured.

Mrs. R——, aged twenty-five; has been married seven years, but never became pregnant. Complains of pain in the back, aching in the groins, frequent disposition to urinate, costive bowels, and profuse leucorrhœa. She states that she has been troubled with this discharge since her girlhood, but that it has been worse since she was married. Intercourse with her husband gives her great pain, and when she sits upon a hard seat it hurts her, appearing to push something upward that is tender. Appetite capricious; whatever she eats disagrees with her; tongue coated; pulse 94.

Examination.—Vagina lax; uterus retroverted, and within two inches of ostium vaginale; cervix hypertrophied; os patulous and eroded, its cavity filled with tenacious mucus, tinged with blood; pressure of the finger in the posterior *cul-de-sac* gives pain, as also lifting the uterus up on the finger.

Treatment.—For the first two weeks the treatment, consisting of hot-water injections to the uterus, morning and evening, for fifteen to twenty minutes at a time, followed by the introduction of a pledget of raw cotton, soaked in glycerine, passed up to the posterior *cul-de-sac*. The belladonna-treatment for the bowels brought away large masses of scyballæ, some of which had undoubtedly been impacted for months. During this time no

application was made to the cervical canal, it being considered better to reduce the inflammation first. This was followed by the application of pure carbolic acid to the mucous membrane of the cervix every four or five days. After each application a suppository was passed up to the uterus, containing two grains of the watery extract of opium, the following formula being used in its preparation:

℞ Butyrii cocoæ, ʒij.
Aq. ext. opii, gr. xij.
M. ft. suppos., No. vj.

Absolute rest in the recumbent position was strictly enjoined.

As a tonic the sirup of the phosphates of iron, quinia, and strychnine was given in teaspoonful-doses after each meal.

The cervical inflammation readily yielded to this treatment. At the expiration of three months it was reduced to one-half the size it presented at the time she came under my charge. The secretion of the cervical canal was normal. The vagina had partially regained its tone, but the uterus was still retroverted, owing to the hypertrophy of its posterior wall.

The warm-water injections were continued, but the one administered in the evening was thrown into the rectum instead of the vagina, about three-parts of a pint being used. It was allowed to remain and be gradually absorbed, the rectum being tolerant of its presence. The water having been thrown into the bowels brought it into more immediate contact with the body of the uterus than *per vaginam*.

A weak current of electricity was directed through the vagina and uterus daily, for about five minutes at a time. This was gradually increased in strength, and the time prolonged to ten and, finally, fifteen minutes.

At the expiration of six months the uterus had ascended to its normal position. It measured two and three-fourths inches from os to fundus, and the whole organ appeared healthy. The vagina had entirely recovered its tone; the bowels were regular, a movement being had daily; appetite and digestion good.

The patient was dismissed, cured, with instructions to take no cathartic medicine at any time, but, if the bowels were not moved, to take a tepid-water enema, never permitting a day to pass without securing a movement.

Case 2.

Mrs. S——, aged thirty-two; has been married thirteen years; been pregnant five times, but aborted on each occasion between the fourth and fifth month. She first menstruated at eleven years of age, and was regular up to the time of her marriage; but, for three years before that event, her discharge had been excessive, lasting for seven and eight days, and saturating six to eight napkins daily. Since her marriage she has menstruated every two weeks, never having more than one week's exemption except when pregnant. Intercourse with her husband always caused hæmorrhage, and, from the first, was attended with pain, which increased rather than diminished. She suffered from constipation, and its attendants, headache and nausea.

Examination.—The uterus was low down, the os within an inch of the vaginal outlet; the cervix hard and nodular; os patulous, but not eroded; vagina relaxed and irritable; the parts were bathed in a muco-purulent discharge. The probe, passed into the uterine cavity, showed the distance from os externum to fundus to be four and one-half inches. Although used with great care it caused considerable pain, and, when withdrawn, was followed by blood.

The enlargement appeared general, and was due to subinvolution of the organ.

The treatment in this case was the same as in Case 1, with the exception that chromic acid was substituted for carbolic acid, and the galvanic current used less frequently.

Her first pregnancy occurred when the uterus was in an unhealthy condition, and not capable of passing through the different stages of progressive metamorphosis; hence her first abortion. From this she probably did not fully recover, and, again becoming pregnant while the uterus was in this condition, she again aborted, and so on until the time when she sought medical aid.

This patient was under treatment four months only, at the end of which time she was dismissed, cured.

CASE 3.

Prolapsus Uteri, second stage—Partial Rectocele and Cystocele, with Loss of Perineum.

Mrs. B——, aged thirty-seven; married at seventeen; mother of four children, youngest twenty months old; has had repeated miscarriages, all of which she produced herself by the use of a steel sound.

She complains of general abdominal tenderness; pain in left groin; constant desire to micturate; bowels moderately regular, but a movement always painful; inability to stand; profuse leucorrhœa; menstruation irregular and excessive; appetite and digestion good, but feels nervous and irritable. A very little cause will produce a violent display of temper, which, she says, is not natural to her.

Examination.—Uterus visible at the vulva, with a fold of membrane anteriorly and posteriorly accompanying it; os patulous, eroded, and hypertrophied, measuring two inches in diameter. It felt as hard as bone. A sound, passed into the bladder, made its appearance at the vulva, if turned in that direction; the finger, introduced into the rectum, followed the posterior fold of membrane downward; perineum rent to the anus, but the rupture not involving the sphincter.

Treatment.—Hot-water irrigation to the uterus, morning and evening, followed by applications of glycerine; bowels kept regular by the use of tepid injections; rest, in the recumbent position, constituted the treatment for the first six weeks, and it succeeded in giving entire relief from pain and tenderness. But, although the uterus had been retained in position by the pledgets of cotton, and the patient kept on her back or side during the whole time, there was no diminution in the size or hardness of the cervix, and it was determined to amputate the enlarged and hardened portion. This was done by the flap-operation, the parts united by silver sutures, a small piece of lead being left in the remains of the cervical canal to keep it patent. The parts united kindly.

A small section was next removed from the vaginal walls anteriorly and posteriorly, the operation being the same as reported under the head of cystocele.

Two months after the operation of elytrorrhaphy, the perineum was restored, with the usual success.

Patient dismissed, cured.

Case 4.

Mrs. E. H——, aged fifty-seven; mother of thirteen children; has had prolapsus uteri for thirteen years; wears a pad and napkin to keep it within the vagina; bowels always costive; otherwise enjoys good health.

She complained of the usual symptoms accompanying this lesion, and examination showed prolapsus in the third degree. Uterus hypertrophied, and cervix inflamed; the anterior wall of the vagina much thickened, and hung loosely like a curtain in the cavity when the uterus was returned and kept in place by the retractor. Injection of the bladder did not affect this pouch of membrane, proving that it was a simple hypertrophy and prolapse of the anterior wall, and not a cystocele.

The same plan of treatment was adopted for the reduction of the inflammation and hypertrophy of the womb as in Cases 1 and 2, and, to a limited extent, proved successful. The patient being compelled to leave for her home in Arkansas, I was induced to operate upon the vagina earlier than otherwise would have been advisable.

I removed the whole of the redundant tissue, which was very loosely connected with the bladder, uniting the edges in the usual manner. The parts healed readily, and the patient left for home, apparently cured.

Two years afterward I heard from her; she was as badly off as ever, the uterus being down, and, upon the least exertion, escaping externally.

The error in treatment in this case was two-fold: first, the body of the uterus should have been more reduced before operating upon the vaginal walls; and, secondly, the vaginal portion of the cervix should have been removed. As it was, the uterus was too heavy for its sole support, the vagina, to retain it in its normal position.

Case 5.

Prolapsus uteri and Vaginæ, complete, two months' duration.

Mrs. R. H——, aged twenty-seven; married one year; three months since gave birth to twins; five days after her confinement got up and went down two flights of stairs; experienced no ill effects from it at the time, but noticed, some three weeks afterward, a tumor projecting between the labia; the lochial discharge ceased on the tenth day.

Complains of abdominal tenderness, and constant desire to micturate; pain in the back and loins; continued nausea.

Diagnosis.—Subinvolution of the uterus, due to nervous shock; prolapsus, due to inability of the vagina to support the increased weight, the prolapse of the vagina being a necessary accompaniment.

Patient was placed in bed, hips elevated, the uterus returned, and retained with the cotton pledget, soaked with the following:

℞ Glycerine, (Price's,) ℥ij.
Aq. ext. opii, gr. xij.

About half an ounce was used in each application. This treatment was continued for one week, the cotton having been changed every twelve hours. At the expiration of this time the hot-water applications were commenced, and continued for eleven weeks, when involution was found to be progressing satisfactorily. The glycerine-treatment was continued during the whole period during which the hot-water was applied.

The vagina remaining lax, the galvanic current was used daily, and the subcutaneous injection of strychnine thrown into the vaginal walls. This last remedy acted like a charm; the vagina regained its tone; the absorbents of the uterus appeared stimulated to increased activity; and, at the expiration of seventeen weeks, my patient was perfectly cured, without any surgical operation.

Had this woman continued without treatment for one year, this result could not have been obtained, as the tissues of the part would have degenerated beyond recovery; at least, such appeared probable.

Case 6.

Prolapsus uteri, complete.

Mrs. S. R——, aged forty-four; mother of two children, the younger seven years of age. Both her labors were extremely short, not lasting over half an hour; but her convalescence, in each case, was protracted. Soon after the birth of her first child, which occurred when she was thirty-two years of age, she began to complain of pains in the back and pelvis, and was unable to stand for any length of time without great inconvenience. When bathing herself she found the uterus very low down, and, for several years, wore a ball-pessary, which she removed and replaced herself. After the

birth of her last child all the symptoms became aggravated, and the uterus finally protruded from the vulva, dragging with it the vagina. It was returned by her attending physician, and a large ring-pessary introduced, which had not been removed for four years.

Her general condition was bad; body emaciated and anæmic; pulse small, and 118 per minute; appetite poor, and digestion imperfect; bowels loose.

Examination.—The os was visible at the vaginal entrance, patulous and ulcerated; the cervix was enormously hypertrophied, soft and pulpy, and of a dark purple color. The weight of the cervix had drawn into the ring the upper part of the vagina and a portion of the body of the uterus, in which position they had become tightly wedged and partially strangulated; the ring was buried in the tissues.

Treatment.—The point of a pair of strong nippers was introduced under the ring, which, with some difficulty, was divided and removed. Hot water and glycerine were freely used until the congestion and tenderness of the parts were relieved. The cervix, remaining enlarged but soft, was reduced by the application of potassa fusa. Chalybeate tonics, stimulants, cod-liver oil, and nourishing diet were freely given. After five months' persistent treatment the uterus was sufficiently reduced in size, and the patient's health in a condition that warranted an attempt at radical cure. Two sections were removed from the vagina in the same manner as before reported; the parts healed kindly, and the patient left, apparently cured. I have not seen or heard from this patient since she left the city, and cannot say, therefore, whether or not the apparent cure was complete.

Case 7.

Complete Prolapsus and Ruptured Perineum.

Mrs. E. G——, aged thirty-five; has been married twenty years; first menstruated at eleven; mother of six children; first child was born when she was seventeen. It was delivered with forceps, and the perineum became lacerated down to the anus. No attempt has been made at restoration. Complains of the usual symptoms accompanying this lesion when complicated with prolapsus.

Examination.—Perineum was ruptured, and the anterior portion of the sphincter ani fissured and ulcerated. The uterus was external to the labia,

and the posterior wall of the vagina prolapsed. The cervix uteri was hard, the os patulous, and filled with bloody mucus. The sound marked four and one-fourth inches from os to fundus.

The same preliminary treatment was adopted in this case as in those previously reported. The uterus was retained *in situ* by pledgets of cotton and glycerine, and, at the expiration of seven weeks from the commencement of treatment, the os was amputated. When the stump healed, the sound measured but two and one-half inches. A section was next taken from the posterior wall of the vagina, measuring three and one-half inches in its broadest diameter. The parts healed kindly, the union, at the expiration of three weeks, being firm.

The perineum was restored in the usual manner, and, seven months from the commencement of treatment, the patient left, cured.

This woman has since borne two children. I attended her at the birth of each. There was no difficulty in the labors; they progressed and terminated normally. Her convalescence occupied about the usual term. The involution of the uterus was perfect. The perineum remained intact, and the vagina appeared fully competent to hold the uterus in place.

Case 8.

Partial Prolapsus.

Mrs. A. I——, aged fifty-five; unmarried; admitted to hospital November 17, 1870. Complains of continual pain in the back, profuse leucorrhœa, and chronic constipation; frequently allows herself to go for two, and even three weeks, without a movement from the bowels. The patient was of phlegmatic temperament, fat and indolent.

Examination.——Os uteri within an inch of the vulva; vagina large, and tissues lax; the uterus not much larger than normal, and apparently healthy.

It was evident that the displacement in this case was due to the enormous accumulations of fecal matter which were constantly pressing the uterus down, the vagina, from its relaxed condition, being unable to sustain it. The indications were to overcome the habit of constipation, suppress the hypersecretion from the mucous membrane of the vagina, and give tone to its muscular tissue.

The first indication was met by the belladonna-treatment, (reported under the appropriate head;) the second by the application of simple glycerine, which perfectly depletes the capillaries of the excess of serum; and the last by the use of the galvanic battery.

This was a case which, under ordinary practice, would have been treated by astringent injections and a pessary. This treatment would have increased rather than relieved the difficulty, and, if persisted in, would eventually have made the case incurable.

By the course pursued the woman was perfectly cured, without an operation, and, should the bowels be kept in regular condition, and moderate exercise taken, she will have no return of her trouble.

Case 9.

Prolapsus Uteri, complete.—Cure.

Sarah S——, aged forty-four; has been married twenty-three years; mother of three children, the youngest seven years of age. She states that she experienced no pain of any moment during her labors, which lasted but a few minutes; has been in the habit of getting about on the fourth or fifth day. For the last eight years she has suffered great pain in the back and loins; has a discharge from the vagina, which excoriates the thighs and renders locomotion difficult.

Examination.—Uterus much enlarged; the cervix engorged and tender; the lining membrane of cervix and body in a state of chronic inflammation. When the patient stood in an erect position the uterus was external to the vulva.

The indications were to reduce the inflammation. With its subsidence the uterus would become reduced in size, and the vagina have an opportunity of recovering its tone.

The usual treatment was adopted—chromic acid being used in the place of carbolic acid—and, at the expiration of seven months, the womb measured but three and one-fourth inches, and was in a healthy condition.

The posterior wall of the vagina being still very lax and hypertrophied, the redundant tissue was excised. The parts united by first intention, and the patient left, eight months after the commencement of treatment, cured.

Case 10.

Prolapsus Uteri, complete, with Cystocele.—Cure.

Mrs. P——, aged thirty-three; admitted to Columbia Hospital, January 24, 1870; by occupation is a feeder to a printing-press; has been in the habit of standing for hours at the press when she desired to empty the bladder or bowels, it happening at the time to be inconvenient for her to leave. One week after the birth of her last child (who is three years of age) she went to her work, and stood for several hours. Since then she has suffered from back-ache, leucorrhœa, and general ill-health; within the last six months micturition has been difficult and painful; and she has been compelled to wear a napkin to keep the uterus within the vagina.

Examination showed complete prolapsus uteri, cystocele, and cervical endometritis. Rest and topical applications in a few months restored the uterus to a healthy condition, and, on May 17, 1870, the operation for radical cure of the cystocele was performed.

May 30.—The sutures were removed, union found to be perfect, and, on June 12th, she was dismissed, perfectly well.

Case 11.

Prolapsus Uteri, complete.

Eliza B——, aged twenty-seven; mother of one child, two years of age. The prolapsus began two months after the birth of child, and the uterus gradually descended, until it now appears between the labia, dragging the anterior wall of the vagina with it. The uterus was little enlarged, and its enlargement evidently due to interference with the circulation by its malposition. Rest and the hot douche soon reduced it.

January 24, 1871.—Operation for cure of the cystocele.

February 18.—Sutures removed.

March 4.—Discharged, cured.

Case 12.

Prolapsus Uteri, complete, with Cystocele and Rectocele.—Cure.

Mrs. W——, aged forty-nine; mother of nine children; has suffered from prolapsus of the womb ever since the birth of her first child. For the

last five years her womb and the entire vagina have been outside the body. Repeated efforts were made to return the tumor, but they were unsuccessful.

The subacute endometritis which existed in this case was first reduced, then the cervix amputated, and, when the stump became firmly healed, a large section of the vagina anteriorly and posteriorly was removed. The parts united by first intention, forming a strong column anteriorly and posteriorly for the support of the uterus.

August 12.—The patient was dismissed, cured.

I had occasion to see this patient, while suffering from an attack of pneumonia, in June, 1872. She had had no return of her trouble. The uterus was well up in the pelvis, and the vagina close and in a healthy condition.

Case 13.

Partial Prolapsus, with Rectocele.

Mrs. N. N——, aged thirty-two; mother of one child, six years of age; has had five miscarriages since the birth of her child. Her habit, from girlhood, has been to allow one or two weeks to pass without a movement from the bowels, and the effort, on these occasions, was so severe that she would frequently faint from exhaustion.

Examination.—The uterus was but little enlarged; its lining membrane inflamed and very tender. The rectum was distended into an enormous pouch, which pushed the labia apart when the bowel was empty, and when filled, formed a tumor as large as a child's head. The prolapsus in this case was dependent upon the rectocele.

The indication was to overcome the habit of constipation before attempting any operation. This was done by the belladonna-treatment, and, as soon as the endometritis became reduced, the usual operation was performed.

The operation was successful, and the patient left, four months after admission, cured.

Case 14.

Complete Prolapsus Uteri, with Eversion of the Vagina, &c.

Mrs. C. D——; aged forty-seven; admitted August 23, 1872; mother of eleven children, the youngest of whom was eight years of age. With the

birth of her fourth child the perineum was ruptured to the anus. She stated that she had suffered but little inconvenience from the accident until after the birth of her last child. The reason of the absence of prolapsus at an earlier period in this case may be explained in the language of the patient herself: "I was in the family-way all the time; my last seven children were born in nine years and two months." Shortly after the birth of her last child, the uterus commenced descending, and finally protruded from the vulva, dragging with it the vagina, bladder, and anterior wall of the rectum. For more than four years she has carried the mass in a bag, supported by a belt passed around the waist; it had not been returned into the pelvic cavity during this time.

She suffered from vesical irritation and constipation, the irritation of the bladder being due to the retention of urine.

Examination.—A tumor as large as an adult head was hanging between the thighs, of a dusky-red color, and covered with a tissue unlike skin or mucous membrane. It consisted of the entire vaginal walls, with the bladder, rectum, and uterus. The cervix as well as the body was enormously enlarged, the os patulous, permitting two fingers to pass readily into the uterine cavity.

A sound, introduced into the urethra, passed directly downward in front of the tumor, and the finger, passed into the rectum, showed the anterior wall to occupy the same position posteriorly as the bladder did anteriorly. The indications were to return the mass, if possible, and reduce the hypertrophy, before operating for radical cure.

The tumor was seized between both hands, and firm pressure made continuously for about fifteen minutes for the purpose of unloading the distended blood-vessels, and, as far as possible, reducing the size of the uterus.

After prolonged manipulation the reduction was accomplished, and a large pledget of cotton soaked in glycerine passed into the vagina, for the double purpose of retaining the uterus *in situ*, and depleting the vessels of the cervix.

October 8.—It having been found impossible to reduce the size or hardness of the cervix, it was decided to amputate it, which was done as high up as possible, a strong pair of blunt-pointed scissors being used for the pur-

pose; the hæmorrhage was trifling. The flaps were brought together with silver wire.

The cervix weighed twenty-two drachms. Its appearance and exact is represented in Plate 7, Fig. 2.

The stump united partly by primary union and partly by granulation. December 2d I performed the operation of elytrorrhaphy, removing an elliptical section six and one-half inches long by four inches wide from the anterior and posterior walls; the dissection laid the rectum and bladder bare.

Fig. 1, Plate 7, shows the appearance of the parts after the cervix had been amputated, the uterus having been drawn down to facilitate the dissection of the vaginal membrane.

A margin of at least half an inch of the vaginal tissues was dissected off around the parts that had been removed, and the raw surface everted. The everted portions were then carefully approximated and retained in position, the lower part by clamps with silver wire and shot, the upper edges by the interrupted wire suture. The clamps and wires were adjusted after the uterus had been returned.

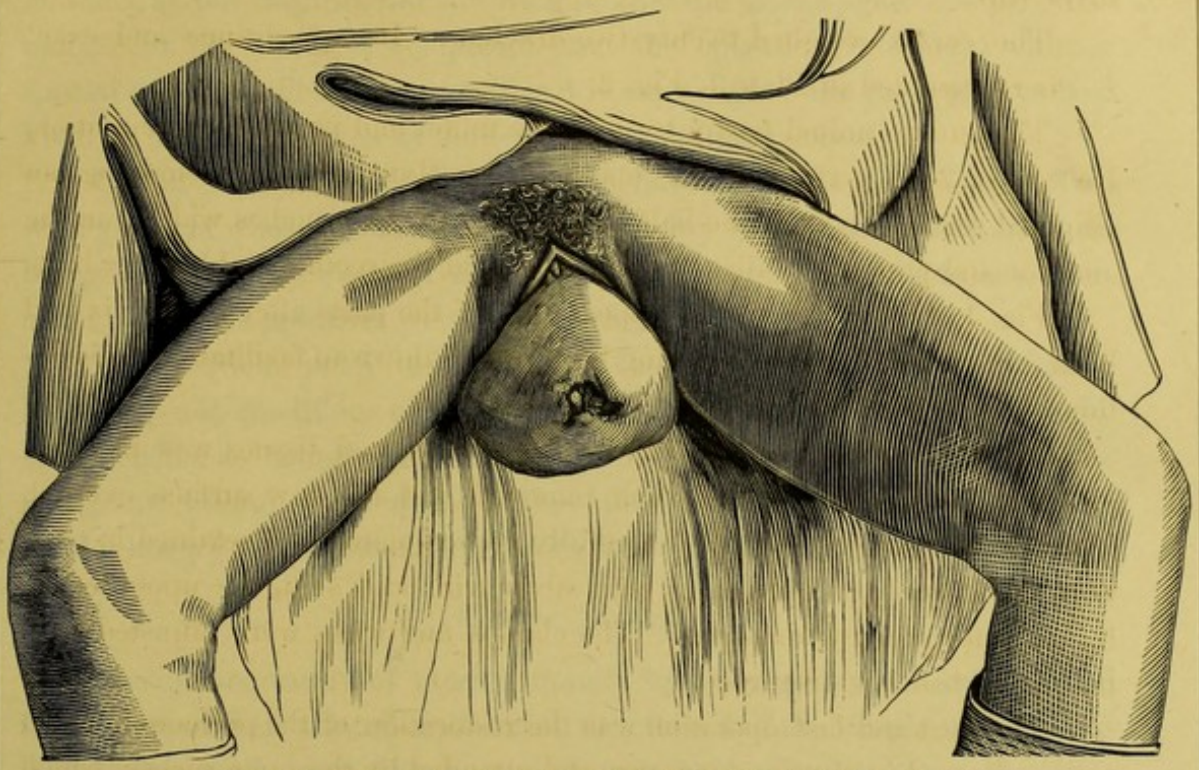
The next and last operation was the restoration of the perineum, which was performed in the usual manner, and attended by the same success which has always accompanied these cases.

It is seldom that one patient has to submit to so much surgery as this poor woman, and particularly in so short a time, but, from first to last, there was no evidence of the slightest constitutional disturbance, her pulse remaining below eighty per minute, skin cool, and appetite good. She slept well and complained of no pain; not one grain of opium, or its equivalent, was administered.

January 10.—Patient dismissed cured.

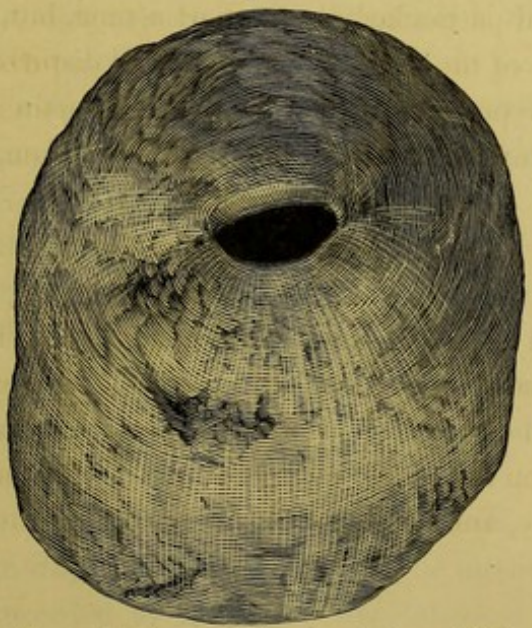
There have been fifty-seven cases of prolapsus uteri treated, about one-third of which were complicated with rectocele and cystocele; and the experience obtained in the treatment of these cases convinces me that, to effect a radical cure when the cervix is hypertrophied—the enlargement consisting of connective tissue, and irreducible by topical applications—it is necessary to

Fig. 1.



From a photograph of the patient three weeks after amputation of the cervix.

Fig. 2.



From a photograph of the cervix after amputation—exact size; weight twenty-two drachms.

amputate the whole of its vaginal portion, otherwise the vagina will yield, in time, to the disproportionate weight, and the uterus again escape externally. In the hands of competent men, the operation is fraught with no special danger. The pain attending it is very slight; the parts always heal kindly; and the function of the organ remains unimpaired.

In but three of the fifty-seven cases have pessaries been used. Two were patients whose advanced age forbade any interference, both of them being nearly eighty years of age; the third refused to submit to any operation. Hodge's pessaries were used in these cases.

In the article under the head of "Cancer" I refer specially to these hypertrophied conditions of the cervix, accompanied, as they always are, by endometritis, as being one of the principal, if not the principal cause of malignant disease of the uterus. This opinion, I believe, will be sustained by the history of patients afflicted with this terrible malady.

Uterine Tumors.

The nomenclature of uterine tumors has changed with our increased knowledge of their minute anatomical structure, and the simple term fibrous is now little used; myo-fibroma and myoma have taken its place, the latter term carrying us back to the "fleshy tubercles" of John Hunter.

Of the pathology of these growths much has yet to be learned, and, for this knowledge, we must look to such men as Rindfleisch, Stricker, Virchow, and Billroth. The active practitioner has time for little more than to glean from the labors of such men. It is not much he can contribute beyond the record of facts, which may assist in substantiating or disproving new theories, or occasionally, by well-timed hints, give direction to the thoughts and investigations of others.

The cases I have the honor to report under this head embrace almost every variety of tumor that has been described by authors, situated either in or on the uterus, and an abundant opportunity has been offered for testing every form of treatment that has been recommended for removal, either by extirpation or absorption.

Some of the cases reported were treated outside the hospital, having occurred among the out-door patients, who could be attended at their own homes, and are here recorded as adding to the statistical value of special forms of treatment.

Interstitial, Sub-peritoneal, and Sub-mucous Tumors of the Uterus.

Mrs. F——, aged forty-seven; colored; admitted to hospital, September 17, 1867; mother of five children, the youngest seven years of age. Since the birth of her last child she has suffered from pains in the back and groins, costive bowels, frequent and difficult micturition, and, during the last year, from repeated hæmorrhages, which have been exhaustive in character.

Her general appearance was that of a woman at full term, but unusually large. She measured fifty-nine inches around the abdomen at the umbilicus; and, to balance herself when standing or walking, the head and shoulders were thrown backward. Her features were pinched, and the face had an anxious expression; pulse 120, soft and compressible; respiration hurried; tongue slightly furred; appetite poor; and nights restless.

Physical examination.—The abdomen was occupied by a large tumor, extending from the pubes to within two inches of the sternum. Its outline was smooth and oval. Careful palpation gave evidence of fluid. The iliac fossa, on either side, was packed with intensely hard and immovable tumors about the size of small oranges. The finger, passed into the vagina, was arrested by hard masses, which felt like bony growths, completely filling the space between the pubes and sacrum. The whole mass was firmly wedged in the pelvis, no motion being imparted to the lower growths when the main tumor was lifted or moved from side to side.

The diagnosis was myo-fibroma of the uterus; the prognosis unfavorable, but it was determined that every effort should be made to prolong the life of the patient with the hope that if she lived through the climacteric period any further development of the tumors would cease, and they might degenerate and become atrophied.

The immediate indications were to arrest the hæmorrhages, and reduce the size of the principal growth by drawing off the fluid.

September 21.—A large-sized trochar was passed into the tumor immediately below the umbilicus, and a little over three pints of bloody serum withdrawn. No constitutional disturbance followed the operation, but it gave marked relief to respiration.

October 8.—Patient attacked with violent hæmorrhage, which was controlled by injecting the cavity of the uterus with a strong solution of perchloride of iron.

December 17 *and* 28.—Returns of the hæmorrhage, but in both instances it was readily controlled by the same means.

March 8, 9, *and* 10, 1868.—A slight bloody discharge, which required no treatment.

From the last date to the present time there has been no sanguineous discharge from the uterine passage; the size of the patient has diminished, measuring now but forty-seven inches around the umbilicus, and her general health and strength are good. She has been under continual observation the whole time, having been engaged since her convalescence as nurse in the colored ward of the hospital.

The treatment in this case has been to meet the immediate indications, and sustain the patient until the functional activity of the uterine system ceased, hoping and expecting that, with its cessation, the growth of the tumors would be arrested. The result has not disappointed the expectation.

Sub-mucous Fibroma of the Uterus.

M. R——, aged thirty-seven; colored; mother of four children; has always enjoyed good health. She seeks advice on account of hæmorrhages from the uterus, occuring every two or three weeks, which she has been informed were due to "change of life." She suffers no pain or any inconvenience beyond the debility attendant upon the loss of blood.

A digital examination showed the uterus to be three times as large as natural, intensely hard, but movable. The os and cervix were normal in appearance; the mammæ gave no evidence of pregnancy, and the woman's history rendered such a condition improbable. Nevertheless, it was considered advisable to keep her under observation for some time before making an exploration of the cavity of the uterus.

June 7, 1867.—Ten days after the first examination, the patient was attacked by a very severe flooding, which was arrested by plugging the vagina. Upon the removal of the plug, two days afterward, a sound was carefully introduced, and the cavity of the uterus, from os to fundus, found to measure six and one-fourth inches. The withdrawal of the sound was followed by a gush of blood, but further hæmorrhage was arrested by injecting the uterus with the tincture of perchloride of iron, diluted with an equal part of water. The patient was ordered thirty drops of the tincture of iron every four hours, and rest in the recumbent position.

June 28.—A small-sized carbolized sponge-tent was introduced into the cervical canal, and pushed beyond the internal os, which offered no obstruction to its passage. A suppository containing half a grain of morphine was placed in the rectum.

June 29.—The tent was removed, and a larger one introduced.

June 30.—Patient suffered some little pain during the night; pulse 90, and irritable. The tent was removed, and a larger size introduced. One grain of opium ordered to be taken every four hours.

July 1.—Tent removed, cervix well dilated. The left hand was placed upon the fundus, and the uterus pressed well down, when the second finger of the right hand, having been passed into the cavity of the uterus, discovered a sub-mucous tumor about the size of an orange and very hard. It was determined to cut through the mucous membrane and sub-mucous investing capsule, and endeavor to enucleate the mass. A round, pointed scalpel was guarded up to within half an inch of the point, and carried up to the fundus uteri. The womb having been kept steady by the downward pressure of the hand, as the scalpel was withdrawn, it was made to divide the capsule completely. A steel sound was next passed between the capsule and the tumor, and made to separate the tissues for some distance on either side of the incision; the vagina was plugged, and a full dose of opium administered.

July 2, 10 a. m.—Has had considerable pain during the night, and is now vomiting; pulse 120, hard and irritable; tongue slightly furred; no tenderness over the abdomen on pressure, except in the region of the bladder, which was full. Urine drawn by catheter, and cracked ice ordered to allay the irritability of the stomach; tampon allowed to remain, and three drops of Fleming's tincture of aconite with twenty of laudanum to be given every four hours.

July 2, 8 p. m.—Has passed a restless day; pulse still high and irritable; temperature 101; she complains of the vaginal plug causing her much discomfort; plug removed, and vagina washed out with a solution of carbolic acid. Twenty drops of Magendie's solution of morphine to be given at 10 p. m.

July 3, 11 a. m.—Patient complains of no pain, but is still restless and pulse high; the uterus a little tender on pressure. From this date to July 10th, the womb was washed out daily with a tepid solution of carbolic acid,

(five grains to the ounce,) and a suppository containing half a grain of morphine introduced into the rectum at night.

July 11.—Patient was placed upon her left side in the ordinary position for uterine examination, the speculum being held firmly by an assistant The os was as fully dilated as on the 1st instant, and the exposed portion of the tumor, which was readily felt with the finger, seized with a volsella, and drawn forcibly downward; an ordinary male sound was passed in, and much the larger portion of the tumor separated from its attachments.

The patient was not ætherized, and the operation gave her no acute pain; little blood was lost.

July 12, 9 a. m.—Pulse 100; patient very restless and uneasy; says she has continual bearing-down pains in her back and along the thighs; there has been no hæmorrhage during the night. Bowels to be moved by an enema, and a morphine suppository to be introduced at noon.

10 p. m.—Has had a very severe chill; eyes unnaturally bright; head aches; pulse 130; respiration hurried; temperature 102½. Irrigated uterus with a warm solution of carbolic acid for twenty minutes, and ordered one grain of quinine and half a grain of the watery extract of opium to be given every two hours.

July 13, 8 a. m.—Pulse 127; respiration still hurried; temperature 103; has passed no water; mind wandering; great restlessness; water drawn by catheter. The uterus again irrigated, and, after the water had drained off, applied pure carbolic acid to every portion of the uterine tissue that had been separated from the tumor; the application was made by a flexible silver sound charged with raw cotton. The administration of the quinine and opium to be continued, with the addition of a drachm of brandy every hour, and beef-tea *ad libitum.*

4 p. m.—But little improvement, except in temperature, which was reduced to 102½; treatment to be continued.

10 p. m.—Temperature 102; pulse 123; patient less restless, but complains of more pain.

July 14, 9 a. m.—Has slept for four hours; she appears much brighter and less restless; pulse 114; temperature 100½; uterus again irrigated; treatment continued.

10 p. m.—Patient has much improved; pulse 104; temperature 100.

July 15, 11 a. m.—Improvement continuing; quinine and opium to be given every four hours.

The improvement continuing to the 20th, all constitutional treatment was then discontinued.

August 2.—It was decided to separate what attachment still remained between the tumor and the uterus. The patient having been placed in position, the tumor was seized as before, but, upon passing the sound, it was found that the enucleation had been perfected, and the tumor was free in the uterine cavity. A firm hold was taken of the mass by a strong volsella, and steady traction made. Little resistance was offered by the uterus, and, in a short time, the tumor was withdrawn. The hæmorrhage was slight, and no unpleasant symptoms followed. As a prophylactic, one grain of quinine and one of opium were given every four hours, for two days, when further attendance was discontinued.

The tumor was examined at the Army Medical Museum, and found to consist entirely of connective tissue. Plate 8 represents its microscopical structure.

Myo-Fibroma of the Uterus.

H. L——; aged thirty-eight; colored; has never been married; general health always good until within the last year, during which she has suffered from repeated hæmorrhages, continuing, with more or less severity, for three and four days. These repeated losses of blood have somewhat reduced her strength, although she is still a powerful woman, of large frame, and very muscular.

She now complains of a bearing-down pain, and aching about the loins and along the thighs, profuse leucorrhœa, and irritability of the bladder.

Examination.—Conjoined manipulation revealed the uterus about three times its natural size, greatly retroverted; the sound passed into the cavity of the organ readily, measuring nearly six inches; blood followed its withdrawal.

A small-sized sponge-tent was introduced, the patient placed in bed, and a morphine suppository passed into the rectum.

March 15.—Patient has suffered no pain since the introduction of the tent. This was removed, replaced by a larger size, and the suppository repeated.

March 16.—She has had a severe chill during the night, and complains of headache and sharp pains in the abdomen; the removal of the tent



Microscopical appearance of sub-mucous myo-fibroma of the uterus removed from Mrs. M. R.

caused much pain. A full dose of morphine was administered by the mouth, and an anodyne suppository placed in the rectum; the abdomen was covered with a hot hop-poultice.

March 17, 10 a. m.—Has had another chill, which lasted longer than the first; pulse 128; respiration hurried; tongue covered with a heavy coating; knees drawn up; abdomen tender; temperature 102. It became evident that the woman suffered from metro-peritonitis, and Magendie's solution of morphine was ordered to be given every hour until pain ceased, unless its administration should be contra-indicated by the condition of the respiration, which was not to be allowed to fall below ten per minute. Brandy and beef-essence were ordered to be given at regular intervals, and the hop-poultice continued.

8 p. m.—Patient much easier, being completely under the influence of the narcotic; pulse 130; respiration 13; temperature 103½.

March 18, 8 a. m.—No improvement in her general condition; her respirations had been reduced to twelve per minute, but the pulse had increased to 140, and the temperature to 104; abdomen tympanitic; no complaint of pain. The morphine was ordered to be reduced, and one grain of quinine and a teaspoonful of brandy to be given every hour.

March 19, 9½ a. m.—Pulse 140; temperature a little over 104; mind wandering; patient rapidly failing.

11 p. m.—No improvement. She died at 2 a. m. on the 20th.

Sectio cadaveris thirty-eight hours after death.—Body not emaciated; rigor mortis not well marked; head not examined. Thorax—adhesion of left pleura, evidently of long standing; lungs generally healthy, but some solidification of the lower lobe of left lung. Heart healthy, as also abdomen and liver; left kidney nearly twice the normal size, and intensely congested.

There were about seven ounces of sero-purulent fluid in the peritoneal cavity. The uterus was adherent posteriorly, and, upon its removal, found to weigh eight ounces and five drachms. A tumor, myo-fibroma, was imbedded in its posterior wall. In making the section through the uterus the knife was followed by greenish-yellow, stinking pus; the tissue was unusually soft.

Commentary.—The metro-peritonitis which destroyed this patient was undoubtedly caused by the sponge-tents. It was the first instance which had occurred in my own practice where any serious consequences followed

their use, but unfortunately not the last, as more than one of the following cases will show. The intense inflammation excited in this instance was not occasioned by the admission of air into the uterine cavity, for every care was taken to prevent that accident. How much of the unfortunate termination may have been due to the pre-existing disease of the kidney cannot be estimated.

But however much the general condition of the patient may have assisted in bringing about the fatal issue, it cannot be denied that the sponge-tents proved to be the exciting cause. They are indispensable in the treatment of uterine diseases, but are by no means the simple agents they are generally supposed to be. Like other potent remedies, they should be used with great care and circumspection.

Myo-Fibroma of the Uterus, complicated with Pregnancy.

August 17, 1869.—M. S——; aged thirty-two; colored; mother of two children, the younger of whom was seven years of age. About one year after the birth of her last child she noticed a hard tumor on the left side of the abdomen, which increased in size from year to year, while others had made their appearance on the right side. She had suffered little inconvenience from them; her menstrual periods had been regular until the last three months, and the discharge normal; she had experienced no hæmorrhages.

She sought advice principally on account of the stoppage of her monthly periods, which was attributed to a cold taken about three months previously

Examination showed a mass of sub-peritoneal tumors surrounding the uterus, which appeared imbedded in them. It was difficult to estimate the size of this organ, but as near as could be ascertained it was as large as at the sixth month of pregnancy, and very hard. It was well advanced in the cavity of the abdomen, the finger with difficulty reaching the os.

The nipples gave unmistakable signs of pregnancy, and, from the history of the case as given by herself, it was decided that she had progressed to a period between the third and fourth months of gestation.

The question arose as to what was best to do in the premises. If her pregnancy should be allowed to continue, the tumors would increase with the functional activity of the uterus, and it was highly improbable, indeed impossible, that she could go her full time and give birth to a living child

After mature deliberation it was decided to puncture the membrane and induce premature delivery.

Instead of puncturing, a piece of catgut about nine inches long, and as thick as fine pack-thread, was moistened and passed into the uterus, to the lower portion of which was attached a piece of strong thread which was left hanging out of the vagina, to secure its easy removal in the event of provoking too violent contractions.

Strong labor-pains commenced in about eighteen hours, and continued over two hours, when she was delivered of a fœtus with the membranes entire.

Recovery was rapid, no unpleasant symptom occuring during her convalescence.

After complete recovery she was placed upon full doses of the iodide of potassium, pushed to tolerance, and continued for six months without appreciable diminution in the size of the growths. Bromide of potassium and iodine were faithfully tried with the same effect. The increase of the tumors has continued slowly but surely.

Operative interference in this case was out of the question; nothing short of the removal of the uterus would have been of any use, and the symptoms up to this time have not been sufficiently urgent to justify so formidable an operation.

The probabilities are, that the tumors will steadily increase until the climacteric period, when it is hoped that further growth will be arrested, and they will undergo calcareous degeneration or gradual atrophy, as in the first case reported under this head. If, on the contrary, they should become sufficiently large to jeopardize the patient's life, by mechanical interference with the abdominal and thoracic organs, the whole mass will be removed unhesitatingly as a dernier resort.

Fibrous Tumor attached to the Fundus of the Uterus mistaken for Inversion.

Martha M——; aged fifty-seven; admitted to Columbia Hospital June 18, 1871; mother of eleven children; was sent to the hospital by a physician in the country, who diagnosed the case as one of irreducible inversion of the uterus. The patient stated that, at the birth of her last child, which was seven years of age, she suffered from a severe flooding that nearly cost her her life, fol-

lowed by an almost continuous hæmorrhage for several days, eventually controlled with much difficulty. From that time she noticed a tumor occupying the entrance to the vagina, which, when pushed up, came down again immediately, and occasionally, when in a stooping position, would project externally, and remain in that state until returned; several pessaries had been introduced, but she was unable to retain them on account of the severe pain they occasioned. She suffered from pain in the loins, difficult micturition, and costive bowels. The vulva and inside of thighs were constantly bathed with an ichorous discharge, which chafed the parts and caused much discomfort.

A careful examination showed the vagina filled by a moderately solid body, pear-shaped, and covered by a mucous membrane, which, upon examination under the microscope, proved to be decidual in character.

The patient having been placed in position, the vagina was exposed by Sims's speculum, the tumor drawn downward, and an attempt unsuccessfully made to introduce a sound into the uterus. A digital examination was made per rectum, but the uterus could not be discovered. The finger while in the rectum came in contact with the point of the sound in the anterior *cul-de-sac*. The sound, passed into the bladder and pressed backward, came in contact with the finger in the rectum, and the spot where the uterus should have been was marked by a depression answering to the abdominal ring.

The differential diagnosis between fibroid tumor and inversion of the uterus seemed perfect—manipulation failed to reveal any uterine body in situ. The probe was arrested at the neck.

From the statement of the patient the tumor immediately followed parturition, and was accompanied by severe and protracted hæmorrhage. Every symptom of inversion was present; there seemed nothing wanted to render the diagnosis clear, and the opinion of the medical gentleman who sent her to the hospital was confirmed.

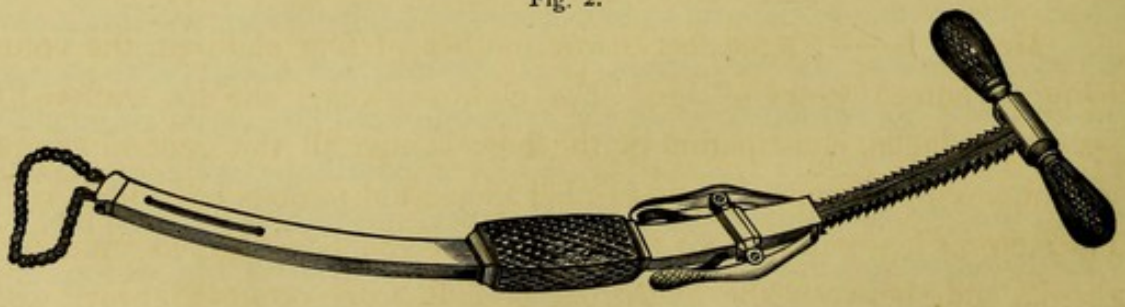
The patient having been fully ætherized, an attempt was made to reduce the inversion, but it was found impossible, and it became a question which of the two alternatives to adopt, to leave it unreduced, or to remove it with the écraseur. As she was still the subject of frequent exhaustive hæmorrhages, and experienced great personal inconvenience from the presence of the

Fig. 1.



Fibrous or connective-tissue tumor removed from the fundus of the uterus. Exact size. Photographed on wood.

Fig. 2.



Curved écraseur, used for the removal of uterine tumors.

tumor, and the offensive and acrid discharge to which it gave rise, it was decided, with the consent of the patient, to remove it.

The danger attending the operation was fully explained to the woman, and the choice given her of palliative treatment or the removal. She decided to take the risk of the operation for radical cure.

Patient being fully ætherized, two stout, curved needles were passed through the top of the pedicle to prevent the surrounding tissue being drawn into the chain of the écraseur. The chain was then carefully adjusted and tightened; it was allowed to cut but very slowly, fifteen minutes being occupied in cutting through the mass. Upon its removal, to the astonishment of all, it was found to be a fibrous tumor that had been attached to the fundus of the uterus.

The uterus was so atrophied that there was but a mere trace of it, measuring less than one inch from os externum to fundus; its walls were extremely thin, and rectal and recto-vesical manipulation failed to discover its existence. Figure 1, plate 10, shows the appearance of the tumor subsequent to removal, being the exact size after six hours' immersion in alcohol.

The error in diagnosis in this case could not be avoided; every care was taken to prevent it. The mistake was evidently due to the atrophied condition of the uterus, which was caused by the supply of blood having been mainly consumed by the tumor. This tumor undoubtedly was extruded with the child, and its presence, preventing complete contraction of the uterine walls, was the cause of the flooding.

Only a few drops of blood were lost in the operation. The patient recovered rapidly, and left the hospital in about two weeks.

Large Sub-muco Fibrous Tumor of the Uterus.

Mrs. A. I——; aged forty-two; mother of four children, the youngest being seventeen years of age. For eighteen years she has suffered from severe headache, constipation of the bowels, and all the general symptoms accompanying chronic dyspepsia; her menstrual periods have been regular, but more or less painful; for two years past she has suffered from menorrhagia, and, between the menstrual periods, from profuse leucorrhœa, the discharge being always discolored with blood. The general appearance of the patient was that of a person well nourished, but with an expression of countenance indicative of pain and anxiety.

Examination made July 18, 1870.—Abdomen much enlarged; the womb hard and about the size of a gravid uterus at full term; cervix obliterated; the os fully dilated and occupied by a smooth, round tumor, feeling like a fœtal head. The sound passed in front of the tumor, but posteriorly there was no sulcus; a whalebone probe, armed with a button, was passed in to the extent of eleven inches before reaching the fundus. A thorough examination satisfied me that the tumor was sub-mucous, and composed mainly of connective tissue, and entirely separable from the body of the uterus. I recommended that the mucous and sub-mucous tissues covering the tumor should be divided and separated from it by a strong steel sound, trusting to the contractions of the uterus for its complete enucleation.

The patient declined submitting to any surgical interference, and went to New York, where she consulted Dr. G. Thomas, who confirmed my diagnosis, and recommended the treatment which I had proposed.

Upon her return to the city she again came under my care, but concluded not to submit to any operation, and the only treatment pursued has been to meet the indications, arresting hæmorrhage, and soothing pain when severe. The tumor has grown but little during the last year, and but little hæmorrhage has occurred. In the absence of an operation for removal, the only hope in this case is, that with the change of life all further growth will cease, and the tumor undergo some retrograde metamorphosis by which it will become atrophied.

Fibroid or Connective Tissue—Tumor attached to the Fundus of the Uterus—Death from Tetanus.

M. S——; aged twenty-three; white; admitted January 13, 1868; married when nineteen years of age; has given birth to two children, the youngest of whom is eleven years of age. Her general health has been bad, and, living in a malarious region, she has suffered, in spring and fall, from protracted attacks of intermittent fever. For the two preceding years her menstrual periods have been irregular, sometimes returning but once in three or four months; and there has been a constant sanguineo-purulent discharge from the vagina. She complains of pain in the back and loins; the slightest exertion produces vertigo and nausea. Her general appearance is unhealthy; skin of a dirty

waxen hue; lips almost colorless, and face bloated; pulse feeble and rapid; hands cold; tongue and mucous membrane of mouth pale.

Examination.—The vagina was relaxed, uterus low down, and os patulous, through which the sound passed readily, to the extent of four and three-quarter inches. A small polypus could be seen about half an inch within the cervical canal. The cause of the enlargement being obscure, it was decided to dilate the canal. A medium-sized sponge-tent was introduced without difficulty, and a suppository, containing half a grain of morphine, ordered to be placed in the rectum if the patient should experience much pain.

January 14, 11 a. m.—She suffered severely during the night; the suppository was used as directed, and forty drops of Magendie's solution of morphia administered, but with little effect. The tent was removed with some difficulty, having been held firmly by the internal os, beyond and below which the sponge had fully expanded. The part, however, embraced by that portion of the cervical canal was scarcely larger than before the introduction of the tent.

7 p. m.—Patient very restless; complained of pain in the back, extending to the neck; headache and chilliness. Hot bottles were placed to the feet, and a full dose of opium administered, with orders to repeat it during the night if needed.

January 15, 6 a. m.—Complained of oppression about the epigastrium and stiffness in the back of the neck; had not slept since the tent was introduced. Thirty drops of Magendie's solution to be administered hypodermically.

11 a. m.—The morphine had produced no effect. There was difficulty in opening the mouth and in swallowing; respiration labored; pulse 100; temperature 104. Ice was ordered to be applied to the spine, and the dose of morphine to be repeated.

6 p. m.—Muscles of the jaws firmly contracted; breathing labored; face anxious. She experienced difficulty in turning upon her side, requiring the assistance of the nurse. Extract of cannabis indica (Squibbs) in half-grain doses ordered to be given every two hours, and the ice application to be continued.

11 p. m.—Has had two spasms since nine o'clock, the last one very severe; treatment to be continued.

January 16, 9 a. m.—Patient much worse; the spasms had been very frequent during the night, and of increased violence. Opisthotonos well marked; pulse 118; thermometer 105½.

10 p. m.—The spasms had been unremitting; all the other symptoms aggravated; no change in the treatment advised; prognosis, grave.

January 17, 11 a. m.—Patient failing rapidly; with difficulty kept in bed during spasm; the opisthotonos very extreme; deglutition impossible. She died at 3 p. m.

Sectio cadaveris forty-three hours after death.—Thoracic organs healthy. Abdomen: spleen large, soft, and of a pale bronze color; liver pale, but otherwise healthy. Uterus three times its normal size, but no evidences of inflammation in the organ, or any of the tissues connected with it. Its cavity was occupied by a tumor attached to the fundus, which readily shelled out when the investing capsule was divided. The internal os was surrounded by fibres as unyielding as cartilage.

Commentary.—The traumatic tetanus from which this woman died was caused by the irritation produced in the effort to dilate the cervical canal. Had the fibres of the internal os been divided before the introduction of the tent, the probabilities would have been in favor of her recovery without tetanic symptoms.

The accident in this case, as in others, which have unfortunately occurred in my practice as well as in that of my professional brethren, has induced me, in all cases where the employment of a sea-tangle or sponge-tent is indicated, first to divide the fibres around the internal os. Since the adoption of this plan I have had no trouble following their use.

The treatment pursued in this case after the alarming symptoms of tetanus supervened was regarded as the most eligible under the circumstances, combining as it did the two remedies from which the best results have been usually obtained.

Professor D. W. Yandell, of Louisville, published in the Practitioner an analysis of a report on tetanus, by Dr. R. O. Cowling, showing the relative merit of different methods of treatment. The following is a summary of that analysis, which embraces acute and chronic cases. The value of the percentage must be considered in relation to the number of cases reported as having been submitted to the different methods of treatment. Acute is the

term applied when the symptoms occurred within nine days after the injury, and chronic when they were not developed until after that time:

"Calabar-bean was given in thirty-nine cases with thirty-nine per cent. of recoveries. Of these reported cases, but one was of acute tetanus; five others were cases which recovered before the expiration of fourteen days. Per contra, there were ten deaths from chronic tetanus.

"Indian hemp used in twenty-five cases, with sixty-four per cent. of recoveries, of which three cases were acute, and six recovered before the symptoms lasted fourteen days.

"Chloroform relieved seventy per cent. of thirty-five cases, nine of which were acute, and eight recovered before fourteen days. Three chronic cases died, and two after the symptoms lasted fourteen days.

"Æther: sixty per cent. of fifteen cases recovered; five acute; seven inside of fourteen days; one chronic case died.

"Opium: fifty-seven per cent. of one hundred and sixty-five cases recovered; twenty-two acute; twenty-nine before the fourteenth day. Twenty-six chronic cases were lost, and four after the disease had continued fourteen days.

"Tobacco relieved fifty per cent. of forty-one cases; six acute; six before fourteen days of the disease. Four chronic cases died, and one after fourteen days.

"Quinine: seventy-three per cent. of fifteen cases recovered; one acute; three before fourteen days. Three chronic cases ended fatally, and one after fourteen days' duration.

"Aconite: eight per cent. of fourteen cases recovered, none acute; none recovered before fourteen days. Death in one chronic case.

"Stimulants: eighty per cent. of thirty-three cases recovered; four acute; six within fourteen days. Six chronic cases died, and three after fourteen days.

"Mercury: fifty-seven per cent. of seventy-five cases got well, twelve before fourteen days. Seventeen chronic cases were lost, and two after fourteen days.

"Bleeding: fifty-five per cent. of fifty-eight cases recovered; nine acute; ten before the fourteenth day. Seven chronic cases were lost, and two after fourteen days.

"Cold affusion: seventy-three per cent. of eleven cases recovered; three acute; three before fourteen days. Two chronic cases died.

"Ice-bags: seventy-seven per cent. of nine cases recovered; one acute; two in less than fourteen days.

"Amputation: sixty per cent. of seventeen cases recovered; four acute; four in less than fifteen days. Three chronic cases died, and one after fourteen days.

"Division of nerve relieved seventy-five per cent. of three cases; one acute; one before the fourteenth day. One chronic case died.

"Purgatives: sixty-six per cent. of seventy-four cases recovered; thirteen acute; twelve before fourteen days. Ten chronic cases died, and three after fourteen days.

"Turpentine relieved seventy per cent. of sixteen cases; six acute; four before fourteen days. Five chronic cases died, and two after fourteen days."

In commenting upon this analysis, Professor Hammond says:

"Among the conclusions arrived at by Dr. Yandell from these data are: That recoveries from traumatic tetanus have been usually in cases in which the disease occurs subsequent to nine days after the injury; that when the symptoms last fourteen days, recovery is the rule, and death the exception, apparently independent of the treatment; that chloroform, up to this time, has yielded the largest percentage of cases in acute tetanus; that the true test of a remedy for tetanus is its influence on the history of the disease. Does it cure cases in which the disease has set in previous to the ninth day? Does it fail in cases whose duration exceeds fourteen days? and that no agent tried by these tests has yet established its claims as a true remedy for tetanus."

Intra-mural Myo Fibroma.

Mrs. C. R——; aged forty-two; married; has never borne children. She menstruated at eleven years of age, and became a wife at thirteen. From her history, as given by herself, she was fully developed at the time of her marriage. She enjoyed good health until her thirty-fifth year, when her menstrual periods became irregular, returning every ten days or two weeks, and attended by severe menorrhagia. About one year after this she noticed a tumor the size of an orange in the lower part of her abdomen, not painful,

but nevertheless giving rise to much anxiety. From that time until my advice was solicited, the tumor had steadily increased in size.

The general appearance of the patient was anæmic and emaciated, her abdomen as large as a woman's at the full term of pregnancy; the veins of the left leg were varicose.

Examination.—The cavity of the pelvis was occupied by a large tumor, regular in outline, in size and shape like the gravid uterus; it extended from the pubes to within two inches of the ensiform cartilage, and laterally to the same distance from the rim of the pelvis.

Palpation gave evidence of fluid in the most prominent part of the tumor.

Digital examination of vagina and rectum.—The roof of the vagina was hard and unyielding; the cervix small and pushed over to the right side; the rectum less obstructed than usual under such conditions. Simpson's sound passed into the uterus readily for about four inches, its direction being backward with a strong curve. It was withdrawn, and one of Thomas's sounds introduced, (a thin piece of whalebone with a rounded top the size of a buckshot,) which passed up to the extent of ten and one-half inches. The diagnosis was myo-fibroma, developed interstitially in the fundus and anterior wall of the uterus, a portion having undergone cystic degeneration.

The trochar was introduced into the most prominent part of the tumor, and twenty-one ounces of bloody serum withdrawn.

It was decided to keep the patient under observation and meet indications as they might occur. As the menses returned every two weeks, each succeeding period was anticipated by an injection of the diluted tincture of the perchloride of iron into the uterine cavity. Bromide of potassium, to the point of toleration, combined with the syrup of the bromide of iron, was given for twelve months with the most marked benefit.

The tumor did not increase; the patient improved in strength, gained flesh, and was cheerful; and her menstrual periods diminished in frequency and duration until March, 1872, when they ceased altogether.

Commentary.—Myoma or myo-fibroma of the uterus, developed interstitially, rarely warrants surgical interference. Cases may possibly occur which justify such a procedure, but the statistics are most decidedly in favor of non-interference beyond mere palliative measures—such as arrest of

hæmorrhage by the local application of astringents, tapping where practicable to relieve pressure, and keeping the patient as nearly at par as possible.

The bromide of potassium was given in this case as a sedative (which I believe it to be) to the uterine system, and not with the hope that it would cause absorption of any portion of the already organized matter. Its effect in conjunction with the astringent injections fully realized the expectation.

Sub-mucous Fibroma.

Mrs. I. R——; admitted as out-door patient February 7, 1871; colored; aged thirty-six; married; has had seven children. She enjoyed good health until two years ago, since which time she has suffered from a sanguineo-purulent discharge from the vagina, pain in the back and loins, and nausea.

Examination per vaginam.—Os patulous and eroded; the cervical canal filled with thick, chocolate-colored, offensive discharge. The sound passed in five and three-quarter inches, and, although used with great care, gave considerable pain. The finger introduced into the posterior cul-de-sac came in contact with a firm, well-defined tumor, apparently occupying the posterior wall of the uterus, and imbedded in the lower part. Conjoined manipulation revealed the correctness of the digital examination.

A medium-sized sponge-tent was readily introduced past the internal os, and allowed to remain twenty-four hours.

February 8.—Os moderately well dilated; tent removed, and one of larger size introduced, and a morphine suppository placed in the rectum as a precautionary measure.

February 9.—Tent removed; its withdrawal followed by considerable quantity of offensive matter; no constitutional disturbance whatever. The finger passed readily into the uterus and came in contact with a well-defined sub-mucous tumor in the posterior wall. A free incision was made through the mucous membrane and intervening tissue down to the tumor; but, after repeated efforts, it was found impossible to separate the growth from the layers of tissue investing it. It was undoubtedly a myo-fibroma, the fibres of which were intimately interlaced with those of the proper tissue of the uterus, and an attempt at enucleation, as in Case No. 2, it was presumed would result disastrously. It was determined to increase the depth of the incision, and introduce into the wound a piece of raw cotton soaked in pure carbolic acid. The incision was increased to one inch in depth, and the

opening filled with carbolized cotton. A suppository containing one grain of morphine was introduced into the rectum.

February 10.—Patient feels well; slept all night; has a little soreness over the pubes.

February 11.—Pulse 100; severe pain in the back and loins; nausea and headache. One grain of the watery extract of opium to be given every four hours.

February 12.—Pulse 120; respiration hurried; she complains of severe pain in the abdomen and back; temperature 98; opium to be continued.

February 13.—Pulse 114; respiration easy; less pain; temperature 98. The speculum was introduced, and the os found almost as open as on the 9th instant; a copious sanguino-purulent discharge was flowing from it.

The piece of cotton was removed easily, and the cavity of the uterus syringed out with tepid water and carbolic acid.

From this time onward the tumor slowly melted away. The discharge was excessive and very offensive; the uterine injections were continued, daily, and the patient's strength sustained by nourishing diet, bark, and iron.

On the 8th of April she left the city for California. The tumor at that time had become reduced to less than one-third the size it was when operated upon, and the probabilities are that it eventually disappeared, but, not having heard from her since she left, nothing positive can be said about it.

Large Intra-mural Tumor of Uterus.

Mrs. A. S——; admitted June 7, 1871; aged forty-nine; German; married; mother of four children, the youngest eight years of age. Her recovery from each labor was rapid and perfect; her general health has always been good. She ceased to menstruate at forty-five years of age, since which time she has noticed a tumor in her abdomen, which has increased rapidly within the last two years, and is now as large as the gravid uterus at the sixth month. She has suffered from no hæmorrhages, but complains of some pain in the back, and weariness upon the slightest exertion. Her bowels are regular, and all the functions appear to be performed normally.

Examination per vaginam.—Os patulous; sound measures nine and one-

quarter inches. It could be readily felt through the abdominal walls when pressed forward, showing the mass of the tumor to be in the posterior wall.

Surgical interference in this case appeared unwarrantable, but it was a fair case for a trial of the effect of medication. She was ordered the one-sixteenth of a grain of the bichloride of mercury, and five grains of the iodide of potassium, to be taken three times daily; the abdomen to be supported by an India-rubber belt.

No disturbance of digestion resulted from the use of the iodide, and it was continued uninterruptedly for more than six months, but with no apparent diminution in the size of the growth. It was then discontinued, and forty grains of the bromide of potassium given three times daily. This was borne well, and continued as long as she remained in the city, or until the following May, when she left for Germany.

At the time of leaving she appeared in perfect health, the tumor being about the same size as when she first came under my care.

Commentary.—The prognosis in this case was not as favorable as it would have been had the woman been younger, and the tumor made its appearance before the climacteric period. It was the first case that had come under my observation where a tumor of such large size had been developed after the cessation of the functional activity of the uterine system. I doubt very much if the medication exerted any special influence upon its growth, and am disposed to believe that in the reported cases of the disappearance of fibroid tumors of the uterus under the use of mercury, iodine, or bromine, there has been an error of diagnosis, and that the enlargement was not due to a new growth, but to a hypertrophy of the muscular tissue of the uterus, which is undoubtedly amenable to medication.

Large, Soft Polypus of the Uterus.

Mrs. C. McC——; admitted March 14, 1870; aged forty; mother of five children, the youngest fifteen years of age. She complained of pain in the back, and profuse leucorrhœa; had suffered within the last year from several severe hæmorrhages, which lasted from four to five days.

Examination showed the uterus to be as large as a full-sized fœtal head; manipulation gave no pain. The sound measured only three and one-half inches, and did not come in contact with the fundus uteri, but with a yielding body, which was diagnosed as a soft polypus.

The os being small, a sea-tangle-tent was first introduced. This was removed in twenty-four hours, and replaced by a medium-sized sponge-tent, which was allowed to remain the same length of time. Six hours before its removal considerable pain was experienced by the patient, which she described as being similar to labor-pains. Upon the removal of the tent the os was found well dilated, and much shortened, and a soft body could be distinctly felt pressing down, not unlike the fœtal membranes.

The pains continuing, one teaspoonful of the saturated tincture of ergot was administered every half-hour, until decided uterine contractions were established, which lasted more than twenty-four hours, and then suddenly ceased.

Upon examination, the vagina was found full of a soft friable mass, but so firmly packed that the finger could with difficulty pass around it. It was broken down with the placental forceps, and brought away by piece-meal, until its attachment to the uterus was reached. The pedicle was found to be broad and much firmer than the bulk of the tumor; it was firmly seized by a volsella, and encircled with a chain-écraseur. Its separation occupied twenty-seven minutes. The entire mass weighed nineteen ounces.

The part to which the tumor had been attached was smeared with pure carbolic acid, and two grains of opium administered.

There having been no hæmorrhage during the removal of the tumor, it was considered unnecessary to insert a tampon into the vagina, but the nurse was instructed to watch the patient closely, and "notify the house-surgeon" if any bleeding should be discovered.

A rapid recovery was made; no complication occurring to interfere with convalescence.

Glandular Polypi.

S. R——; admitted June 17, 1871; unmarried; seamstress; has never enjoyed good health, having suffered since she was fifteen years of age from menorrhagia, almost continuous headache, pains in the back, and leucorrhœa. When quite young she was employed in a factory at Lowell, and from her statement was hard-worked, poorly fed, and badly housed.

Upon examination the vagina was found relaxed; the os uteri patulous, eroded, and filled with dark tenacious mucus. The cervix yielded to im-

mediate dilatation, and two glandular polypi were seen attached to the lower portion of the canal.

Her general condition being one of extreme debility, it was thought best to place her upon constitutional treatment before interfering with the uterine ailments. She was placed upon generous diet and tonics; iron, quinine, and strychnine having been administered. Her recovery was slow, but perfect.

October 10.—The condition of the uterus much the same as when the patient was admitted. A sponge-tent was introduced, and, upon removal, replaced by one of a larger size; the object being to destroy the polypi by pressure. This was accomplished perfectly, and the patient dismissed, November 7th, cured.

There have been ninety-seven patients in the Institution for various forms of uterine tumors. About eighty per cent. of those generally classified as fibroid growths, which include myo-fibroma, myoma, and connective-tissue growths, have occurred in colored women.

The experience obtained from this limited number of cases leads to the following conclusions:

First. When the growths are sub-serous or interstitial, operative interference is inadvisable, unless they reach such proportions that by their mechanical interference with the pelvic organs life is jeopardized.

Secondly. That after the climacteric period has been passed, further increase in size is the exception, and atrophy by absorption or retrograde metamorphosis the rule.

Thirdly. When the tumors are sub-mucous, and but loosely connected with the normal tissue of the uterus, they can be safely removed, if the patient is properly prepared, and the operation carefully conducted.

Fourthly. Absorption of the tumor cannot be accomplished by alteratives or any known system of medication; and when tumors disappear during a course of treatment of this character, it is a coincidence, and not owing to the effect of the drug or drugs administered.

Fifthly. That the large majority of cases reported as cured by the persistent administration of mercury, iodine, bromine, or medicinal waters were in reality not adventitious growths, but simple hypertrophy of the proper tissues of the uterus.

Subinvolution of the Uterus.

A hospital devoted specially to the treatment of diseases peculiar to women must necessarily receive a large number of patients suffering from subinvolution of the uterus, a condition to which the poorer classes are peculiarly liable.

The uterus in its unimpregnated condition measures three inches, and weighs but a few drachms. In the short period of a natural pregnancy it has increased to several pounds in weight, and may be sufficiently enlarged to contain two or more children. After delivery this mass of tissue undergoes retrograde metamorphosis or fatty degeneration, and, if this physiological process is uninterrupted, it returns to nearly the same size it was before impregnation. Many circumstances are likely to occur, however, to interfere with this process of involution, most frequent of which is metritis, acute or sub-acute, and insufficient contraction following the expulsion of the child. Either of these may be excited by a general toxæmic condition of the blood, dependent upon the presence of more effete matter than the emunctories can eliminate; too early exertion after delivery; coition before the complete restoration of the uterus; depriving the patient of sufficient nourishment during the first ten days following delivery; excessive hæmorrhage or any one of the many accidents likely to occur during parturition.

Subinvolution of the Uterus.

Case 1.

Mrs. R. Z——; admitted October 14, 1866; aged thirty-five; mother of eight children, the youngest seven months old. The eight children were born in ten years and two months, and all were single births. Her labors have always been rapid, three or four violent pains expelling the child and placenta. She had never suffered from after-pains, and usually was up and attending to her household matters in six or seven days; but, since the birth of the last child, she had been unable to move around with any comfort She complained of debility, nausea, want of appetite; suffered from bearing-down pains, pains in the back, and profuse leucorrhœa.

Upon examination the uterus could be felt above the pubes, much enlarged. By digital examination *per vaginam*, the os was found patulous, readily admitting the end of the index-finger; the cervix was large, but soft; the sound measured six and one-quarter inches from os to fundus. Its intro-

duction, although unobstructed, gave considerable pain. The body of the uterus was abnormally soft. Speculum examination: os eroded; the upper part of the vagina covered with ill-conditioned pus, which was flowing from the cavity of the uterus. The diagnosis was subinvolution, with chronic endometritis.

Treatment.—The child was weaned immediately, and the patient placed upon extra diet, with four ounces of sherry-wine daily. The hot douche was applied to the uterus morning and evening, followed by the introduction of a pledget of raw cotton soaked with glycerine. An application of pure carbolic acid was made weekly to the lining membrane of the uterus, and one-thirtieth of a grain of strychnine with five grains of the citrate of quinine and iron administered after each meal.

Under this treatment she gained rapidly, and at the expiration of three months the uterus had become reduced to one-half its excess, and the discharge had entirely ceased. The same treatment was continued, with the addition of electricity.

April 17, 1867.—The patient was discharged. The uterus had nearly regained its normal size, and her general health was excellent.

Commentary.—The want of involution in this case was owing to excessive fecundation and insufficient food and rest after parturition. The necessary sequence of this combination was atony of the uterine muscular fibres. The endometritis was caused by the atony permitting the retention of blood within the sinuses, and thus interfering with the circulation.

Cases of this nature cannot be treated successfully unless the patient is in comfortable circumstances, or can have the advantage of a well-regulated hospital. The hygienic treatment is as essential as the specific medication.

Subinvolution of the Uterus.—Amputation of Cervix.

CASE 2.

Mrs. H. B——; admitted October 18, 1866; aged twenty-seven; German by birth; mother of two children, the younger seventeen months of age, and still nursing. Patient complains of pain in the loins and between the shoulders, leucorrhœa, constipation, and loss of appetite. For the last six months her eyes have pained her at night, and she has experienced difficulty in reading ordinary print. Her nights are restless.

Examination.—Uterus low down; cervix large and hard; os patulous; the whole organ much enlarged and very tender. The vagina was relaxed,

and incapable of affording any support to the uterus; perineum ruptured. The retina of both eyes congested.

Treatment.—The child was taken from the breast, and both mammæ were covered with belladonna plaster to arrest the secretion of milk. To regulate the bowels, a suppository containing one grain of the English extract of belladonna was introduced into the rectum at night, followed in the morning by an injection of three pints of tepid water. No medical attention was directed to the uterus for two weeks, it having been considered advisable to allow the patient rest before commencing any special treatment.

November 4.—Four leeches were applied to the posterior cul-de-sac, followed by the hot-water douche, and the interior of the uterus was swabbed out with a solution of the nitrate of silver, (twenty grains to the ounce.)

The hot-water douche was continued, having been used twice daily, and the nitrate of silver application made to the uterine mucous membrane weekly. One drachm of the sirup of the phosphate of iron, quinine, and strychnine was taken after each meal.

The recovery in this case was slow, the body of the uterus yielding more readily than the cervix, which remained indurated, and was finally amputated; no flap having been formed, the stump was allowed to heal by granulation.

February 8, 1867.—Perineum restored.

March 15.—Patient dismissed cured.

Subinvolution of the Uterus.—Amputation of Cervix

Case 3.

Mrs. C. C——; admitted October 28, 1866; aged thirty-one; American by birth; married when sixteen years of age; mother of seven children, the youngest of whom was four years of age. Since the birth of her last child she has had six miscarriages, each one occurring between the second and third month.

She complained of pain low down in the back, extreme debility, leucorrhœa, menorrhagia, headache, and indisposition for exertion of any kind.

The uterus was found low down, and twice or thrice its natural size. Cervix much enlarged, and os patulous, giving exit to an offensive discharge of a brownish-yellow color. The posterior lip was hard and nodulated. The sound passed in four and one-half inches.

Treatment.—Rest in the recumbent position, chalybeate tonics and nourishing diet. Locally, chromic acid was applied to the interior of the uterus

once a week, and a pledget of cotton soaked in glycerine (Price's) inserted into the vagina daily.

Under this treatment the body of the uterus became reduced in size, the patient gained strength, and the leucorrhœa diminished, but the cervix remained large, and the hardness increased rather than diminished.

January 5.—The whole vaginal portion of the cervix was amputated by flap-incisions, and the flaps brought together with silver wire; they united by first intention, and the patient was dismissed February 17, 1867, cured.

Cases of this description are most likely to invite malignant disease. Had this woman continued without surgical treatment, the probabilities are that she would ultimately have been attacked with corroding ulcer or epithelioma of the cervix.

Subinvolution of Uterus and Abscess in the posterior wall.

Case 4.

Mrs. F. J——; admitted November 4, 1866; aged twenty-nine; American by birth; mother of one child, seven years of age. Since the birth of her child, she has been pregnant a number of times, but on each occasion procured an abortion about the end of the second month, this having been accomplished by the insertion of a piece of whalebone into the uterine cavity. On the last occasion, which occurred seven months previously, she lost a large amount of blood, and, at each menstrual period since, the discharge has been excessive, lasting for ten or twelve days.

She complained of severe pain during coitus; sitting down caused suffering, the sensation being that of something tender having been pushed up. Her bowels were costive, appetite poor, and digestion imperfect. The bladder was irritable, not tolerating more than one ounce of urine. She had had several chills within the week preceding her admission, followed by fever.

Examination.—Uterus large; os patulous and eroded; cervix hypertrophied, but soft. The finger, having been pressed into the posterior cul-de-sac, came in contact with a soft, fluctuating tumor, which appeared to be developed in the posterior wall of the uterus. Pressure gave extreme pain and caused nausea. The uterus measured five and three-quarter inches; its lining membrane was in a state of chronic inflammation.

An exploring-needle, having been introduced into the tumor, revealed the presence of pus. A free incision was then made, which gave exit to about three ounces of greenish-colored matter.

This treatment was followed by the hot douche, and after that the insertion of an opium suppository into the rectum every six hours. At the expiration of a week much less tenderness existed, and it was thought advisable to make an attempt to reduce the endometritis. A stick of solid nitrate of silver was passed into the uterine cavity and brought in contact with every part of its lining membrane.

For several days following the use of the silver there was an increase of pain, as also an increase in the quantity of the discharge. It was not, therefore, again employed, chromic acid having been substituted.

The hot-water irrigations of the uterus were continued for several weeks, and glycerine applied in the intervals between the injections. Iron, quinia, and strychnine were administered internally.

Recovery was slow; she had suffered several relapses. It was not until August, 1867, that she became sufficiently recovered to leave for her home in Massachusetts.

I heard from this patient in May, 1869. She was then six months advanced in pregnancy, and enjoying good health. I have had no communication from her since.

Subinvolution of the Uterus, with Secondary Syphilis.

Case 5.

Mrs. O. S——; admitted March 12, 1867; aged thirty; married; mother of three children, all of whom are dead. The youngest, if living, would have been fifteen months old. She was married four years before she became pregnant, and during that time enjoyed excellent health; but soon after she became *enceinte*, she noticed an eruption over her body, accompanied by persistent headache, and fever toward evening.

This she supposed was part of the inconveniences to which women in her condition were subjected, and paid but little attention to it, until her throat became so sore that she was compelled to seek advice. Under treatment the eruption disappeared, and her general health improved.

She repeatedly has had attacks of sore throat and ozæna, and latterly complains of pains in her bones at night, and constant supra-orbital pain, sleeplessness, and loss of appetite.

Her recovery from the birth of her first two children appears to have been moderately good, but from the last she has never recovered. Her appearance was that of a woman far advanced in consumption; her general expression haggard in the extreme, the countenance giving unmistakable

evidence of extreme suffering. Her lower limbs were covered with an eruption of rupia.

The uterus was large, measuring over five inches; os patulous, the forefinger passing in readily; the posterior lip partly covered by a suspicious ulcer; cervix swollen and tender.

There was little to be gained by local treatment beyond the application of soothing remedies, until an improvement was made in the general condition of the patient.

The following treatment was pursued:

℞ Tincturæ cinchonæ co., ℥ iv.
Hydrarg. bichlorid., gr. j.
Potass. iodidi, ʒ ij.
M.

One dessert-spoonful of this mixture to be taken three times daily, and the patient placed upon generous diet; glycerine and opium to be applied to the uterus every morning, and the hot-water douche used at night.

The alterative course of treatment was pursued with much benefit for six weeks, when it was discontinued, and the ammonia-tartrate of iron substituted, it being given in ten-grain doses. The iron appeared to irritate the bowels, and had to be abandoned, and the first prescription was again given, omitting the mercury. After the first two weeks her improvement was rapid, and at the expiration of three months she exhibited no symptoms of syphilitic disease. The ulcer on the posterior lip of the os uteri disappeared under the glycerine treatment; the uterus diminished in size as the patient increased in strength.

Pure carbolic acid was applied five times to the uterine mucous membrane, its application on neither occasion giving pain.

She was dismissed so much improved that it was believed a few weeks' residence in the country would complete the cure.

Commentary.—It appears from a careful examination of this woman's case that she had never suffered from a primary sore. Her husband, who appeared honest in his statement, informed me that the attack of syphilis from which he had suffered was contracted three years before his marriage; that he had submitted to a regular course of treatment and been pronounced cured. Before his marriage he consulted the same physician who had treated him, and was assured that it was safe for him to marry. He had occasionally what he called rheumatic pains in his bones, for which he had taken the

iodide of potassium, and they had disappeared under that treatment. There was no other symptom about him which indicated previous taint.

Subinvolution of the Uterus.

CASE 6.

Mrs. C. O'H——; admitted February 17, 1867; aged twenty-two; American; married at sixteen years of age; has had two children, the younger of whom is four months old. Her health was bad during the whole time that she was pregnant with the last child. Immediately preceding delivery she was attacked with remittent fever, from which she has not fully recovered. She complains of pain in the loins, extending down the thighs, irritability of the bladder, and profuse leucorrhœa.

Examination.—Uterus enlarged, measuring over five inches; os patulous and eroded; the entire mucous membrane of cervix and body in a state of chronic inflammation. The uterine leucorrhœa was characteristic of the diseased condition.

Treatment.—Constitutional: iron, quinine, and strychnine. Local: the application of pure carbolic acid to the interior of the uterus every eight or ten days, and the insertion daily of a pledget of raw cotton saturated with pure glycerine. After each application of the carbolic acid a morphine suppository was introduced into the rectum. Patient dismissed June 4th, cured.

There have been one hundred and seven cases of subinvolution of the uterus treated in the Institution. The general plan of treatment pursued has been similar to that adopted in the preceding cases, viz, perfect rest, generous diet, accompanied with stimulants, or not, as indicated. Locally, soothing applications to the uterus until pain should be relieved, and the use of carbolic or chromic acid to the inflamed membrane. Where enlargement of the organ remained from atony of the muscular fibre, after all the symptoms of inflammation had disappeared, a current of electricity was passed through the uterus daily.

In seven of the cases leeches were applied to the cervix on account of the existence of a higher grade of inflammation than is usually present in this form of disease. Their application gave marked relief.

The general results have been most satisfactory. Of the one hundred and seven cases treated, ninety-four were perfectly restored to health. Six left the hospital before the cure was completed, and were not afterward

heard from. Two died, during treatment, from Bright's disease of the kidneys, and one from valvular disease of the heart. Four, after being under treatment nearly six months, left without having been benefited, the uterus being harder, and the pains more severe than upon admission. Three of these patients have since been re-admitted, suffering from carcinoma uteri; the fourth went to Ireland and has not been heard from.

Such favorable results cannot be obtained in private practice, as patients are not so completely under control. Perfect rest can rarely be secured. The topical applications are less likely to be effectually or regularly made; and, what is a still more serious drawback, the complete abstinence from marital intercourse, so essential to recovery, cannot be enforced.

Carcinoma Uteri.

The fearful malignancy of this affection, its increasing frequency in this country, its certainly fatal termination when once fully established, in spite of the best selected remedies and the most accomplished medical and surgical attention, the pain which accompanies it, exceeding in intensity all that can be imagined as most horrible, attended by circumstances which render its unfortunate victim loathsome to herself and disgusting to those whom the ties of the strongest affection gather round her, combine to render the study of its pathology and causes one of unusual interest.

The thoughtful practitioner, when confronted with a disease so frequent and so utterly hopeless, in which he finds himself powerless, not only in arresting its fatal progress, but sometimes even in mitigating the horrible agonies to which it gives rise, necessarily asks himself: If I cannot cure this disease, can I not prevent it?

The importance of the subject will justify me in going somewhat into detail, with the hope that I may succeed in directing the attention of my professional brethren to this question: Is carcinoma uteri preventable?

The conclusion to which I have arrived as the result of a moderately large experience is, that, in the large majority of cases, the surgeon can, by judicious treatment, remove the exciting cause of the disease, and thus prevent an attack when the uterus is the organ threatened. It is true, it must sometimes be heroic, but not always necessarily so.

I am aware that I run the risk of being considered rash in making such a statement, but I am confident that facts will bear me out, and that by a careful

study of the pathology of carcinoma, with an analysis of the previous condition of patients who suffer from the disease, the conclusion will be reached, that cancer rarely, if ever, attacks the uterus *uninvited;* and when all circumstances are considered, the surprise will be that so many women escape its ravages, rather than at the number who fall its victims.

It attacks at the invitation of oft-repeated irritations, congestions, and inflammations, superinduced too often by willful violation of the plainest physiological laws. It comes not in consequence of a pre-existing hereditary taint transmitted from mother to daughter. It is not primarily a constitutional disease, and in by far the larger number of cases it does not destroy life by a general blood-poisoning, but by the exhaustion attendant upon the discharges and continuous pain to which the patient is subjected.

Of the true pathology of cancer but little was known prior to 1865. With its symptoms the ancients were well acquainted, and from the minute description of its ravages given by some of them it is evident that they were in the habit of making post-mortem examinations of its victims.

That we may compare our present treatment of the disease with that employed by Celsus, Scribonius, Largus, Aëtius, Archigenes, Leonidas, and others, it may not be out of place to make the following quotations from Paulus Ægineta, who has collected and condensed pretty much all that was known or had been written on the subject up to his time:

"Of cancers in the womb, some are attended with ulceration, and some are without it. In those cases in which the part is not ulcerated, a tumor is found about the mouth of the womb, hard, unequal, callous, of a feculent color, and red, but sometimes also somewhat livid; and they have violent pains in the groins and abdomen, the lower part of the belly and the loins, which are exasperated by handling and complicated applications. When the cancer is ulcerated, in addition to the pains, hardness, and swelling, there are phagedenic and unequal ulcers to be seen, which, for the most part, are foul, callous, white, and having ugly scabs on them; but some appear clean, some feculent, or livid, or red, or bloody. The discharge from them is always a thin ichor, watery, black or tawny, and fetid; but blood also is sometimes discharged along with the other symptoms of an inflamed uterus already mentioned. Wherefore the complaint is incurable, as Hippocrates has pronounced, but may be alleviated by hip-baths from fenugreek and mallows, and by cataplasms of a like nature. And the exacerbations of the complaint may be much alleviated by common mallows or marsh-mallows,

softened by boiling in honeyed water, and pounded with a little rose-oil, and applied; and by a cataplasm of dried figs and melilots, rue, frankincense and navew bruised carefully with oil, and also by that from dates boiled in must, containing also the yelk of eggs and fine flour; or that from poppies with coriander, knot-grass, or endive. These things are to be applied during the violence of the pains, after which a cerate may be applied from rose-oil, or myrtle-oil, or the oil from the flowers of wild vines, or that of apples with dates boiled in must. But one particularly recommended is that from the sediment found in copper-vessels, which, being burned, is reduced to a powder, and mixed with the cerate of roses until it acquires the consistence of a plaster. These are the external applications. But oil applied internally is soothing to the parts, and when they become ulcerated the milk of a woman may be injected, and the tepid juice of plantain. But if they bleed, the infusion of knot-grass with a little rosemary proves soothing, and so also do pessaries, medicated with saffron, woman's milk, and the juice of poppies, and the sordes of unwashed wool. But the following is one of the best applications: Of washed Italian litharge, oz. vj; of male frankincense, of the sordes of unwashed wool, of fresh axunge, of newly-made butter, of Tuscan wax, of each oz. ij; of rose-oil, oz. iv. Triturate the litharge with the juice of endive, and add to the other things when melted. Food of easy distribution, and wholesome, may be given, and some watery wine, avoiding acrid food and repletion, for they are apt to be troubled with indigestion.

"The uterus becomes scirrhous, sometimes all at once, without any preceding complaint, *but most frequently after having been preceded by inflammation, which has neither been resolved nor converted into an abscess.* The disease called scleroma is a species of scirrhus, most frequently forming about the neck of the womb, and having also some swelling, but less resisting, and attended with moderate pain. These are accompanied with displacement to the opposite parts, swelling powerfully resisting in proportion to the pain, with heaviness and difficulty of motion, not of the limbs only, but of the whole body, and aversion to exertion. When not properly cured a dropsical cachexia supervenes. In the commencement we must have recourse to venesection, or purging with the hiera of Archigenes; then to cataplasms of dried figs, grease of wool, nitre, wormwood, and cupping with scarifications; and to the soothing ointments, viz, the polyarchium, that from seeds, and that from bay-berries; to hip-baths prepared with the decoction of dried figs, mugwort, pennyroyal, and marsh-mallows; to pessaries

of turpentine, galbanum, myrrh, iris, and the grease of wool; to dropaces and the use of the natural baths, viz, the nitrous and bituminous. When the strength permits, a course of hellebore may be tried. * * * *

"Cancer occurs in every part of the body, for it takes place in the eyes and uterus, and most other parts, but is more particularly frequent in the breasts of women, because, owing to their laxity, they readily admit the thick humours which occasion it; for cancers are formed by black bile overheated, and, if particularly acrid, it is attended with ulceration. On this account they are darker than phlegmons, without being attended with the same degree of heat. The veins are filled and stretched around like the feet of the animal called cancer, (crab,) and hence the disease has got its appellation. But some say that it is so called because it adheres to any part which it seizes upon in an obstinate manner like the crab. Owing to the thickness of the humour which occasions it, cancer is an incurable disease, for it can neither be repelled nor discussed—not yielding to purging of the whole body, resisting the milder applications, and being exasperated by the stronger ones.

"It may be possible, however, to prevent incipient cancer from increasing, by evacuating the melancholic humour before it becomes fixed in the part. We may evacuate first, if nothing prohibit, by venesection, and afterward by purging at the commencement with the simpler purgatives, such as giving dodder of thyme to the amount of oz. iv, in whey or honeyed water, and afterward hiera, containing black hellebore. The juice of strychnos may be applied to the ulcerated parts without exciting pain, a linen rag being folded and wetted in it and laid on; but externally to this we must apply soft wool, which also has been soaked in the juice, and care must be taken that they do not become dry, by frequently pouring on some of the juice.

"In all carcinomatous ulcers of a chronic nature, one may use the preparation from pompholyx; and those remedies which were mentioned in the Third Book for Cancers in the Womb may be applied with advantage."

Archigenes, for carcinomatous and malignant ulcers, recommends the levigation of equal parts of burnt river-crabs and calamine, and to sprinkle or apply the ashes of crabs with cerate, or to apply the seed of hedge-mustard triturated with honey.

Hippocrates gives a long account of cancer of the womb, which, when fairly formed, he pronounces to be utterly incurable. He directs us, how-

ever, to try the effect of fumigating the womb by introducing into it a pipe attached to a pot. Steams from garlic and the fat of seals are to be applied in this manner.

Aretæus describes the ulcerated cancer, and that kind in which there is no ulceration. He calls them chronic and fatal diseases.

Haly Abbas pronounces the disease to be incurable, but directs us to soothe the sufferings of the patient by various anodyne preparations. For this purpose he gives direction for the formation of several suppositories and injections, the principal ingredients of which are linseed, chamomile, fenugreek, coriander, beets, poppies, and the like.

Alsaharavius indorses and approves of anodyne applications.

Rhases enjoins abstinence from everything of an acrid nature, and such articles as engender black bile.

Celsus describes carcinoma as an immovable and unequal tumor, attended with swelling of the veins, which are pale or livid. His account of the treatment is so important that it deserves to be given in his own words: "Quidam usi sunt medicamentis adurentibus; quidam ferro adusserunt; quidam scalpello exciderunt: neque ulla unquam medicina profuit; sed adusta, protinus concitata sunt, et increverunt donec occiderent; excisa, etiam post inductam cicatricem, tamen reverterunt, et causam mortis attulerunt: cum interim plerique nullam vim adhibendo, qua tollere id malum tentent, sed imponendo tantum lenia medicamenta quae quasi blandiantur, quo minus ad ultimam senectutem perveniant, non prohibeantur." In another place, however, he recommends compositions containing arsenic, copperas, cantharides, galls, etc. He makes a distinction between the cacoethes, or malignant tumor, and the true carcinoma, but says that the difference between them is to be recognized only "tempore et experimento." He marks the gradations of malignant disease with singular precision: first, there is cacoethes; then, carcinoma without ulceration; and, last, there is the fungated ulcer. In doubtful cases he directs us, first, to apply caustics or heating medicines; and, if the disease is alleviated, to proceed to the scalpel or burning, according to circumstances; but if it is exacerbated, we are to conclude that it is of a carcinomatous nature, and must abstain from all acrid and vehement applications.

Scribonius Largus recommends for all malignant ulcers, even such as are cancerous, an application consisting of arsenic, p. vj; of squama aeris, p. iij; of elaterium, p. j; of burnt paper, p. iij.

Aëtius gives from Archigenes and Leonidas an interesting account of the disease, which he divides into ulcerated cancer and cancer without ulceration. He describes the disease in the female breast as consisting of a large tumor, which is unequal and resisting, extending its roots far, and being attended with varicose veins; its color is either cineritious, verging to redness or livid; it appears soft, but is in reality very hard; is accompanied with a pungent pain, and gives rise to malignant phlegmons in the armpits. The pains shoot to the clavicle and scapula. An ulcerated cancer, he says, goes on corroding and spreading deeper, nor can it be stopped; it discharges a sanies of an abominable smell, and is aggravated by medicines and handling.

The disease he considers as generally incurable. He recommends purging with hiera and the theric, Mithridatic antidote, etc. Apparently, in order to mitigate the violence of the pains, he directs us to make an application containing equal portions of plantain, poppy-heads, the seed of the wort, and other things of the like kind. For ulcerated cancer he recommends emollient epithemes, such as the one containing litharge, axunge, white wax, oil, and the yelks of eggs.

Oribasius and *Actuarius* supply nothing of importance that is not to be found in Paul of Ægina.

Nonnus, according to Sprengel, is the only ancient author who attributes cancerous ulcerations to acrimony of the bile. But Nonnus merely copies the words of Paul of Ægina.

The Arabians agree with the Greeks in representing the disease as being produced by black bile. They were, no doubt, led to form this opinion from remarking that the blood in the part is thick and black, which they considered owing to its not being properly purged of its recrementitious sediment. The moderns deride this theory, but they have substituted nothing satisfactory in its stead. Van Swieten thinks more favorably of the ancient doctrines. Avicenna speaks highly of a milk diet. Serapion likewise approves of milk deprived of its butter, and of a vegetable diet. He speaks of no other treatment as being likely to prove remediable, with the exception of excision and the cautery. Haly Abbas rather approves of excision when the disease is seated in a part which admits of this operation. However, like Galen, he disapproves of tying the arteries. The characteristic symptoms of the disease, he says, are a stony hardness and distension. The account given by Alsaharavius is nothing different. Rhases has little

confidence in excision. After ulceration has taken place he approves of using a cooling application, containing ceruse, tutty, rose-oil, the juice of nightshade, and some other such things of a cold nature. He mentions a case of cancer of the breast, in which the whole mamma was extirpated, but the disease returned on the other side. One of his authorities, Antyllus, describes the cancerous sore as having a tendency to spread inward, its edges being thick, large, and everted, and the discharge thin and acrid. When the disease cannot be completely extirpated, he forbids us to meddle with it. Theodoricus and all the earlier modern writers on medicine call cancer by the name of apostema melancholicum, and recommend the same treatment for it as the Greeks and Arabians.

It will be seen by the foregoing extracts from the old writers on cancer that they were almost as familiar with its symptoms and the indications for its treatment as we are to-day. They employed such means as they possessed to allay pain during its exacerbations and destroy the fetor of the discharges. In what appeared to them suitable cases, they did not hesitate to use the knife, actual cautery, or caustics for the removal of the disease. The general result of the treatment pursued eighteen hundred years ago was the same as now, and the reason no advance has been made has been on account of the absence of knowledge of its pathology.

With the modern aids of science we have, however, made vast strides in this direction, and if we can not cure the disease, we may reasonably hope to learn sufficient of its causes to be enabled to prevent its attack.

The investigations of Virchow, Billroth, Rindfleisch, Koester, and Thiersch have shed so much light upon this subject that the pathological anatomy of cancer is beginning to be understood as well as that of pneumonia, and the mystery which has hitherto surrounded this fearful malady is being dispelled. We find that its growth is governed by the same laws which regulate every other growth in the body; and instead of searching in the blood for some subtle poison giving rise to the local manifestation of the disease, we must look for its origin in some local irritation by which the nutrition of the part is perverted.

The following extract from Rokitansky's Pathological Anatomy, while of little value in so far as the pathology of the disease is concerned, contains so admirable a description of the destruction produced in the contiguous tissues, and in some points agrees so fully with what I have been in the

habit of teaching concerning its origin, etc., that I have thought well to introduce it:

"*Carcinoma.*—Next in frequency to fibroid growths is the occurrence of cancer. It always attacks the cervix in the first instance, and especially that portion which projects into the vagina; the primary occurrence of carcinoma at the fundus uteri is so extremely rare that the above observation may be considered as an absolute rule. It is contrasted in this respect with fibroid and tubercular disease of the uterus, and it presents a similar contrast in reference to its extension and ulcerative destruction.

"According to our observations, fibrous cancer very rarely affects the uterus; the most common form is the medullary, either by itself or complicated with the former.

"Opportunities very rarely present themselves of investigating the early stages of cancer in the dead subject; according to a few observations, fibrous carcinoma, when closely examined, appears to consist of dense whitish, retiform fibres, differing from the normal texture of the vaginal portion of the uterus in which they are found, and in their very minute meshes a pale reddish-yellow or grayish translucent substance is deposited.

"This morbid growth is inserted into the uterine tissue without well-marked boundaries; it occupies a various extent, and from accumulating at certain points, gives rise to the irregular nodulated character and the well-known induration which accompanies the enlargement of the cervix.

"Medullary cancer in the first instance appears as an infiltration of a white lardaceo-cartilaginous or lax encephaloid matter, in which the uterine fibre disappears; as the deposit increases, the vaginal portion assumes an uneven nodulated character and appears hard and elastic to the touch. Cancer of the uterus very rarely presents itself in the shape of isolated globular growths.

"As the cancerous degeneration proceeds, and especially on the commencement of the stage of metamorphosis, with its consequent new formations, particularly if they belong to the medullary variety, the lower segment of the uterus undergoes a very considerable and rapid enlargement. At last we find a callous, loose, spongy ulcer developed in the usual manner, which discharges a very fetid, greenish-brown, sanious and sanguineous fluid, and as it extends generally causes a progressive infiltration of cancerous matter. The tumefaction of the cervix and the fungoid excrescences

not unfrequently close up the orifice, and the consequent enlargement of the womb will be the larger the more copious the secretion of the mucus.

"Cancerous degeneration of the uterus is generally confined, in a very remarkable and distinct manner, to the vaginal portion; still there are frequent exceptions to this rule, as the disorganization is sometimes found to extend with great rapidity to the body, and even to the fundus of the uterus; this is particularly the case if the os tincæ has already been attacked by ulceration.

"The disease may spread downwards and involve the vagina, thus establishing vaginal cancer. It may extend in other directions, and thus give rise to cancerous degeneration of the rectum, the bladder, the pelvic, cellular, and adipose tissues, and the periosteum; the uterus thus becomes fixed in the pelvis, and at last we find the peritoneum attacked, cancerous growths being formed upon it and its tissue, or perforating it, especially in the shape of medullary masses.

"Cancerous ulceration spreads in the same direction; in rare cases we find the greater part of the uterus, and even its fundus, destroyed. The destructive process, when attacking the vagina, sometimes predominates on the anterior, sometimes on the posterior surface; sometimes it attacks both equally, and may extend downwards almost to the external orifice. It also involves the degenerated parietes of the rectum and of the bladder, and generally produces extensive communications between their cavities and the original cancerous sinus, (ulcerous cloacæ.) It finally extends, in the shape of sinuous passages, through the remainder of the cancerous mass that fills the pelvic cavity, to the pelvic bones.

"In this manner a large cavity with fungoid parietes is at last established, which occupies the greater part of the uterus and the vagina, and opens into the cavities of the rectum and the bladder; above it is closed in by the fundus uteri and the adherent rectum and the cervix vaginæ, as also by the cæcum and small intestine, which are agglutinated to these parts, and at last it penetrates into the cavity of the peritoneum or the intestines. The contents of the cavity are cancerous ichor, mixed up with fæcal matter, urine, and portions of gangrenous tissue.

"The temporary and tumultuous periods of development presented by the peritoneal inflammations of the pelvic and hypogastric regions, which accompany and characterize the metamorphic and ulcerative stages, and

which not unfrequently extend from the original layer over the entire peritoneum, and are important occurrences in the progress of cancerous disease.

"*Uterine cancer is, in most cases, a primary disease, and generally remains for a long time, if not throughout, the sole carcinomatous affection of the organism.* However, it is sometimes developed concurrently with or consecutively to mammary and ovarian cancer; or it is accompanied by degenerations of the adjoining tissues above mentioned, and of the lymphatic glands, which must be explained upon the theory of propagation by contact; or again, it is associated with cancer of the peritoneum of the liver, the stomach, and the breasts, with cancer of the bones, with mollities ossium, ovarian cancer, and universal cancerous deposit, as a consequence of the resulting cancerous dyscrasia.

"Uterine cancer most frequently occurs between the fortieth and fiftieth year; still there are many cases on record in which it appeared between the thirtieth and fortieth years, and even earlier. The cases of spontaneous recovery from uterine cancer are of extreme rarity, but they do occur; the carcinoma and the cancerous ulceration are then limited to the cervix, the internal orifice forming the boundary; the loss of substance heals with a funnel-shaped cicatrix." (Rokitansky.)

Rindfleisch remarks:

"By carcinoma we understand a new formation destroying the organs of the body, after extirpation, commonly recurring and undergoing metastasis, therefore malignant. These properties certainly pertain, also, to certain histioid tumors; and it were exceedingly desirable if there were a positive anatomical characteristic by which we could recognize carcinoma as such, and could distinguish it from other destructive and malignant new formations. We have now become accustomed, and to-day we yet hold fast this custom, of regarding a certain peculiarity of structure, the so-called alveolar structure, as a necessary requisite for the diagnosis—cancer. By this we wish to say that we seek for the substance of the carcinomatous degeneration in a deposition in foci of cells advancing in fixed directions, which necessarily tends to this that we must grant to the parenchyma of the organ in process of destruction which remains between these cellular depots the form of a framework, a trabecular, or net work, (stroma,) whose meshes (alveoli) are determined by the form and size of the deposited aggregations of cells.

"It is manifest that this structure is particularly fitted to lodge large amounts of free cells, which we must regard as the most effective stimulus as well for the local growth of a tumor as for the infection of the entire organism. The seeming arbitrariness with which we proclaim the alveolar structure as the anatomical criterion of cancer consequently receives its justification." * * * * * * * * * *

"The greater number by far of carcinomas proceed primarily either from the epithelial-clad surfaces of the body, from the skin and mucous membranes, or from the secerning glands. They depend upon an abnormal growth of the epithelial tissue. We may say that an ingrowing of epithelium into the sub-epithelial layer of connective tissue of membranes or into the interstitial connective tissue of glands forms the fundamental process in these carcinomas.

"The nature and manner of the ingrowing are extraordinarily various. The whole impression made by a carcinomatous destruction—for example, the observation of a vertical section by a low magnifying-power—appears to justify the opinion that in them the question is about a diseased imitation of those histological processes which precede the development of glands with excretory ducts; namely, here, as there, we see aggregations of epithelial cells, which proceed from the under surface of the epithelium in the form of cones or strands, and insinuate themselves between the separating filaments of the connective tissue. Active processes of division also show themselves in the elements constituting the cell-aggregations, so that in both of these principal points an undeniable uniformity with glandular growth is present.

"Nevertheless, the view that the carcinoma formation consists in a subordinate and irregular imitation of the physiological glandular growth (hétérodénie of the French) has but a very contracted justification.

"For the carcinomas of glands with open outlets, of course, we may even indicate with emphasis that all imaginable transitions between glandular hypertrophy and the glandular carcinoma are to be found. We of the latest time have learned to know these intermediate forms more fundamentally, and have invented the name adenoma, to designate a tumor which is neither simple hypertrophy nor carcinoma. This is at least the most comprehensive conception. Several authors certainly move the idea of adenoma up and down upon the scale mentioned, in that they now assign

it more to hypertrophy, now more to carcinoma; that, however, a motion up and down of this kind is possible just proves the existence of the scale.

"The general comprehension, however, of carcinomas, which proceed from the epidermis or the epithelium of mucous membranes, is much more difficult; namely, here also exists an unmistakable correlation of the hyperplastic and carcinomatous conditions. It is, for example, a well-known experience that those circumscribed hypertrophies of the skin which we term warts and papillomas have the capacity of going over into epithelial carcinoma. This transition is brought about purely anatomically in the following manner: The papillar hypertrophy conditions a more or less great alteration of the level of that plane in which the epithelium and connective tissue come into contact. The steeply-raised lateral surfaces of the enlarged or newly-produced papillæ bound deep, cleft-like depressions between the papillæ.

"The epithelial covering of the papillæ is, at the same time, an epithelial lining of the interpapillary clefts, and as long as this relation remains constant by a sufficient desquamation of the older epithelial cells, the hyperplastic character of the tumor is preserved.

"It is, however, manifest that a sufficing desquamation is so much the less possible, the more the papillæ elongate, and especially the richer their dendritic ramification proves to be. The lateral pressure which the points of the papillæ, widely branched but united to a narrow basis, exert, simultaneously closes from above the interpapillary clefts, and causes in them a gradually increasing accumulation of epithelial cells. The epithelium in the deeper parts of the tumor no longer appears as a lining, but as a solid plugging of the interpapillary clefts. As such it now begins to push forward against various points of the connective-tissue substratum. Oval epithelial cones appear, which first protrude from the under surface of the epidermis into the cutis, then penetrate deeper and deeper.

"By this the carcinomatous condition is given. We cannot of course avoid comparing these cones with the epithelial cones in the glandular formation; we also observe, as was said, lively processes of division in the constituent cells, although, until proof to the contrary has been shown, I am convinced that their growth chiefly depends upon a peripheric apposition of young cells, like the growth of normal epithelium, and find this representation just as plausible as perhaps the enlargement of retention-cysts by the

secretion from their walls. The processes of division in the interior of the epithelial cones indicate a secondary growth, and may indeed contribute the greater part to the thickening of the epithelial cones; to their elongation, however, and their forward progress upon which the peculiar destruction of organs still depends, they do not contribute. I content myself, in these preliminary remarks, to have pointed out that the laws of normal growth are correctly maintained even in these extreme and most dangerous excesses."

Billroth says:

"The common clinical definition of carcinoma should be controlled by the anatomical structure of these tumors. In accordance with this, I only call those tumors true carcinomata which have a formation similar to that of true epithelial glands, (not the lymphatic glands,) and whose cells are mostly actual derivatives from true epithelium. I am convinced that this view will constantly have more adherents, and that thus the differences about the anatomical definition of 'carcinoma' will constantly diminish. Those investigators who, during the last few years, with all the modern aids, have worked without prejudice on this portion of the study of tumors, recognize the great importance of epithelial proliferation in those tumors that we call cancer; still most of them seek for a compromise between the different histogenetic views, and wish still to admit, in a modified form, the development of true glandular and epithelial cells from connective tissue, (heterology proper, Rindfleisch, Volkmann, Klebs, Lücke;) only Thiersch and, recently, Waldeyer maintain, as I do, the strict boundary between epithelial and connective-tissue cells. Waldeyer defines carcinoma as an atypical epithelial neoplasm. But we must here state that in cancer-tumors, besides the epitheliums, there are usually numerous young small round cells which, infiltrated in the connective-tissue portion of the tumors, form an important part of it. This small-celled connective-tissue infiltration, which exists in varying quantities wherever epithelial proliferations grow into the tissue, appears to be caused by a sort of reaction, and to be the result of the penetration of the epithelial new formations into the tissue according to the number of infiltrated cells and their future fate, as well as the degree of vascularity, just as in inflammation it sometimes leads to softening, to atrophy, and cicatricial thickening of the tissue. In some cases this small-celled infiltration is so considerable as almost entirely to hide the epithelial new

formation, from which it may be very difficult to distinguish if the latter be small. We may then be in doubt if it should not be regarded as entirely independent, and occasionally, perhaps, as the sole constituent of cancerous tumors. Formerly I myself thought it necessary to agree to this, and even supposed that this component of carcinoma possessed a spontaneous power of infection; *but further observations with new aids have made it appear to me more probable that, even in the smallest cancerous nodules, epithelial elements always gave the first start for development. This has been confirmed by Waldeyer.*"

Frey remarks:

"The carcinomata, or cancerous tumors, those enigmatical and most dangerous new formations of the body, are imbedded, at least in the normal connective-tissue textures, and show, in conformity therewith, a frame-work consisting of a connective-tissue intercellular substance. In the sometimes larger, sometimes smaller spaces of this frame-work lie imbedded cells which may, in certain cases, resemble those of pavement epithelium, but generally, however, they present a character which does not thoroughly correspond to that of any of the normal cells, although they may have taken their origin from glandular or epithelial cells. These 'cancer-cells' are capable of an unlimited, exuberant multiplication. It is customary to distinguish between certain forms of carcinoma. A tumor is generally called scirrhous (Faserkrebs) when there are only small collections of cells imbedded in a firmly interwoven connective-tissue frame-work, so that the tumor possesses throughout the character of hardness and firmness. Inversely, one speaks of medullary carcinoma where large aggregations of cells occur in spaces of considerable size, the whole having a softer consistence, and the groups of cells forming masses of a butter-and-cream-like nature. If the cells have the appearance (but not the group-like arrangement) of pavement epithelial cells, we have one form of epithelial cancer, while the others have cylindrical cells, in both cases certainly descendants from the epithelial and glandular cells. If the substance of the frame-work presents a strongly-marked fungous (alveolar) structure, and in the numerous spaces lie cells which are undergoing the colloid transformation, we have the alveolar or colloid cancer of the pathological anatomists. It is well known that sharp boundaries between these various forms of carcinoma do not exist; that they frequently pass into each other; and that in one and the same tumor some localities may be more of one character, and others more of another.

Doctor J. J. Woodward, the accomplished microscopist of the United States Army Medical Museum, has recently published a monograph on cancer, in which he describes and furnishes illustrations of two cases of carcinoma; one multiple cancer consecutive to the ablation of a primary carcinoma of the female breast, and the other primary mammary tumor of similar structure.

The succinct and masterly manner in which he has handled the pathology of malignant growths, and by which he embraces, within a brief compass, the most modern views upon the subject, saves the profession the labor of exploring lengthy essays, some of which are difficult to comprehend.

I consider this last production of Doctor Woodward so valuable that I have copied the greater part of it.

"Koester has been led to the opinion that carcinomatous growths very frequently have their origin in a proliferation of the endothelium of the lympathics of the parts involved, and that this transformation plays probably a great part in the development of most cancers and sarcomas. His work, so far as published, is confined to the examination of epithelial cancer of the skin and alveolar colloid of the stomach, (alveolarer Gallertkrebs des Magens,) and he has postponed for future parts the detailed examination of other varieties. His views have been received with much favor in various quarters; I may especially mention Rindfleisch as having given prominence to them in the last edition of his text-book. I shall have occasion to refer further to the views of Koester in the sequel. * * *

"No. 955, Medical Section: The left mammary gland, which is transformed into an oval, flat, somewhat nodulated scirrhous tumor, three and a half inches long by two and a half broad, and about an inch thick in the center.

"In thin sections of this tumor, individual lacteal alveoli and ducts, stuffed with large cells derived evidently from the glandular epithelium, were but sparsely scattered, and the greater portion of the gland was replaced by a peculiar scirrhous tissue, in which its scanty atrophied remains were imbedded. This peculiar tissue consisted of a firm, delicately fibrillated connective-tissue stroma, containing numerous small cells and many fine elastic fibres, and of a plexus of irregular, varicose, nucleated cylinders of protoplasm, corresponding in many respects to the 'cell-cylinders' of Koester, which intimately interlaced with the connective-tissue stroma, filling all

its meshes except those occupied by the vessels and the atrophied remainder of the gland. These nucleated cylinders did not appear to be composed of separate cells. They seemed rather to consist of a granular protoplasm, in which innumerable nuclei, 1-2500th to 1-2000th of an inch in long diameter, or even larger, were imbedded side by side, without any evidence of limiting cell-walls separating the protoplasm surrounding each nucleus from that belonging to its neighbors. On scraping or teasing the sections, moreover, the nuclei escaped abundantly into the 'juice' in a quite naked condition. Very often, however, some of the nuclei appeared in the 'juice' thus obtained surrounded by a more or less irregular mass of protoplasm, resembling thus 'the typical cancer-cells' of the older writers.

"The nucleated cylinders usually varied from the 1-1000th to the 1-500th of an inch in diameter, but in some parts attained still greater dimensions. In places where the section passed transversely through the cylinders, they appeared as round or somewhat oval masses of protoplasm, stuffed with nuclei, which might readily pass for the 'mother-cells' of the books. In glycerine and balsam preparations, the protoplasm of the cylinders was often shrunk away from the connective-tissue stroma, the margin of which, being clear and transparent, might almost be taken for a limiting membrane. The nuclei of the cylinders were transparent or but slightly granular when fresh, and usually contained a single large nucleolus. In the balsam-mounted sections they appeared more decidedly granular. Elongated nuclei with two nucleoli and other indications of commencing division were but rarely observed. The nuclei of the connective-tissue stroma were generally rather longer than those of the cylinders, but much narrower. Occasionally their position was occupied by little rows of two, four, or more nuclei, which might be supposed to be the progeny of the connective-tissue nuclei. Such rows were generally surrounded by a small quantity of protoplasm. Sections taken from the peripheral portions of the tumor generally presented a certain amount of more or less altered adipose tissue. The quantity of the matrix between the fat-cells was much increased, so that instead of the individual cells of each fat-lobule being apparently in contact, they were separated to a greater or less extent (often the 1-2000th of an inch or more) by a delicately fibrillated matrix, in which were imbedded many oval nuclei, which were both larger and more numerous than normal. The connective-tissue septæ between the individual fat-lobules were also greatly thickened, and

in many places contained cell-cylinders quite like those of the body of the growth. (See Microscopical Section, Nos. 4615—4631.)

"No. 958, Medical Section: A portion of the right lobe of the liver. The liver was nearly normal in size, but presented in section numerous little hard whitish nodules, varying from the size of a pin-head to that of a pea, or even smaller. These were invariably situated in the course of the portal vessels, *i. e.*, in the interlobular spaces. In structure they closely approximated the scirrhous tissue of the breast-tumor as above described; simply the meshes of the plexus of nucleated cylinders were less elongated, and in the sections, therefore, these more frequently appeared as round or oval forms, (the cylinders having been cut more or less obliquely,) and less frequently as continuous cylinders of some length, such as were common in the breast-sections. Hence, on superficial observation, the sections of these cancer-nodules of the liver appeared at first sight as a nucleated connective-tissue stroma, in which numerous large, round, oval, or elliptical mother-cells, containing numerous nuclei, were imbedded. On carefully focussing, however, it was easy to perceive that these apparently separate masses of protoplasm formed, in fact, portions of a complete net-work of nucleated cylinders, which had been divided by the section. As in the case of the mammary tumor, the cylinders appeared to consist of a mass of granular protoplasm, with numerous nuclei imbedded, actual cell-walls being nowhere distinguishable.

"Nowhere did it appear that the hepatic cells had contributed by their multiplications to the formation of the cancer-nodules; on the contrary, the actual structure seemed quite clearly to contradict any such inference. For some little distance around each little cancer-nodule the cut ends of single nucleated cylinders were frequently observed imbedded in the very substances of the hepatic acini. They always occupied, however, the vascular spaces or the meshes of the network of hepatic cells, and these appeared quite normal, except in the immediate vicinity of the cancer-nodules, where the chains of hepatic cells were often flattened somewhat, as though by the pressure of the growth. At the margins of the growths, in many places, nearly all the meshes formed by the compressed hepatic cell-chains were occupied by the nucleated cell-cylinders of the cancer, the atrophied secreting tissue of the liver here taking a position corresponding to that of the connective-tissue stroma of the more central portion of the cancer-nodules.

The cancer-nodules then would appear to have grown by a continuous extension of their nucleated cylinders into the adjacent hepatic parenchyma, the secreting cells of which seem to perish by atrophy without contributing to the substance of the growth. (See Microscopical Section, Nos. 2389–2393.)

"No. 960, Medical Section: The uterus and its appendages. Each ovary is transformed into an oval somewhat nodulated scirrhous mass, an inch and three-quarters in long diameter. In sections no trace of Graafian follicles or ovules could be discerned. The scirrhous mass everywhere consisted of a tissue very similar to that above described in the breast. Simply the meshes of the nucleated cylinders were longer, so that when the section passed parallel to them they could sometimes be traced running parallel to each other for some distance; moreover, the connective-tissue stroma was more conspicuously fibrillated than in any of the other growths. (See Microscopical Section, Nos. 2449–2467.)

"No. 956, Medical Section: The heart.

"No. 957, Medical Section: A portion of the pericardium. On the surface of the heart and of the parietal pericardium were a number of flat, white thickenings, which were at first supposed to be carcinomatous. They proved on section to be composed of an imperfectly fibrillated matrix, in which numerous small corpuscles were imbedded, and probably are to be referred to some previous inflammatory process, and not to the carcinomatous disease. (See Microscopical Section, Nos. 4690–4693.)

"On reviewing this case we cannot fail to be struck first with the great similarity of the minute structure of all the morbid growths, although seated in quite diverse organs. Everywhere the normal tissue characteristic of the part affected appeared to be replaced by the morbid product, which was everywhere similar in texture.

"This similarity of texture has long since been frequently observed in multiple carcinomatous growths, and is the anatomical basis of the doctrine of a cancerous dyscrasis regarded as the constitutional cause of the local affections. It will readily be understood that if we could believe in a special modification of the blood giving rise to peculiar organizable exudations we should expect the tissues thence derived to be everywhere characterized by some common structural features, the consequence of their common origin. Such a view as that of Koester, however, would equally well explain the

circumstance referred to; for, if the nucleated cylinders are everywhere transformed lymphatics, they must be expected to have very many features in common, combined with some minor differences in the caliber of the cylinders—the size of their meshes, etc.—consequent upon the local variations in the character of the finer lymphatic nets.

"Koester describes the net-work of cylinders in epithelial cancer as 'cell-cylinders,' and was able, by silver imbibition, to map out cell-walls, and to trace the continuity of the cancer-cylinders, with normal lymphatics lined by their characteristic epithelium. At the time the foregoing case was investigated his monograph had not yet reached me; since reading it I have caused sections of several other carcinomatous tumors to be treated with silver, by Dr. E. M. Schaeffer, one of the assistants at the Museum. In several instances results were obtained approximating those described by Koester, but they have not yet been sufficiently complete to justify me in forming a definite opinion. I hope to make this matter the subject of a future report. In the mean time, however, I can not but admit the close correspondence between the outlines of the plexus of nucleated cylinders and the net-work obtained when the lymphatic capillaries are injected. And I may add that the general features of the morbid growths above described, viz, a net-work of nucleated cylinders interlacing with a connective-tissue stroma, are to be observed in quite a number of the sections of carcinomatous growths preserved in the Museum. In none of these cases, however, have I, as yet, been able to satisfy myself with Koester of the existence of a lumen in the central part of the nucleated cylinders, nor am I convinced that the normal lymphatic capillaries lined by an epithelium are alone capable of being transformed into the cancer-cylinders. Much more probable does it appear to me that all the lymphatic spaces of the connective tissue are susceptible of this transformation, which would at once account for the voluminous character of the pathological net-work. The presence or absence of cell-walls in the protoplasm through which the nuclei of the cancer-cylinders are distributed does not appear to me an essential point. Marked cell-walls can be observed in the cylinders of several epithelial cancers in the Museum collection. On the other hand, Koester himself mentions that at times he found cylinders in which the nuclei were imbedded in a granular protoplasm, in which no cell-walls could be observed.

"In the present state of our knowledge we may perhaps regard the cell-

wall as an indication of a comparatively advanced stage in the history of the individual cell, which at first consists of a nucleus surrounded by a mass of protoplasm. There seems, then, no difficulty in agreeing with Koester to regard such nucleated cylinders as I have described above as composed of cells too young to be possessed of walls, and placed in such close juxtaposition that no line of demarkation can be observed between the protoplasm of the several elements.

"As to the mode in which the cells of these cancer-cylinders arise, however, I find greater difficulties. I am not satisfied, either by my own examinations or by the study of Koester's paper, that they can be justly considered the progeny of the lymphatic endothelium. A view which should regard them as transformed white corpuscles accumulated in the lymphatic passages appears to me, if anything, a more probable interpretation. This would harmonize with the general absence of any demonstrable lumen, as well as of demonstrable cell-walls for the separate elements, at least in the earlier period of the history of individual cylinders; it would also harmonize with the close agreement generally observed between the elements of the youngest cylinders, *i. e.*, those in the most peripheral parts of the growth, and ordinary granulation-tissue.

"I am not willing, however, to commit myself very warmly at present to the advocacy of any detailed views as to the mode of origin of the cancer-cylinders. I desire simply to call attention to the probability, now almost a certainty, that they are conditioned in their genesis till further facts have been accumulated.

"In the case which has been described, the primary growth was not received by me for investigation. I have, therefore, added a short account of a primary tumor of the breast, in which the structure was very similar to that observed in the secondary cancer of the breast in the case above described.

"No. 5905, Surgical Section, is a scirrhous tumor of the female breast by a surgical operation in the spring of 1870. No particulars are recorded, and the subsequent history of the patient has not been reported. A section through the piece shows that the mammary gland is represented by a small, somewhat pyramidal mass, the apex of which terminates in the retracted nipple. The borders of the mass extend irregularly into the surrounding adipose tissue, which constitutes the bulk of the specimen. The case rep-

resents that very common variety of scirrhus in which the mammary gland is transformed into a small irregular cancerous mass, while the surrounding adipose tissue remains normal in bulk, or even may actually increase in quantity. Nos. 3489, 3490, and Nos. 4616–4623, Microscopical Series, are sections of this tumor.

"In these sections, as in the secondary mammary tumor in the former case, more or less modified gland-lobules were but rarely encountered, and the greater part of the carcinomatous tissue appeared to consist simply of a net-work of nucleated cylinders imbedded in a connective-tissue stroma. In this case, however, the cancerous mass was imbedded in a more bulky mass of adipose tissue, the peripheral parts of which were quite normal. The separate fat-cells were much larger than in the first case, being from 0.002 to 0.004 inch in diameter, while in the first case the limits were 0.001 to 0.002 inch. This would appear to depend simply upon the degree of emaciation, which existed in the first case at the time of death. At all events, the anatomy of that part of the adipose tissue which adjoined the morbid growth was essentially the same in both cases. Extension of the cancer-cylinders into the connective-tissue septæ between the fat-lobules and the development of a more or less abundant nucleated matrix between the individual fat-cells of those lobules nearest the scirrhous tissue were characteristic conditions in both cases.

"The first of the plates which illustrate this paper represents a portion of preparation, No. 3489, Microscopical Section, which is taken from this second case, magnified 400 diameters. It exhibits a side-view of a part of the net-work of nucleated cylinders. The granular character of the protoplasm, the imbedded nuclei, and the manner in which the nucleated cylinders interlace with the connective-tissue stroma are faithfully represented. The nuclei of the connective-tissue stroma are not so obvious, but few of them lying in the optical plane selected for representation.

"The second plate represents a portion of one of the liver-nodules in the first case. It is copied from preparation No. 2393, Microscopical Section, magnified 400 diameters. The section divides several of the nucleated cylinders in a direction nearly perpendicular to their course, and they appear hence, as above described, not unlike so many multi-nucleated or mother-cells.

"Both photographs were made from carmine-stained preparations,

mounted in balsam, and in both, therefore, the nucleated cylinders appear shrunk away from the connective-tissue stroma in which they are imbedded.

"In conclusion, I must refer briefly to another interpretation of the nature and origin of such nucleated or cell cylinders as I have above described, which has been received with great favor for some few years.

"Thiersch, in his work on Epithelial Cancer, explains the cell-cylinders in that form of carcinoma, especially of the skin, as outgrowths from the lower layer of the epidermis and from the epithelium of the glandular apparatus. Such an interpretation implies, of course, the possibility of demonstrating that the cell-cylinders are continuous with the epithelial structures from which they are supposed to have budded forth. Such a continuity Thiersch believes himself to have observed in many of his sections. He admits, however, that it is often impossible to make it out, and explains this by supposing the connection to have originally existed, but subsequently to have disappeared, pointing, in justification of the hypothesis, to the history of the normal development of the embryo as affording many examples of epithelial formations, which proceed originally from the epithelium of the surface, but become disconnected with it at a later period of their growth. Thiersch did not fail to observe the fact of the frequent anastomoses of the cell-cylinders, which he has very well figured in Fig. 1, Tab. IX, but this circumstance did not shake his confidence in the view he had propounded.

"Billroth maintains similar views to those of Thiersch, not merely for cancer of the skin, but also for mammary cancers, and, in fact, for cancer generally. In the last edition of his lectures he mentions the view of Koester as 'enticing,' but thinks that 'all his evidence in favor of this view is not tenable.'

"I would call attention, however, to the fact that the manner in which the cell-cylinders anastomose in at least many mammary cancers points rather to the lymphatics than to the mammary-gland tissue. Moreover, when a mammary cancer returns after extirpation, or when secondary growths develop in distant organs, as in the case reported in this paper, the new formations are generally constructed upon the same structural plan as the original growth. To reconcile these facts with Billroth's views, we must resort to far more complicated and improbable hypotheses than those of Koester.

"Billroth was well acquainted with the anastomosing cell-cylinders in

certain forms of mammary cancer. He describes such growths as the 'tubular form.' According to him, mammary cancer, in general, almost always begins 'with a coincident enlargement of the small, round, epithelial cells in the acini, and with small-celled infiltration of the connective tissue around them.' He admits that it is 'difficult to make out the further fate of the glandular acini,' yet he has no doubt that in the tubular form 'the acini do not maintain their form, but grow into the connective tissue as very thin cell-cylinders, while it becomes infiltrated with cells.' I mention with interest that Fig. 144, page 643, of his work, (*loc. cit.*,) agrees precisely, so far as a wood-cut can represent the microscopical appearances of a morbid growth, with portions of some of the sections of the two cancerous breasts described in this paper. In it, as in them, certain figures, which undoubtedly represent more or less modified gland acini and ducts, lie side by side with the cell-cylinders, which are variously shaped in accordance with their relation to the plane of the section. Both are imbedded in the same connective-tissue stroma, but in his figure, as in the Museum preparations, no anatomical connection between the two is shown. They are separated always by connective tissue. Nevertheless, I am not prepared to deny that transformations of the true gland-tissue of the parts involved play a certain role in producing the texture of cancerous growths. But just how far they are atrophied and perish, how far at times a formative activity may lead to their transformation, are matters as to which it is difficult at present to form a judgment, and to which I hope to return at some future time. Meanwhile I cannot avoid calling attention to two more of Billroth's wood-cuts, Fig. 148, page 648, and Fig. 150, page 651, (*loc. cit.*,) the first representing the 'extension of cancerous tumor into the fatty tissue about a lymphatic gland,' the second 'cellular infiltration of the fatty tissue in the periphery of a hard cancer of the breast.' Either figure might have been drawn from the altered fat in the sections of the two breasts described in this paper, and the appearances are such that, as Billroth well remarks, 'we can scarcely avoid thinking that in these cases, also, white blood-cells escaping from the vessels cause the cellular infiltration.' With this suggestion I heartily agree, but the real and difficult point in the analysis of cancerous tumors, as of so many pathological transformations, is to define with precision the exact part which the emigration of white blood-cells plays in the process, how far it is

the principal, how far merely the accessory alteration. This report is offered as a preliminary contribution to the study of this question, now become so important in reforming our pathological doctrines. I may mention in conclusion that the microscopical sections referred to were all made by Dr. E. M. Schaeffer, and that they are permanently preserved in the Microscopical Section of the Museum, where they may be examined by any one interested in the subject."

The great mistake which appears to have been made by the older authorities in relation to the pathology of cancer has been in investigating it as a special disease, without due regard to the particular organ or part of the body in which it may have been developed.

This error is now being corrected, and we are beginning to learn something of the true nature of this formidable disease.

A diligent examination of the investigations of others, and the careful analysis of a comparatively large number of cases which have come under my own observation, induce me to believe—

First. That cancer is not constitutional in its origin, but the result of a slowly transpiring interstitial inflammation, dependent upon local irritation.

Secondly. That there is no specific cancer-cell, the cells found in the connective-tissue stroma being altered epithelial cells or the white corspuscles of the blood, their different appearances in different forms of cancer being dependent upon the stage of the disease and the organ in which it is developed.

Thirdly. That the probability of secondary cancer occurring after the ablation of a primary tumor depends upon the richness of the part in lymphatics and the stage of the disease.

Frequency of the disease.—The absence of a proper system of registration in this country precludes the possibility of furnishing reliable statistics of this disease. Indeed, the tables of mortality of England are not strictly correct, although the approximation to exact results is sufficiently close to render them exceedingly valuable.

The entire number of deaths from cancer reported as occurring in England, Ireland, and Scotland, from 1851 to 1871, was 124,740. Of these, 31,816 were males and 92,924 females; the excess, 61,108, of the females over the males being attributed to cancer of the uterus or mammæ.

In proportion to population, the death rate from cancer in Paris is largely in excess of London, and this, I think, can readily be explained by a consideration of its causes.

In the large cities, as compared with the rural districts, the rate of death from malignant disease is much higher. M. Tanchou computes the deaths from cancer in the arrondissements of Sceaux and St. Denis at 1.63 per cent. of the total mortality of the suburbs, while intra-muros, or in Paris proper, the estimate is 2.54 per cent., showing that this disease is much more frequent in the capital than its environs.

In England the frequency of cancer in the counties, as compared with London, is in the proportion of 1 to 1.4406. The remarkable agreement in these proportional numbers, deduced from two independent registers, would seem to justify the conclusion that city life is favorable to the production of cancer.

In the Department of the Seine, the mean of ten years from 1830 to 1840 of deaths from cancer was 0.75501 to every 1,000 living. In England and Wales the mean for the same time was 0.18954 for every 1,000 living.

After making every allowance for the difference in the system of registration in the two countries, we shall find the mortality from cancer in the department of the Seine to be nearly four times greater than it is in England and Wales.

In America it is impossible to ascertain the relative proportion of cancer to other fatal diseases; but, from all the available data, I am satisfied that the proportion is very largely in excess of that of Great Britain or France; and that, within the last ten years, the numbers afflicted with this disease have increased out of proportion to the increase in the population.

No calculation as to the general frequency of the disease can be made from the reports of hospitals set apart for the special treatment of females, but a very correct estimate can be obtained of its proportion to all other diseases to which women alone are subjected.

The general law governing disease appears to exercise little influence on cancer. Concentration of population and imperfect hygienic surroundings do not increase its frequency.

In 470 deaths from cancer occurring in thirty-one of the Unions or

parishes in London between July, 1837, and December, 1838, we find the following anomalies:

Thirty-one unions.	Population in 1838.	Deaths from cancer.		
		Males.	Females.	Total.
A. 10, most unhealthy....	517,288	14	82	96
B. 11, medium salubrity..	505,746	36	103	139
C. 10, healthiest.....	787,785	46	189	235

From this it would seem that the mortality from this cause increases with the salubrity of the locality; a result which is rendered more startling by comparing it with the calculations of Mr. Farr, of the annual mortality from all diseases, from typhoid fever, and from phthisis in the same districts, as exhibited in the following table:

Districts.	No. of square yards to one person.	Annual general rate of mortality per 1,000 living.	Annual rate of mortality per 1,000 from—		
			Typhoid fever.	Phthisis.	Cancer.
A.	57	33.21	3.24	4.78	0.124
B.	78	28.39	2.05	4.51	0.183
C.	219	21.63	1.07	3.54	0.199

If cancer was the result of a general blood-poisoning, if a pre-existing cachexia was necessary for its development, we should naturally look for an increased number of cases among the lower classes, who inhabit poorly-ventilated houses in unhealthy portions of large cities, as we find all other blood-diseases fearfully increased among that class of the population, but the reverse is the case.

Temperament.—Persons of lymphatic temperament are much more prone to this disease than those of sanguine or sanguineo-nervous. Of 167 cases, coming under my own observation, 123 were of lymphatic temperament, and 44 of sanguine or sanguineo-nervous.

Age.—In Europe, of 1,000 cases of carcinoma uteri and mammæ, in which the statistics were collected—

32 were between 20 and 30 years.
107 " " 30 " 35 "
126 " " 35 " 40 "
189 " " 40 " 45 "
280 " " 45 " 50 "
162 " " 50 " 60 "
84 " " 60 " 65 "
20 " above 65 "

More than half of the entire number occurred between the ages of thirty-five and fifty. In this country, so far as my limited observation has extended, the larger number of cases occur between the ages of thirty-five and forty-five. Of the 167 cases referred to above none were under 30—

11 were between 30 and 35 years.
44 " " 35 " 40 "
77 " " 40 " 45 "
23 " " 45 " 50 "
12 " above 50 "

According to Mr. Paget's tables, the larger number of cases of cancer occur between the ages of forty-five and fifty. In this country, women develop, mature, and fail earlier by at least five years than English women. This anticipation of five years in the decadence of American as compared with English women reconciles the difference in the two tables. Of the 2,781 cases, the statistics of which were collected and reported by M. Le Roy d'Étiolles, as occurring in France, 1,227 were above forty, and 1,061 above sixty, leaving 493 below forty. (London Lancet, June 3, 1843.)

Menstruation.—Whether scanty, profuse and painful, painful, postponing, irregular, or anticipating, appears to have no special connection with the development of cancer.

Fecundity.—It has been asserted by many authorities, though ample proof to the contrary has long since been adduced, that single women, and those who were sterile, were most liable to be attacked by cancer. The truth is the direct reverse of this statement.

Out of 134 cases of carcinoma uteri reported by Dr. West, but 3 were single women, and only 8 were sterile; in other words, there was but 1 sterile

marriage in 16.3 of the cancer-patients. In St. Bartholomew's Hospital the average is 1 sterile marriage in every 8.5.

The further we extend this inquiry the stronger becomes the evidence that extraordinary fecundity predisposes to cancer.

After deducting the 3 single and 8 sterile cases from the above 134 cases, we have 123 women whose marriages had been fruitful, they having been pregnant 844 times; 685 of the pregnancies terminated at full term and 158 prematurely, the average being 6.8 pregnancies to each woman, with 5.5 children born at full period, and 1.2 miscarriages.

The average number of children born to each married woman in England is 4.

The following table shows the number of pregnancies to each of these 123 women, the number of children born to each, and the number of abortions, and, as will be seen, there were only two out of the whole number whose pregnancies resulted in nothing but abortion:

Number of women.	Pregnancies to each.	Number of women.	Children to each.	Number of women.	Abortions to each.
13	1	14	1	28	1
13	2	13	2	17	2
10	3	15	3	8	3
4	4	8	4	4	4
9	5	14	5	6	5
13	6	12	6	1	7
13	7	12	7	1	8
7	8	8	8	1	11
8	9	7	9	..	..
6	10	7	10	..	..
9	11	2	11	..	..
6	12	3	12	..	..
5	13	2	13	..	..
2	14	2	14	..	..
1	16	1	17	..	..
1	18	1	18	..	..
1	19	..	..	..	..
1	20	..	..	..	..
1	24	..	..	..	..
123		121		66	..

In 14 of the 123 cases referred to by West, the symptoms of cancer were discovered almost immediately after the termination of pregnancy, or at least within a sufficiently short period to connect the disease with the changes occurring in the puerperal state.

In the 167 of my own cases of cancer of the uterus and mammæ referred

to in the following table, and of which I have retained full notes, all had been married or borne children.

Number of patients.	Number of pregnancies to each.	Number of children to each.	Number of abortions.	Total number of children.	Total number of abortions.
17	2	2	..	34	..
15	3	3	..	45	..
5	3	2	1	10	5
7	3	..	3	..	21
23	4	4	..	92	..
13	4	3	1	39	13
5	4	1	3	5	15
1	4	..	4	..	4
3	5	5	..	15	..
11	5	3	2	33	22
7	6	4	2	28	14
1	6	1	5	1	5
3	6	..	6	..	18
3	7	7	..	21	..
8	7	4	3	32	24
4	7	2	5	8	20
2	8	8	..	16	..
10	8	5	3	50	30
3	8	2	6	6	18
1	9	6	3	6	3
1	10	8	2	8	2
24	Sterile.				

From the above table it will be seen that among the 167 women there were 663 pregnancies, 449 children at full term, and 214 abortions. With 33 more patients than West reports, there were 180 less pregnancies, and 56 more abortions. Upon reflection we must ask ourselves the question, "Are English women naturally more prolific than American, and is the crime of abortion more prevalent in this country?"

These tables do not strengthen the theory of the constitutional origin of carcinoma uteri, but rather show that it is the result of imperfect or perverted nutrition of the part, consequent upon the often-repeated changes in its tissue which occur during the puerperal state; and that those women who have undergone these changes most frequently are the more liable to its attack.

Hereditary influence.—Until quite recently, authorities were agreed upon the constitutional origin of cancer, and so generally was this opinion received among the profession and laity that the strongest objections have been raised

against marrying into a family where one of its members had died of cancer; it being regarded as almost certain that the disease would be transmitted. Many a woman's life has been made wretched by the constant fear that in herself would be developed eventually the fearful malady from which her mother suffered. Let us carefully examine the ground upon which this universal belief has rested, by appeal to the cancer records.

Of 160 cases of cancer of all parts collected by Paget,* 26 presented, as he terms it, "the history of hereditary cancerous taint," or 1 in 6.1. In 102 cases, referred to by Lebert,† the same fact was ascertained in reference to 14, or 1 in 7.2. In 8 out of 49 cases of cancer of the womb, referred to by West, the following was the history: in 1, the father had died of cancer of the throat; in 2, the mother; in 4, the sister had died of cancer of the womb; and in 1, the sister had died of cancer of the breast. In 21 of the cases to which I refer, some one of the members of the family had died of cancer, or at least it was so supposed; but 6 of these 21 were believed to have died of cancer of some internal organ, but no post-mortem examination had been made, leaving room for considerable doubt. If we take the whole number of these cases, and they constitute a fair average, we shall find that, out of the 478, there existed what has been termed hereditary taint in 69, or 14.5 per cent. Could we find 478 patients afflicted with any disease as common as cancer, for instance, "pneumonia," which no one suspects of being hereditary, and not discover as many as 69 out of the number whose parents or near relations had "pneumonia" before them? Are we on that account to aver that the disease is hereditary, and the result of a constitutional taint? By no means; and yet on this slender basis rests the whole theory of the hereditary character of cancer. M. Le Roy d'Etiolles collected with much care and accuracy the history of 2,781 cases of cancer occurring in France, and reports that 54 per cent. of the whole number occurred in the breast and uterus, and that *only* 1 in 278 presented a history that would permit of a supposed hereditary transmission. (London Lancet, June 3, 1843.)

Causes.—Whatever tends to excite a slow interstitial inflammation of the cervix uteri at the time of life when the tissues are more prone to retrograde than progressive metamorphosis.

Acute inflammation allowed to degenerate into a sub-acute or chronic form.

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*Op cit., vol. ii, p. 538. †Op cit., p. 134.

Repeated parturition, inducing imperfect involution, which terminates in a slow grade of inflammation.

Abortion, especially when often repeated, is one of the principal exciting causes. In my judgment, the percentage of deaths from cancer in cities in excess of the rural districts is mainly due to the habit among some fashionable women of procuring criminal abortions whenever they find themselves pregnant, not desiring to increase their families or have their pleasures interrupted by maternal duties.

My own experience has been the reverse of that of Dr. Gaillard Thomas, who says he has never found a case remotely sustaining the position that chronic inflammation was an exciting cause.

I have seen very few cases where the history did not unmistakably point to this condition as the exciting cause of the disease.

The older writers were not far wrong when they described cancer of the uterus as a disease slow in progress, continuing in its first quiescent stage of scirrhus not only for months but for years, and then, excited by one knows not what cause to activity, passing into the state of ulcerated carcinoma, and thus at its close quickly destroying the patient.

They confounded the pre-existing state of chronic inflammation and induration of the cervix with its sequelæ, "cancer."

Paul of Ægina, in referring to carcinoma uteri, remarks: "The uterus becomes scirrhous sometimes all at once without any preceding complaint, *but most frequently after having been preceded by inflammation, which has neither been resolved nor converted into an abscess.*"

Rindfleisch, who writes twelve centuries after, and is to-day one of the highest authorities, remarks: "According to my comprehension, the question in hard, glandular carcinoma is about *a slowly transpiring interstitial inflammation, whose cellular products are converted into epithelial structures instead of pus or connective tissue.*"

The relation of chronic metritis to malignant disease of the uterus has been traced by some observers so directly that there would scarcely seem to be a doubt that the minor is frequently transformed into the major disease.

Dr. E. Noeggerath, in a paper read before the New York Academy of Medicine, and published in the American Journal of Obstetrics, vol. 11, p. 505, relates a number of cases where he had amputated the cervix for cancerous disease *supervening upon chronic metritis.*

Astruc claims that a large majority of cases of carcinoma uteri are the result of abortion.

Récamier, Lisfranc, and still later Ashwell, Montgomery, Duparcque, Blatin, and Nivet, express their belief *that scirrhus results from chronic inflammation of the parenchyma*, and in this they simply indorse the opinion of Galen, Pierry, Andral, Paul of Ægina, Broussais, Breschet, Bouillaud, and many others.

Treatment—Curative, Palliative, and Prophylactic.—When the disease is fairly established in the neck of the uterus, or in any external portion of the body, complete removal by some one or other of the following means is the only chance for saving the life of the patient: Excision by the knife or écraseur; destruction by some powerful caustic, by the actual cautery, or by compression; and the probabilities of success will depend upon the stage of the disease, and the constitution and temperament of the patient.

If we are to rely upon statistics, the success attending the removal of cancerous growths is so small that little inducement is held out to the surgeon to undertake the operation; nor must it be supposed that the long list of failures is due to any want of skill or good judgment on the part of the operator when once the operation has been decided upon. I fear, however, that extreme caution sometimes induces my professional brethren to delay surgical interference until the symptoms of the disease are so strongly pronounced that the case becomes hopeless. Removal by excision to be successful must be performed early, at a time when the knife can get behind the disease, which means, according to the modern pathological views, "before the altered epithelial cells, or white blood corpuscles, have escaped into the lymphatics and gotten beyond our reach, and by their aggregation and multiplication in contiguous parts given rise to secondary disease." That this takes place much earlier in some patients than in others, the history of reported cases furnishes abundant evidence.

We find in some instances when the tumor has been removed in the early stage of the disease, that a secondary growth has appeared within a few weeks afterward, and, in others, when an operation has been performed as a mere palliative measure, there has been no return of the disease, either at its original site or in any distant organ. As remarked in an early part of this article, we have improved little in the treatment of cancer within the

last eighteen hundred years. As a mere matter of interest I will refer to some of the oldest authorities on this subject.

Claudius Galenus, or Galen, A. D. 170: "Cancer is only curable at its commencement; when it has attained any considerable magnitude, it admits of no remedy without a surgical operation. Cancer of the womb, it is neither expedient or possible to operate upon." * * * * * *

"If ever you attempt to cure cancer by an operation, begin by purging the melancholic humor, and, having cut away the whole affected part so that not a root of it be left, permit the blood to be discharged, and do not speedily restrain it, but squeeze the surrounding veins so as to force out the thick part of the blood, and then cure the wound like other ulcers."

Hippocrates, B. C. 460, forbids the surgeon from interfering with occult cancers, that is to say, with such as have not ulcerated, remarking, "that if healed the patient soon dies," whereas, "if let alone, he may live a long time." (Aph., vi, 38.)

Aëtius, A. D., 500, the first Christian physician whose writings have come down to us, gives the following description of the operation on a cancerous mamma: "Laying the patient in a supine position, I make an incision into the mammæ above the cancer, and immediately apply a cautery until an eschar be produced to stop the bleeding; I then make another incision, dip into the substance of the mammæ, and again burn the parts, and so proceed, first cutting and then burning; in this way there is no danger of hæmorrhage. After the amputation has been completed, I again burn the parts until they are quite dry."

Haly Abbas recommends extirpation by the scalpel when the cancer is seated in the extremities or in the mammæ, and advises to allow the part to bleed for some time to wash out any of the melancholic humor, but does not advise the application of the hot iron.

Albucasis says he never saw a case of cancer cured by extirpation, unless it was small and recently formed; but when the mamma is removed, if there is a redundancy of flesh, he makes two lunated incisions, and removes the intermediate skin with the gland, and when the hæmorrhage has ceased brings the two edges together with sutures.

Soranus, A. D. 53, recommends the extirpation of the cancerous breast when not adherent to the ribs, but when adherent considers the operation unjustifiable. He remarks that in scirrhus there is little danger from hæmorrhage.

In cancer of the uterus, our remedies are mostly palliative, as we are seldom called upon to see the patient sufficiently early to permit of any truly remedial measures.

If the disease is confined to the vaginal portion of the cervix, and the contiguous tissues are not implicated, the indications are to remove the neck as high up as possible, without endangering the peritoneal cavity.

The following is the method I adopt: The patient being placed on her left side, and the parts exposed by the duck-bill speculum, the cervix is seized by a strong volsella, and sufficient traction made to bring it fairly within reach; it is then severed by a pair of strong blunt-pointed scissors, cutting from the periphery toward the center, first on the right, and then on the left side. There is less hæmorrhage in the use of the scissors than the knife; what little bleeding occurs is easily arrested by penciling the raw surface with a crystal of the persulphate of iron.

There is considerable danger in the use of the écraseur, the tightening chain being apt to draw in more tissue than was intended to be removed; it has, in some instances, torn through into the peritoneal cavity.

Dr. Sims mentions a case in which this accident occurred to him when operating in the presence of Dr. V. Mott.

When the disease has advanced too far to permit of amputation of the cervix, our treatment will necessarily be confined to palliative measures, for the purpose of retarding the ulceration, relieving the pain, and destroying the fetor of the discharges.

I have found pure bromine more effective than any other caustic in arresting rapidly destructive ulceration. It appears to permeate the tissues more thoroughly than any other with the operations of which I am acquainted; it requires to be used with great care, not only with respect to the patient, but to the operator—care to the patient in order to protect the sound parts from its corrosive action—and care on the part of the operator to avoid inhaling its fumes, which produce severe bronchitis.

To destroy the fetor of the discharges I use bromo-chloralum; carbolic acid is equally effective, but it has an unpleasant odor, and is on that account objectionable. To relieve pain I have found nothing so efficient as morphine. In the early stages, conium has answered well, but in severe paroxysms it is not sufficiently powerful.

With all the resources of modern surgery, and the entire armament of the

materia medica, our best efforts fail in arresting the disease when once established in the uterus, and scarcely are we able to mitigate the sufferings of its unfortunate victims or retard the fatal issue. Hence it behooves us to endeavor to prevent what we are compelled to admit cannot be cured. If chronic inflammation of the cervix in some constitutions results in carcinoma, will it not be good practice to amputate the cervix whenever the disease is found intractable to ordinary remediable measures? Why not give the patient the security which this operation affords?

It may be argued that we have no evidence that she would suffer from malignant disease. True, we have no absolute evidence that such would be the sequela; but the probabilities are strongly in its favor, and even were nothing more to be dreaded than a continuation of the existing disease, amputation of the diseased part would be the best treatment that could be pursued, for quite a large majority of these cases of chronic cervical metritis are incurable by any other means. They yield apparently for a time, but only to return with increased obstinacy. (See *Cervical Metritis.*)

The operation itself is devoid of any special danger, and, contrary to what might be expected, the function of the organ remains unimpaired. I have delivered three women at full term from whom I had previously removed the cervix uteri,and the only appreciable effect which I noticed was a shortening of the labor.

Lisfranc successfully amputated the cervix ninety-nine times. It is now a common operation with every gynæcologist, and with a little care always successful.

It must not be understood that I recommend amputation of the cervix uteri for chronic inflammation as an operation to be resorted to in the early stages of that disease, but only when all other means of resolving the inflammation and induration have failed. I then resort to it as a curative and prophylactic measure.

Cancer of the Uterus.

Case 1.

Mrs. S. L——; aged thirty-seven; admitted to hospital January 12, 1867, by request of Dr. F. Howard; American by birth; has been married twice; pregnant eight times; has given birth to three children, the youngest being seven years of age. Her abortions had not been the result of accident, but of design.

The history of the case, as detailed by herself, was as follows: "I enjoyed perfect health until after the birth of my first child, from which I did not recover for several months, having been attacked on the fourth day after its birth with child-bed fever. My next five pregnancies I stopped between the second and third months by the use of a catheter. I suffered little from their effects, at least, noticed but little difference in my feelings, for I was never well, always having pain in my back and some discharge from the womb. Intercourse with my husband was painful, and sometimes almost intolerable. Being told that my health might improve if I had another child, I consented to go the full term, and my last child was the result. I was, however, disappointed, for I experienced no benefit, but, on the contrary, felt weaker than before. I tried to nurse my child, but was unable to do so.

"The last year I have been perfectly helpless, and my agonies beyond description. When night came I prayed for morning, and when morning came I prayed for night. During the past few months I have had repeated hæmorrhages, which generally continued until I lost consciousness."

The patient was brought to the hospital apparently in a dying condition; her appearance characteristic of her disease. She was thin to emaciation; complexion waxy; pulse 140; constant nausea, vomiting whatever was taken into the stomach; colliquative diarrhœa and sweats. About six hours after her admission she was attacked with a violent hæmorrhage, which was controlled by a tampon introduced into the vagina. Brandy and morphine were freely administered per rectum.

January 14.—The tampon was removed and a careful examination of the uterus made. The vaginal portion of the cervix was completely destroyed, the vaginal mucous membrane terminating in a chasm, which opened into the uterus, and was sufficiently large to permit the finger to pass easily into its cavity, which was irregular and hard, presenting the characteristics of cancer.

The vaginal mucous membrane appeared free from the disease, the line of demarkation being distinct. The ulceration in this case had passed upward into the body of the uterus, which was rapidly undergoing destruction.

Before her admission she had taken large quantities of morphine, as much as three grains having been administered in six hours during severe paroxysms, with little apparent effect.

The condition of the patient was utterly hopeless; she had become so accustomed to narcotics that they were almost useless as a means of allaying pain; her passages were involuntary, the constant nausea prevented any nourishment being administered, the cheeks and fauces were covered with an aphthous deposit, and the breath partook of the general fetor of the discharges. Death was evidently approaching in its most revolting form.

A case so desperate justified the trial of any means that could be suggested to alleviate the more distressing symptoms, and, after consultation with Dr. F. Howard, whose patient she was, it was determined to try the effect of the local application of bromine, as suggested by M. Landolfi. In this case pure bromine was used instead of the paste recommended, for which the following is the formula:

Chloride of bromine, ℥iij;
Chloride of zinc, ℥ij;
Chloride of antimony, ℥j;
Chloride of gold, ℥j;

to which, when thoroughly mixed, add enough liquorice to form a paste.

The woman, being too low for the administration of any anæsthetic, was placed on her back and the uterus exposed by an ordinary glass speculum, it being preferred in this case to the duck-bill, as it protected more perfectly the sound parts from the corrosive action of the caustic. Small pieces of sponge were passed into the uterus until it was packed full; a hard-rubber syringe being charged with pure bromine, and the long nozzle insinuated through the pieces of sponge up to the fundus, the piston was slowly pressed down, permitting the bromine to flow out in drops, which were instantly absorbed by the sponge. A piece of dry sponge was placed over the opening into the uterus to absorb any of the bromine which might escape with the discharges, and around this cotton soaked in castor-oil was packed to protect the mucous membrane of the vagina.

No increased pain was experienced from the application, and for some days no apparent benefit resulted. The patient was sustained by injections of beef-essence, milk-punch, and brandy. A morphine suppository was introduced every six hours. The tampon was removed on the second day, and for several succeeding days a large number of sloughs were thrown off with the *débris* of the sponge; no unpleasant odor accompanied the discharges, which proved a great relief to the patient and attendants.

February 7.—Fourteen days after the application of the bromine. There

was a very decided improvement in the condition of the patient; the bowels were under better control, and less nausea existed; she retained a little milk and lime-water. The pain was still severe, but she described it as being of a different character.

The bromine was again applied in the same manner as before, and with the same precautions for the protection of the sound parts. The tampon was removed on the second day, and no discharge of any kind was observed for at least forty-eight hours, after which time the sloughs commenced coming away, and continued to do so for ten days or more. During this time the patient was slowly but surely improving. All nourishment and stimulants were given by the mouth, and retained. Morphine suppositories were continued. The uterus was washed out several times daily with warm water and glycerine.

March 3.—Considerable hæmorrhage followed the uterine injection, but it was readily controlled by the local application of tincture of perchloride of iron. Citrate of iron and quinine was exhibited internally. From this time until April 16th the general improvement continued; there had been no return of the hæmorrhage, and but little pain. A careful examination showed the cavity of the uterus to be smooth, and, as far as could be ascertained, free from suspicious tissue, but it was thought better to re-apply the bromine thoroughly to its entire surface. The duck-bill speculum was used on this occasion to expose the part, and unfortunately some of the bromine came in contact with the vaginal walls and caused quite an acute inflammation, which, however, was easily arrested by the application of glycerine and Goulard's extract of lead. Acute pain followed the use of the bromine on this occasion, and for some days my patient was much worse, and all that had been gained seemed on the verge of being lost.

The thin shell of uterine tissue was not sufficient to protect the peritoneum from the action of the caustics, and peritonitis resulted. The pulse went up to 140, and the patient fell into a semi-comatose condition. From this condition she rallied, the pain subsided, her pulse came down to 110, her appetite returned, and she became quite cheerful.

May 24.—The change that had taken place in this case was no less surprising than gratifying. She was able to walk about the room, quite free from pain or discharge of any kind, her appetite and digestion good, and she was rapidly gaining strength.

June 3.—Upon examination the uterine walls were found extremely thin, but apparently healthy; there was no abnormal discharge from the vagina, and the health of the patient had become restored. She was advised to continue some preparation of iron for a few months.

June 4.—Discharged.

I occasionally visited this lady for several months. She was keeping house, did her own marketing, and superintended her domestic concerns. She assured me that she was in better health than she had been for years.

About eight months after leaving the hospital she went with her husband to reside in New Jersey, where she died twelve months afterward from pneumonia, as stated by her attending physician.

I have no comment to offer on this remarkable case; the facts must speak for themselves, and be taken for what they are worth.

Carcinoma uteri.

Case 2.

R. S——; aged thirty-six; admitted January 7, 1867; American by birth; married when she was eighteen years of age; had never borne children, or been pregnant. She had suffered for several years from all the symptoms of uterine disease, but had not submitted to an examination. She complained of intense lancinating pain in the region of the womb, more severe at times, constant pain in the loins and hips, and painful micturition; offensive discharge from the vagina, excoriating the thighs and labia.

Examination.—Posterior lip of os uteri destroyed; anterior lip hard and nodulated; the body of the uterus large and intensely hard, but not fixed in the pelvis; the broad ligaments thickened.

There was nothing to be gained by amputating the cervix, as the disease had advanced far beyond its boundary. All that could be hoped for was to relieve pain by the destruction of as much of the diseased tissue as was within reach.

January 12.—The galvano-cautery was applied freely to every accessible part, and a suppository, containing one grain of morphine, introduced into the rectum.

January 13.—She had suffered considerably during the night, but was easier.

Injections of tepid water, with Labaraque's solution, were administered

two or three times daily, followed by morphine suppositories. The sloughs resulting from the cautery separated slowly, and it was not until the tenth of February that the parts were in a condition to admit of further interference. The os was then found sufficiently patulous to admit of the introduction of small pieces of sponge into the uterine cavity, and it was determined to apply the bromine, as was done in Case 1 with such good results. The application caused no additional pain, but failed to give the relief hoped for. The sloughs came away slowly, and the discharges were excessive, but not fœtid.

March 8.—The cavity of the uterus was smooth, the ulcer on the anterior lip and that remaining from the destruction of the posterior lip looked healthy.

The patient, being anxious to leave for her home, was discharged March 12. She died July 7, 1867.

Commentary.—The bromine was not applied in this case with any hope of curing the disease, but to destroy as much of the cancerous growth as was within reach, hoping thereby to lessen the pain and alter the character of the discharges. In the first it failed; in the second it accomplished what was desired.

Carcinoma uteri.

Case 3.

Mrs. G——; aged forty-one; admitted March 1, 1867; has been pregnant seven times; given birth to three children at full term, and had four miscarriages. She complains of a dull aching pain in the back, from which she has suffered for more than five years; does not think it any worse now than formerly; within the last three months she has had several hæmorrhages, and noticed an alteration in the character of the vaginal discharges, which had become watery and offensive.

Examination.—Cervix uteri entirely destroyed; uterus of stony hardness and fixed in the pelvis; neither bladder nor rectum apparently involved. From the general appearance of the patient, no suspicion would have been entertained that she was the victim of a malignant disease. She was plump, well nourished, of a healthy complexion, and cheerful.

After being informed of the nature of her complaint, she continued as

cheerful as before, but refused to permit of any remedial or palliative treatment, not even consenting to the administration of a grain of opium.

There was no apparent change in the condition of this woman up to April 26, when she was attacked with hæmorrhage from the stomach and vomiting, which was arrested by the application of ice.

April 27, 10 *a. m.*—Sinking rapidly; she died at 11 p. m. During the last six hours of life her cries were most distressing, being similar in character to the hydrocephalic cry of children.

Carcinoma uteri.

Case 4.

L. I——; aged thirty-nine; admitted June 16, 1867; married at nineteen; first child born when she was twenty. Second pregnancy resulted in miscarriage, and second child was born sixteen months after the first. The next pregnancy occurred when the second child was four months old, and she aborted at the third month. Again she became pregnant and aborted about the same time; twelve months afterward, became pregnant again and continued the full term. From the birth of this child she fully recovered, and enjoyed perfect health more than eight years, when she became pregnant with her last child, of which she was delivered at full term. From the birth of this child her recovery was very slow, she not leaving her bed for more than five weeks.

She went abroad for the first time when her infant was nine weeks old. In getting out of a car, in which she had been riding, her foot slipped, and she came suddenly down, giving herself a severe shock, and causing great pain in the lower part of the abdomen.

Acute metritis followed, and she was confined to her bed for four months. From this sickness she never fully recovered, complaining of constant pain in the back, painful micturition and defecation, continuous discharge from the vagina, and pain during coitus.

Examination.—Cervix large, hard, and nodulated; body of uterus large and hard; pressure in the posterior cul-de-sac causing great pain; uterus immovable.

The discharge was light-colored, muco-purulent, and inoffensive.

The treatment was merely palliative and sustaining, as injections of

antiseptic lotions, iron and quinine internally, and suppositories of morphine to allay pain. As no cure could be promised, she left the Institution to return to her home on August 3.

This lady fell into the hands of some quack, who promised to cure her, and under whose treatment she died March 23, 1868.

Commentary.—The rational conclusion in this case is, that the metritis from which this patient suffered after the birth of her last child, and six years prior to her admission into the hospital, was never completely subdued, but remained in a chronic form, and terminated in the attack of cancer. When the existence of the disease was discovered, it had advanced too far to admit of any surgical interference.

Carcinoma uteri—Amputation of cervix.

Case 5.

F. E——; aged thirty-seven; admitted July 17, 1867; American by birth; temperament phlegmatic; was married at fifteen; is the mother of seven children, and has never miscarried. Her general health has been good until the last two years, since which time she has suffered from pain in the back, loins, and breasts, vaginal discharge, and a feeling of general *malaise.*

Examination disclosed the cervix large, hard, and nodulated; os patulous for three-quarters of an inch; the internal os and uterine cavity apparently normal.

The body of the uterus being uninvolved, and the upper part of the cervix apparently free from disease, it seemed to be a proper case for amputation, and its removal was accordingly advised.

It being inconvenient for the woman to remain at the hospital, the operation was performed at her own house.

The patient having been placed on her left side, the parts were exposed by the duck-bill speculum; the cervix seized by a volsella, drawn down and severed close to the reflection of vaginal membrane. No provision was made for flaps, but the stump left to heal by granulation.

All her distressing symptoms were relieved in the course of a few weeks, and she became eventually restored to perfect health.

A microscopical examination of a portion of the tissue removed proved it to be a case of epithelioma.

I delivered this woman of a child at full term, in February, 1872. The labor was normal, the recovery rapid, and no evidence existed of any return of the disease.

Carcinoma uteri.

CASE 6.

Mrs. T——; aged forty-four; admitted May 12, 1867; American by birth; temperament phlegmatic; married at nineteen. She enjoyed good health until thirty years of age, when, uterine disease being manifest, she consulted a physician, under whose care she recovered, and shortly after became pregnant for the first time.

A miscarriage occurred at the sixth month, brought on by a fall down the cellar-steps of her house.

This accident was succeeded by slow but apparently sound recovery. She again became pregnant, and aborted at the third month without any apparent cause.

Three more pregnancies and a like number of abortions followed. Her recovery from the last left her with a feeling of uneasiness in the pelvis and pain in the back, which increased, and for which she again consulted her physician, under whose care she remained for more than two years, with slight evidence of improvement. Her general health declining, she was advised to return to her native State, California. This she did, remaining there more than a year, with much apparent advantage, having grown stout and strong.

April 3, 1867.—She returned to her home in Washington, the only annoyance from which she then suffered was an offensive watery discharge from the vagina, which had been of some months' duration, but unaccompanied with pain.

Examination.—Uterus large, hard, and fixed in the pelvis; cervix enlarged and the posterior lip of os destroyed; the ulceration had invaded the anterior lip.

The hospital accommodations not permitting her husband to be with her, she was unwilling to remain, and left the institution May 25.

I was informed by her husband that she continued in the same condition for about three months after leaving the hospital, suffering no pain, but he thought, perhaps, a little weaker. On July 8, she was seized with a violent convulsion, passed into a comatose condition, and died July 11.

The interesting features in this case were, first, the closely traceable origin of the disease to the metritis resulting from the frequent miscarriages; and secondly, the entire absence of pain throughout the whole course of the malady; her sudden death rather pointing to some cerebral disease (possibly emboli) as its immediate cause, than to any of the ordinary lesions discoverable in these cases.

Is it not more than probable that the cancerous disease in this case would have been prevented by an early amputation of the cervix, a removal of the part undergoing slow interstitial inflammation, before that inflammation had traveled upward and attacked the body of the uterus?

Carcinoma uteri.

CASE 7.

Mrs. F——; aged fifty-five; admitted November 24, 1867; American by birth; sanguine temperament; mother of four children, the youngest eighteen years of age; has been a widow fourteen years. Since the birth of her last child she has been suffering from uterine disease; has been treated on several occasions for ulceration of the cervix. While under treatment she would improve, but shortly after the discontinuance of the local applications her condition would be as bad as before their commencement.

For the last ten months she had suffered intensely from lancinating pains in the lower part of her abdomen; profuse watery discharge from the vagina, of very offensive odor, excoriating the thighs and labia; had had no hæmorrhages.

Examination.—The vaginal portion of the cervix was completely destroyed, the ulceration spreading over the posterior cul-de-sac. The uterus was free, but enlarged and hard, its cavity lined with friable cancerous tissue which bled at the slightest touch.

It was determined to give this woman the benefit of a thorough application of the bromine, which was applied in the same manner as in Case 1, and repeated every ten days for about two months. No improvement was observed; the pain was not lessened or the discharge diminished. The ulceration continued to extend, eating through into the rectum, and finally into the peritoneal cavity.

Large doses of morphine were administered to check the peritonitis;

for a time it was kept subdued, but eventually became unmanageable, and the patient succumbed March 14, 1868.

This was another instance in which the disease was traceable to a pre-existing sub-acute inflammation of the cervix, and the patient might probably have been saved by its early amputation.

The grandmother of this woman died of cancer of the breast; her father and mother both lived to a good old age.

Carcinoma uteri.

Case 8.

Mrs. S. S——; aged thirty-nine; admitted September 11, 1868; American; temperament lymphatic; mother of three children, the youngest four years of age. Her general health has been good until the last year; she has suffered since her marriage from pain in the back, and leucorrhœa; her labors have been short, but her convalescence has always been slow, and, with the last child, imperfect.

Her general appearance indicated suffering; she was pale and emaciated; complained of constant nausea; severe pain in the back and rectum, and intense weariness; leucorrhœal discharge abundant and offensive; for several weeks before admission she had been troubled with diarrhœa.

Examination.—Cervix uteri destroyed by ulceration which had extended into the body; uterus not fixed in the pelvis; vaginal mucous membrane not involved.

Bromine was applied four times, at intervals of ten days, which alleviated the pain, reduced the amount of discharge, and destroyed all the unpleasant odor; but the disease steadily progressed, and the ulceration extended to the bladder, forming a vesico-vaginal fistula.

The patient being aware of the hopelessness of her case was unwilling to remain in the hospital, and returned to her home, where she died June 7, 1869.

After July 1, 1869, no detailed history was kept of cases of carcinoma uteri. The general plan of treatment pursued in all cases was the same as in those reported, viz, bromine to retard the specific ulceration and alter the character of the discharges, morphine or conium to allay pain, and injections of bromo-chloralum as an antiseptic.

The general result has been unfortunately fatal. Case 1 is not to be

considered an exception to the rule, for I have no doubt the patient died of malignant disease of some internal organ, although her attending physician reported her death the result of pneumonia.

Carcinoma Mammæ.

CASE 1.

L. R——; aged forty-one; admitted August 7, 1866; American by birth; temperament bilious-lymphatic; mother of six children; has enjoyed good health from childhood. She complains of a tumor in her left breast, which is increasing in size, and occasionally the seat of sharp pain running up to the shoulder. Her family history, as far back as she could trace it, was clear from malignant disease.

Examination.—Both breasts were large, the left gland being the seat of a hard nodular tumor, painful upon pressure, and situated in the upper part of the breast; the nipple retracted and axillary glands enlarged; the skin was not adherent or discolored.

August 9.—Patient having been fully ætherized, an elliptical incision was made, including the nipple, and the entire gland removed. The axillary glands, although enlarged, were not removed, as the enlargement was believed to arise from the irritation in the breast, and not from any malignant deposit. No ligatures were used, the vessels being controlled by torsion. The edges were united by silver sutures and covered with lint soaked in carbolized glycerine, over which a compress was placed, and retained in position by a many-tailed bandage, so arranged as to secure gentle but regular pressure over every portion of the flaps.

August 13.—Dressings removed and every part found to be united; the sutures were allowed to remain, and the pressure still continued.

August 16.—Sutures removed, and the parts supported by adhesive strips.

August 27.—Patient discharged.

This patient was seen on the 10th day of February, 1872; there had been no return of the disease at that time, and she appeared to be in perfect health.

The tumor was examined at the United States Army Medical Museum and found to be scirrhous.

Carcinoma Mammæ.

CASE 2.

Mrs. K. M——; aged thirty; admitted August 13, 1866; Irish by birth; temperament sanguineo-nervous; married when nineteen years of age; mother of two children. Her health has always been good; does not recollect ever having been sick a day. When nursing her last child, who is three years of age, she noticed a small tumor in her right breast, not painful, and after weaning her child it was forgotten.

About six months before her admission she was accidentally struck in the breast by her husband's elbow. She complained of severe pain at the time, which soon passed off. A few weeks after this occurrence she observed a tumor, the size of a walnut, in the same part of the breast where she had previously noticed the small tumor when nursing. This had increased rapidly, and was the seat of severe lancinating pain.

Examination.—The right breast was enlarged, nipple retracted, and the skin for two inches above and below the nipple adherent and discolored; the entire gland appeared a mass of disease, but was not adherent to the deep tissue, and the axillary glands were not enlarged.

August 15.—The entire gland was removed, with as much of the skin as appeared involved in the disease; no ligatures were used; the parts were retained in apposition by silver sutures, a dressing of carbolized glycerine having been applied on lint, and compresses over all.

August 19.—Sutures removed; union by first intention was found to have taken place in every part. No constitutional treatment was considered necessary in this case.

September 20.—Patient discharged, perfectly well.

This woman was kept under observation for three years and seven months, at the end of which time there was no symptom indicating any return of the disease.

Carcinoma of both Mammæ.

CASE 3.

Mrs. A. E——; aged thirty-seven; admitted November 11, 1866; American; phlegmatic temperament; mother of four children, the youngest two years of age. Her general health has been good, but for the last

eight months she has suffered intense pain in both breasts. The pain commenced before she had weaned her youngest child, and the tumor in the left breast appeared soon after her last confinement.

The general appearance of the woman was healthy. She was very large, weighing over two hundred pounds; her breasts were enormous in size, the nipple of the right one retracted, and the skin for some distance around it adherent and purple in color. The nipple of the left one was not retracted, and the skin less discolored, but there was a deep, ragged ulcer, about the size of a silver dollar, situated to the right of and a little above the nipple; the axillary glands on the left side enlarged, but those on the right apparently uninvolved.

The serious nature of the disease was fully explained to the patient, as also the probability of its return if the breasts were removed; at the same time she was informed that the only hope of a cure was by extirpation of both glands. After consultation with her friends she decided to submit to the operation.

December 8.—Patient was fully ætherized, clinical class present. The right breast was first removed; the redundancy of tissue afforded abundance of skin for flaps after the removal of all that portion which appeared involved with the gland; the pulse remained good and respiration was easy. The operation was continued, and the left breast and axillary glands were removed. The hæmorrhage proved trifling, the divided arteries having been secured by torsion; no ligatures were used on either side.

The flaps were adjusted, and carbolized glycerine was applied as a dressing; compresses were so arranged that every part of the raw surfaces came in apposition. The patient was ordered one grain of opium every four hours, and nourishing diet.

December 9.—Had passed a comfortable night; pulse seventy-eight; soft and full; tongue moist; complains of soreness, but no special pain.

December 10, 11, and 12.—Patient easy; no constitutional disturbance whatever.

December 15.—Sutures removed, and every part found to be united. She complained of numbness in left arm and hand, which had been produced by the violence done to the axillary plexus during the manipulation for the removal of the glands of that part.

Gentle compression was continued for the following three weeks, at the

expiration of which time she was sufficiently recovered to require no further attendance.

January 11, 1867.—Patient discharged, with orders to report herself for observation every three or four months; which was done until the latter part of 1870, when she left the city, since which time she has not been heard from.

The tumors weighed five pounds, two and one-half ounces. They were examined microscopically at the United States Army Medical Museum, and found to be malignant.

Carcinoma of right mamma.

CASE 4.

Mrs. M. K——; aged forty-three; admitted March 13, 1867; Irish by birth; temperament nervo-bilious; mother of eight children; has had no miscarriages; has nursed all her children, and enjoyed good health until within the last two or three months. Her mother is living, in perfect health, and, as far as she knows, there has been no member of the family afflicted with malignant disease.

She complains of pain in the mamma and under the right shoulder. A small tumor was first discovered in the breast about three years ago. In a few months several others made their appearance, having gradually increased in size, but caused no pain until recently.

Examination.—The entire gland had degenerated into a mass of intensely hard nodules; it was not adherent to the deep tissues, nor was the skin implicated or nipple retracted; the axillary glands were not enlarged. It appeared one of the most favorable cases for complete extirpation that had been admitted into the hospital.

March 15.—Patient was ætherized, the clinical class present. The gland, with every portion of suspected tissue, was removed; one large vessel had to be ligated, torsion failing to arrest the hæmorrhage. The ligature was applied in the following manner: A needle threaded with a piece of stout silk was passed through the skin, carried round the artery and out again near the point of entrance, thus including the vessel in a loop; the two ends were then tied on the outside over a piece of lint rolled up into a little compress the size of a quill. The flaps were adjusted with silver-wire sutures, and compresses applied as in the previous cases.

March 19.—Dressings removed, and the ligature cut and withdrawn.

March 23.—Sutures removed and union found to be perfect; a light compress and adhesive strips were applied and retained for about ten days, when the patient was discharged.

May 16.—Patient re-admitted. The skin covering the part from which the gland had been removed, was filled with hard nodules, two cancerous masses were sprouting from the cicatrix, and the axillary glands were enlarged. The patient was troubled with a severe cough, was very restless, pulse rapid, and skin hot.

She grew rapidly worse, and died May 28.

Sectio cadaveris. Thorax.—The cavity of the pleura contained on the left side about seven ounces of sero-purulent matter, some old adhesions remained in the upper part. Lungs, on both sides, studded with cancerous deposit; heart, healthy. *Abdomen.*—Liver normal in size, color, and consistency. Left kidney atrophied, but containing no evidence of cancerous disease. Peritoneum covered with small hard masses which were believed to be cancerous in character, but, through carelessness, the piece removed was lost, and, therefore, not submitted to a microscopical examination. Uterus and appendages healthy.

Commentary.—The gland was removed before there was any breaking down of the abnormal growth; there was no reason to suspect a general contamination of the system; indeed, considerable doubt existed, at the time of the operation, whether it was not a case of fibroid glandular degeneration, non-malignant. There was no family history to point to any supposed hereditary taint, and yet in a woman of previous perfect health we have a rapidly fatal, acute, malignant disease developed all over the system in a few months. Is not the supposition irresistibly strong that some of the cells (epithelial or white blood-corpuscles) so rapidly developed in the gland escaped into the lymphatic vessels with which the mammæ are so rich, and were thus conveyed to the different portions of the body, where their growth and proliferation gave rise to just so many new centers of disease.

Carcinoma of both breasts and cancerous tumor of the sternum successfully removed.

CASE 5.

In the latter part of July, 1868, I was requested by Dr. J. A. Ritchie to see a patient of his, Sister ——, one of the nuns of the Convent of the Visitation, Georgetown, who was suffering from extensive carcinomatous disease.

Upon examination, I found the left breast enlarged, hard, and nodular, adherent to the deep tissues, nipple retracted, axillary glands enlarged. It was the seat of sharp, lancinating pains, which passed into the shoulder and down the inside of the arm.

The upper portion of the sternum was occupied by a tumor, hard, irregular, and strongly adherent, but not painful, except when disturbed.

The right mamma had lost its characteristic shape, and was a mere mass of degenerating cancerous tissue, the skin mottled and adherent to the tumor in every part; the portion below the nipple had ulcerated, the axillary glands were enlarged, and the whole of the diseased mass was the seat of constant and severe pain.

From the physiognomy of the patient no suspicion would have arisen that she was a victim of malignant disease. While her expression was careworn and anxious, there was an entire absence of the usual cancerous complexion. This, indeed, presented the only favorable symptom in her case.

A more unfavorable subject for operative interference could not well be selected. According to the recognized authorities, the patient was past surgical aid.

If anything could be gained by an operation, it must be radical, the synchronous removal of both breasts and the sternal tumor. Risk of death from the shock of so extensive an operation was imminent. Escaping that, there would be great danger of exhaustive suppuration, and, should the patient recover fully from the operation, a return of the disease within a few months seemed more than probable. All that could be said in its favor was the bare possibility that she might form an exception to the rule, and the disease remain in abeyance for some years. It was also certain that without prompt surgical interference death under its most horrible and agonizing form would inevitably occur within a few months at farthest.

It was decided to state the case fairly to the patient, to tell her frankly all that was to be feared and the little that could be hoped for from an operation; and, without advising, let her form her own decision, after consultation with her friends. She very promptly decided to take the chances offered by an operation, which was performed on August 4, 1868, Doctors J. A. and L. W. Ritchie and F. A. Ashford assisting. Patient was fully ætherized, a full dose of whisky having been administered fifteen minutes previously.

The left breast and axillary glands were extirpated first; the arteries were controlled by torsion with one exception; the ligature in that case was brought out through the skin at the point of ligation.

The sternal tumor was next removed. The hæmorrhage proved troublesome, but no ligatures were used.

The pulse and respirations continuing regular, and little blood having been lost, it was decided to proceed, and remove the right breast and axillary glands.

The whole mass was adherent to the ribs; all that portion of the pectoral muscles beneath the gland was involved in the disease, and removed with the breast. The wound made by the operation was elliptical, nine inches long and seven inches wide at the broadest part of the ellipse. This large surface had to be left to heal by granulation.

The æther was now discontinued, the patient having been under its influence twenty-three minutes. When re-action became fully established the flaps of the left side and central wound were brought together by silver sutures. On the right side the surface was dressed with charpie soaked in glycerine and carbolic acid, five grains of the latter to the ounce of glycerine, and strong traction made above and below by strips of adhesive plaster.

Dr. Ritchie, being the attending physician, took the general charge of the case from this time onward. The parts were dressed every morning with the carbolized glycerine, until the eighth day, when the sutures from the left breast and sternum were removed, every portion having united by first intention; healthy granulations were springing up in every part of the wound on the right side. The following ointment was substituted for the glycerine as a dressing:

℞ Ungt. hyd. oxidi rubri, ℥ ss.
Ungt. simplicis, ℥ ss.
Pulv. myrrhæ, gr. x.
Acidi carbolici, gr. v.
M.

Tonics and stimulants were pushed to the point of toleration.

The patient steadily progressed toward complete recovery; the cavity of the open wound was soon filled up to the level of the surrounding tissue, and cicatrization rapidly followed.

More than four years have elapsed since the operation was performed; there is no evidence of any return of the disease in the parts from which it was removed, or in any other part. Dr. Ritchie assures me, and the patient confirms the assertion, that she is in better health at the present time than at any previous period during the last twelve years. She is bright, cheerful, enjoys life, and is actively engaged in teaching in the academy attached to the order, and has a fair prospect of continuing her life of usefulness for many years.

The diagnosis of malignant disease was fully confirmed by a microscopical examination made at the Army Medical Museum by Dr. Woodward.

I do not wish to be understood as claiming this case to be cured, but I do claim to have given the patient years of life and fair health, with a reasonable prospect of continuance.

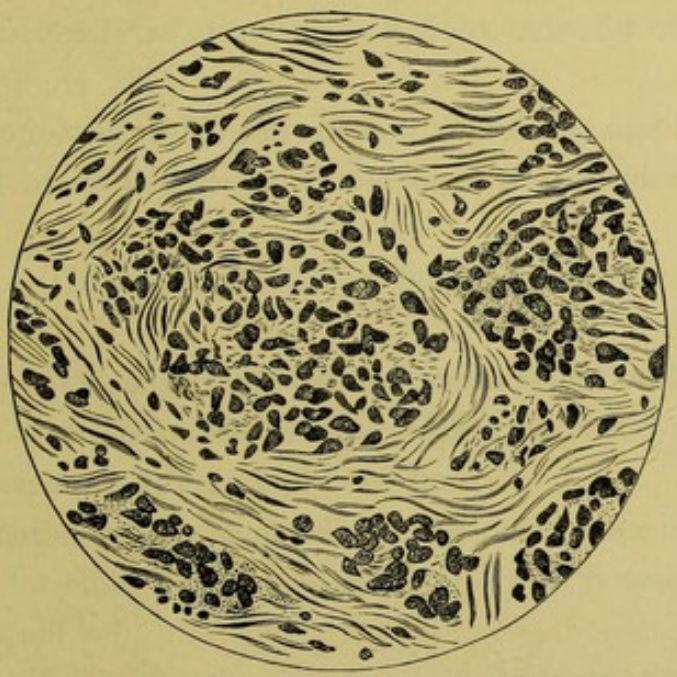
It is too commonly the custom to deny the victims of this loathsome disease the possible benefit of surgical interference, upon the plea that the disease will surely return, and that an operation may hasten the final issue. This, although probable, is not certain, and the records of the hospital of which I have charge are sufficiently encouraging to warrant a different course of practice.

The above case does not properly belong to the hospital report, but it is inserted on account of its peculiar interest, affording, as it does, the strongest possible argument for surgical interference even in the most desperate cases.

Encephaloid degeneration of an adenoid tumor of the left mamma.

CASE 6.

Mrs. M. T——; aged thirty-nine; admitted July 3, 1867; temperament sanguineo-bilious; mother of one child; has had three miscarriages; was unable to nurse her baby on account of sore nipples. She complains of sharp paroxysmal pains in the left breast, increasing in frequency and severity for two months prior to admission.



Microscopical appearance of tumor removed from the sternum, (case 5, page 170.) Photographed on wood from a section prepared at the United States Army Medical Museum.

Her breasts were large and fleshy, and in the left one, about one inch above the nipple, careful examination discovered a small lump which was painful upon pressure. It was difficult to distinguish it from the mammary tissue, its exaggerated consistence being hardly sufficient to mark its outline, but the tissue around it appeared less supple than the remaining part of the gland, or the corresponding part on the sound side.

There was nothing sufficiently well marked about the case to make a satisfactory diagnosis. It might be a slight innocent hypertrophy; simple inflammatory induration; or scirrhus in its early stage of development, the shooting, lancinating pain making the latter the more probable. It was decided to await further development, and the patient was requested to report herself occasionally as an out-door patient, more for observation than treatment.

The tumor increased rapidly in size and hardness, and but little doubt being entertained of its malignant character, it was decided that it should be removed.

September 14.—The entire gland was removed and the usual dressings applied.

September 18.—Dressings removed and union found perfect.

The sutures were removed on the eighth day and adhesive strips applied for support; no ligatures had been used.

Upon examination of the tumor under the microscope it was found to be what Velpeau describes as an "adenoid tumor with bosses of encephaloid matter."

This woman left the city shortly after her discharge from the hospital, but her daughter, who is a resident here, informs me that her mother has had no return of the disease.

Scirrhus of left mamma.

CASE 7.

M. K——; aged forty-nine; admitted October 23, 1867; spinster; American; of sanguineo-nervous temperament; complains of pain in left breast, extending up to the shoulder and down the arm. She has never enjoyed good health, always suffering from dyspepsia, which she ascribes to want of exercise, being a dressmaker.

The left breast was the seat of a hard tumor as large as a hen's egg,

adherent to the skin, which was discolored, being of a purple hue, nipple not retracted.

Upon consultation with Dr. Ritchie, her attending physician, it was decided to remove the entire gland, and the operation was performed October 26. The wound closed by first intention; not a drop of pus forming in any part.

November 19.—Patient discharged.

The tumor was examined at the United States Army Medical Museum and found to be scirrhous.

This woman has remained under Dr. Ritchie's charge ever since, and he informs me that there had been no return of the disease up to June 30, 1872, nearly five years since the operation for removal.

Scirrhus of left mamma.

Case 8.

Mrs. R. J——; aged forty-one; admitted March 8, 1868; American by birth, but of German parentage; temperament bilio-lymphatic; mother of eight children, all of whom she nursed; has had two miscarriages. Her general health has been poor for the last three or four years.

The left breast was larger than the right, the entire gland being in a state of cancerous degeneration, and the axillary glands enlarged also.

March 15.—An attempt was made to ætherize the patient, but it was found impossible on account of the irritation produced by the æther on the mucous membrane of the bronchi, and chloroform had to be employed to produce anæsthesia. A straight incision was made from the axilla to the breast, terminating in an ellipse which included the nipple. The removal of the tumor was quickly effected, but the dissection of the glands from the axilla was tedious. Just as the last hardened mass of these was removed and the arm brought down to the side of the patient, she stopped breathing. Her mouth was forced open, the tongue seized and drawn forward, and artificial respiration resorted to, which was continued for twenty-two minutes before a natural breath was drawn by the patient.

When she had fully recovered, the flaps were adjusted and the wound dressed as in the previous cases.

The sutures were removed on the eighth day and union found perfect in every part. Discharged May 7.

There had been no return of the disease in this patient up to April, 1871, since which time she has not been seen.

The microscopical examination of the tumor verified the diagnosis.

Carcinoma of mamma and Extra-capsular Fracture of femur.

M. M.——; aged forty-one; admitted August 18, 1867; mother of three children; has had no miscarriages; always been healthy; has never had occasion to employ a physician in her life, having been attended by a woman in her labors, which she describes as periods of rest for a few days. She was brought to the Institution on account of an accident. In stepping on to a car she twisted her foot, and found herself unable to stand. Upon examination it was discovered that the neck of the femur had been fractured, (extra-capsular.)

When the nurse undressed the patient previous to placing her on a fracture-bed, it was observed that she had carcinoma of the left mamma far advanced in the ulcerative stage, with enlarged axillary glands. The ulceration, which was deep, measured two and one-quarter inches by two and seven-eighths.

Her general condition was decidedly good.

The existence of the cancerous disease made the prospect of union of the fractured bone very doubtful, but, upon consultation with Dr. J. K. Barnes, the Surgeon-General, it was determined to treat the case as if no cancerous disease of the breast existed.

The patient was placed under æther, and the fracture adjusted, a modification of De Sault's splint having been applied. This had shortly to be removed on account of the ulceration produced by the perineal belt. In its place sand-bags were laid on each side of the limb, and extension made by adhesive strips and a four-pound weight. Contrary to all expectations, perfect union was obtained, and by the middle of December she was able to move about the ward moderately well, assisted by crutches.

The amputation of the breast was not considered advisable, but it was deemed a good case for a trial of the virtues of bromine.

September 5.—Bromine (pure) was applied to every portion of the ulceration, and the ulcer dressed twice daily with a solution of bromine, one part bromine to twenty of alcohol. Under this treatment the enlargement of the glands disappeared, the ulcer lost its characteristic appearance

and diminished in size, healthy granulations sprang up, and everything looked promising. The patient suffered no special pain, but complained of soreness only; her appetite appeared good, and digestion and assimilation perfect.

She was sufficiently recovered at Christmas to be discharged and treated as an out-door patient. Of the ultimate fate of this woman I am unacquainted, she having left the city some months after her discharge from the hospital.

Twenty-four operations have taken place in this hospital for cancer of the breast. One by Dr. Thomas Miller of this city, one by my assistant, Dr. F. A. Ashford, and twenty-two by myself.

Twenty-three fully recovered from the operation, and one died from surgical fever on the fourth day.

In twenty-two of the cases, perfect union was established between the fourth and sixth days, not a drop of pus having been formed in any part of the wounds.

In two cases, there was secondary hæmorrhage, which necessitated the opening of the wound to secure the bleeding vessels.

In seven cases, there had been no return of the disease for a number of years.

In two, it returned within four months, and in seven, within one year from the date of the primary operation.

The result in the remaining nine cases cannot be given, as the patients were not heard from after they left the hospital.

It will be observed that, with two exceptions, we have succeeded in obtaining union by first intention in all the cases of mammary cancer operated upon in this institution. This result was chiefly owing to the care exercised in the after-treatment, especially in the arrangement of the compresses, which were so adjusted that every part was kept in apposition, but no portion submitted to undue pressure.

The general result has been extremely gratifying, and affords the strongest possible argument in favor of extirpation by the knife.

No question can be raised as to the nature of the tumors removed, for every one of them was submitted to a microscopical examination, and found to possess the anatomical arrangement peculiar to malignant growths. The theoretical reasonings adduced by the antagonists of the operation will have

no weight when tested by actual experience. It is quite true that some surgeons have been peculiarly unfortunate, and their reports are well calculated to discourage operative interference; according to them the disease will always return after removal, and the operation only accelerates its progress and fatal termination.

This was the opinion of Boyer, who, out of one hundred operations, could enumerate but four in which there was no return of the disease.

Scarpa states that he has met with but three cases of success.

MacFarlane, out of one hundred and eighteen cases, could not point to a single case in which there was no return.

Mayo had ninety-five returns out of one hundred cases.

I cannot but believe that these statements were made up from imperfect information and not from careful observation.

In Europe, when a patient finds herself afflicted with a tumor, she first consults a surgeon, and does not apply to a physician until a later period. Those who have been operated upon and cured have no occasion to go to physicians at all, but those in whom the disease returns end by seeking advice from everybody. If a physician only sees those who have been the subjects of unsuccessful operation, or in whom the disease has advanced to a stage where an operation is performed only as a palliative measure, he may easily be led to the conclusion that an operation is useless.

Surgeons are naturally called upon to examine tumors of the breast in all possible conditions. They see them at the commencement, and are able to follow them to their termination, and they alone possess the necessary data for the solution of this problem. If they possess an equal amount of talent, judgment, experience, and good faith as physicians, they must be better able to decide whether the operation of extirpation of the breast for cancer holds out any hope of effecting a cure.

In seven of the twenty-two cases operated upon by myself, there has been no return of the disease, so far as could be ascertained, up to the time of writing this report. One survived the operation five years and six months, two five years, one four years and six months, one three years and seven months, and two over three years. Three of these cases were extremely unfavorable subjects, and the operation was performed as a palliative measure only, not with any idea of effecting a cure. No report has been made of

cases operated upon within two years in which the disease has not returned. Of these there are eight in my private practice alone.

Neither of the above cases may be cured, but that does not militate against the operation. In all probability not one of them would have been living to-day if the disease had been allowed to run its course uninterruptedly. If it should return in either of them, and the patient's strength will admit, I shall remove the secondary growth, for which procedure there is abundance of warrant.

Dr. Arnott reports a remarkable case which occurred in his own practice: Sarah Hillier; aged forty-seven; a married woman; the mother of four children; healthy and of spare habit; applied to him in December, 1846, for the removal of a tumor which had been perceived in her left breast four weeks previously. Her attention had been called to the part by a sensation like the sting of a flea, and influenced by the example of what had befallen other members of her family who had suffered from cancer, she determined to have the swelling taken away with as little delay as possible. He acceded to her request and removed the whole mamma. The tumor was about the size of the last joint of the thumb, and situated around the nipple, which, however, was not in the least retracted. She left the hospital in less than three weeks, with the wound cicatrized. The mass which had been removed was an example of genuine scirrhus. In 1850 she was seen again, when the cicatrix was found to be perfect and the axillary glands were in healthy condition. In April, 1856, nearly ten years after the primary operation, she once more consulted Dr. Arnott, having a return of the disease in the cicatrix, and some swelling of the axillary glands. She had only discovered this three months before, having in the interval between the previous operation and the present time enjoyed perfectly good health. At the axillary border of the cicatrix was a hard tumor, of about the size of a small pigeon's egg, adherent to the integument. In the axilla and above the clavicle, were some enlarged, but not indurated glands, having no apparent communication with the tumor.

On the 3d of April, this lump, together with four axillary glands, was extirpated by M. Shaw, who took charge of the patient, and both to the naked eye and under the microscope the whole was found to be made up of well-marked, somewhat soft scirrhus.

The mother of this patient died of open ulcerated cancer of the breast,

which had not been operated upon, and out of a family of six sisters, only one had escaped the disease.

Previous to 1846, when the disease commenced in this patient, she had lost her mother and two sisters from cancer, for which they had undergone no operation; another sister had been operated upon for similar disease in 1844, and remained well until 1855, a period of eleven years, when she had to submit to a fresh operation, but continued well after the second.

Thus the disease was kept in abeyance in two of the sisters for a period respectively of ten and eleven years by the primary operation, and how long by the secondary is uncertain.

Velpeau reports a number of cases where he removed cancerous tumors from the breast a second and even a third time, several years intervening between the return of the disease, but no return taking place after the last removal.

DISEASES OF THE VAGINA AND CERVIX UTERI.

To understand fully the importance of prompt and efficient treatment in acute or chronic inflammatory diseases of the cervix uteri and vagina, it is necessary that we shall be thoroughly acquainted with the minute anatomy of the parts. Tyler Smith has given the best description of their anatomy extant; it is concise and comprehensive, and for convenience of reference in cases reported I make the following extract:

"*The os uteri and the external or vaginal portion of the os and cervix uteri.*

"Like the mucous membrane in other parts of the body, the mucous covering of the os and cervix uteri consists of 1, epithelium; 2, primary or basement membrane; and 3, fibrous tissue, blood-vessels and nerves. There are, however, numerous points of special character belonging to the mucous membrane in this situation; and for convenience of description the mucous membrane of the os and cervix uteri may be divided into two tracts, one comprising the surface of the os uteri and external portion of the cervix, the other being the mucous lining of the canal or cavity of the cervix. In the first place I proceed to describe the mucous membrane of the os uteri and external portion of the cervix, or that which lies between the junction of the cervix with the vagina, and the margin at which the mucous membrane of the os uteri becomes continuous with the mucous lining of the canal of the cervix.

"The layer of epithelium found in this situation is tesselated or squamous, and is so arranged as to form a membrane of considerable thickness. On the free surface it is comparatively smooth, but its attached surface is rough and excavated from the projection of the villi or papillæ into the epithelial layer. After maceration in water for a few days, or when incipient decomposition has taken place, it can readily be detached from the papillæ, and raised from the surface of the mucous membrane. It closely resembles the epithelial covering of the vagina, with which it is continuous. See Fig. 1, plate 12.

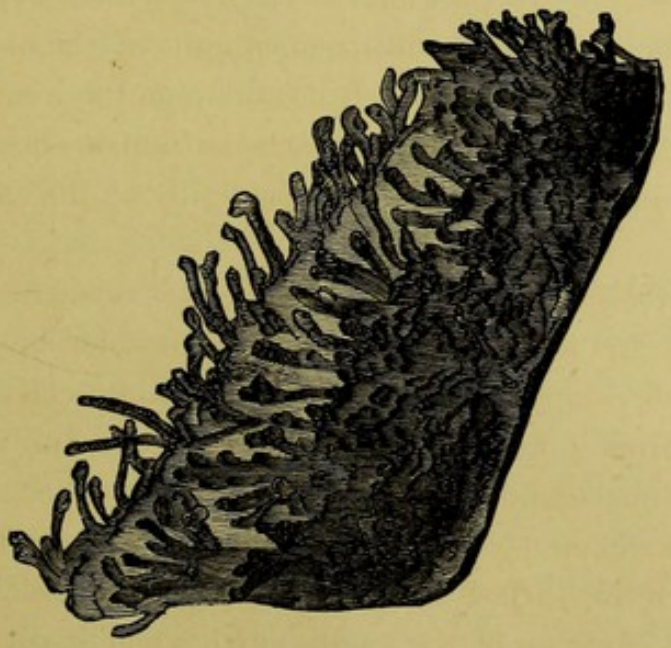
"Immediately beneath the layer of epithelium the basement membrane is found, covering numerous villi or papillæ, which stud the whole surface of the mucous membrane. These villi are sufficiently large in some specimens

Fig. 1.



Pavement epithelium covering the os uteri, 240 diameters.

Fig. 2.



Papillæ or villi of the os and cervix uteri, 23 diameters.



to be seen by the naked eye, when a thin section is held up to the light. The villi of the os uteri are generally single, but occasionally two or three villi are united together upon a single pedicle. When the villi are partially or entirely denuded of their epithelial and sub-epithelial coverings by maceration, or decomposition after death, or in certain diseased conditions, an uneven appearance is given to the os uteri. The extremities of the villi, from which the covering of scaly epithelium has been removed by maceration, present a very characteristic appearance when seen by a low power They form an irregular fringe standing out from the surface upon which they are placed. See Fig. 2, plate 12.

"Much information as to the nature of these villi may be gained by examining them with different powers of the microscope. When a thin portion is sliced from the surface of the os uteri, and examined with a higher power than that used in the preceding examination, the points of the villi appear nipple-shaped, and the whole surface is studded with wavy eminences formed by the villi. Around the bases of the projections, and immediately upon them, the epithelial scales are more numerous and crowded than in the interspaces. The shape of the scales in the crowded parts becomes narrower and more acutely pointed. In the center of the point of each villus a depression is seen, suggesting the probability that the extremities of the villi may be more specially engaged than the other parts in the production of the mucus of the os uteri and the vaginal portion of the cervix. This arrangement of the villi and their epithelial envelope considerably increases the extent of the epithelial surface.

"The surface of the os uteri is generally described by authors as containing numerous mucous follicles. A variety of diseases are referred to morbid changes in these follicles, and they have been made to play an important part in the pathology of leucorrhœa by many authors; but under the microscope, it is difficult to make out any distinct follicular structure. On looking with a low power at a section taken from the os uteri, an appearance very similar to that presented by mucous follicles is observed; but on a closer examination it is found that the dark spots, which appear like mucous crypts, are really elevations with central depressions. See Fig. 1, plate 13. Some of the dark spots will be seen to contain red points, which are terminations of the blood-vessels of the villi. In other parts of the same specimen, the blood-vessels can often be seen with great distinctness. The

appearances which might be mistaken for mucous follicles seem, in fact, to be nothing else than the villi, more or less obscured by their epithelial covering. In examining different parts of the same specimen, we may detect that what appear at first to be depressions are evidently slight elevations; and that the points which seemed to be the site of follicles are really the terminations of villi.

"Another source of error has arisen from the occasional presence of Nabothean ovules, as they are termed, in the situation of the villi. The villi have been mistaken for mucous crypts, and the ovula Nabothi have been supposed to be the same crypts obstructed and distended with mucus.

"When a few of the villi are examined by a high power, in a recent specimen, each villus is found to contain a looped blood-vessel, which may be seen passing to the end of the villus, and returning to its base, where it inosculates with the blood-vessels of the neighboring villi. These villi are everywhere covered by a thick layer of pavement epithelium, which also fills up the intervals between them, rendering the external surface comparatively smooth, as seen by the naked eye. In Fig. 2 plate 13. the outlines of several villi, the vascular loops of the villi, and the layer of epithelium covering the villi, are represented.

"The thick layer of epithelium, and the villi with their looped vessels, appear to be the principal anatomical features of the mucous membrane of the os uteri and external portion of the cervix; and it will be seen in the sequel that both villi and epithelium play an important part in the pathological changes which occur in the lower segment of the uterus.

"*Villi of the lower part of the canal of the cervix uteri.*

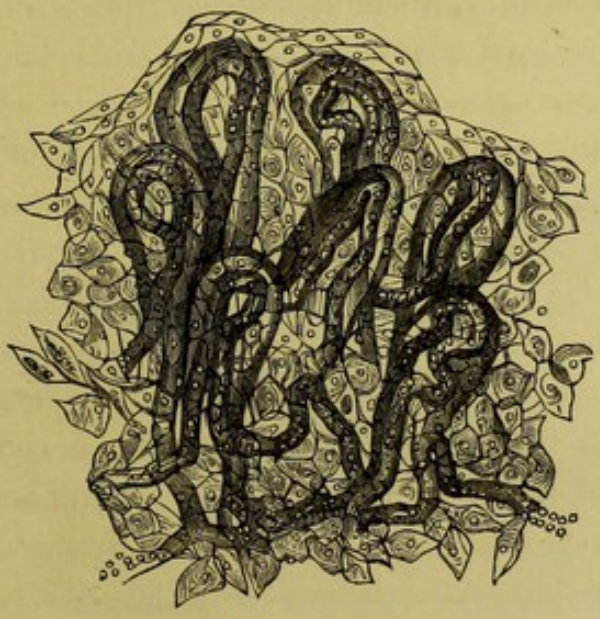
"On passing within the os uteri, to examine the mucous membrane lining the cervical canal, a small tract of smooth surface is generally found between the margin of the lips of the os uteri and the commencement of the penniform rugæ. Sometimes, however, there is only a slight rim between the os uteri and the lower rugæ; and occasionally the rugæ extend so low down that they may be seen at the os uteri itself. When the smooth surface now spoken of exists, as it does in most specimens to some extent, the mucous membrane appears to the naked eye more delicate and vascular than the mucous membrane of the external portion of the os uteri. But whether rugose or smooth, the mucous membrane of this portion of the cervix con-

Fig. 1.

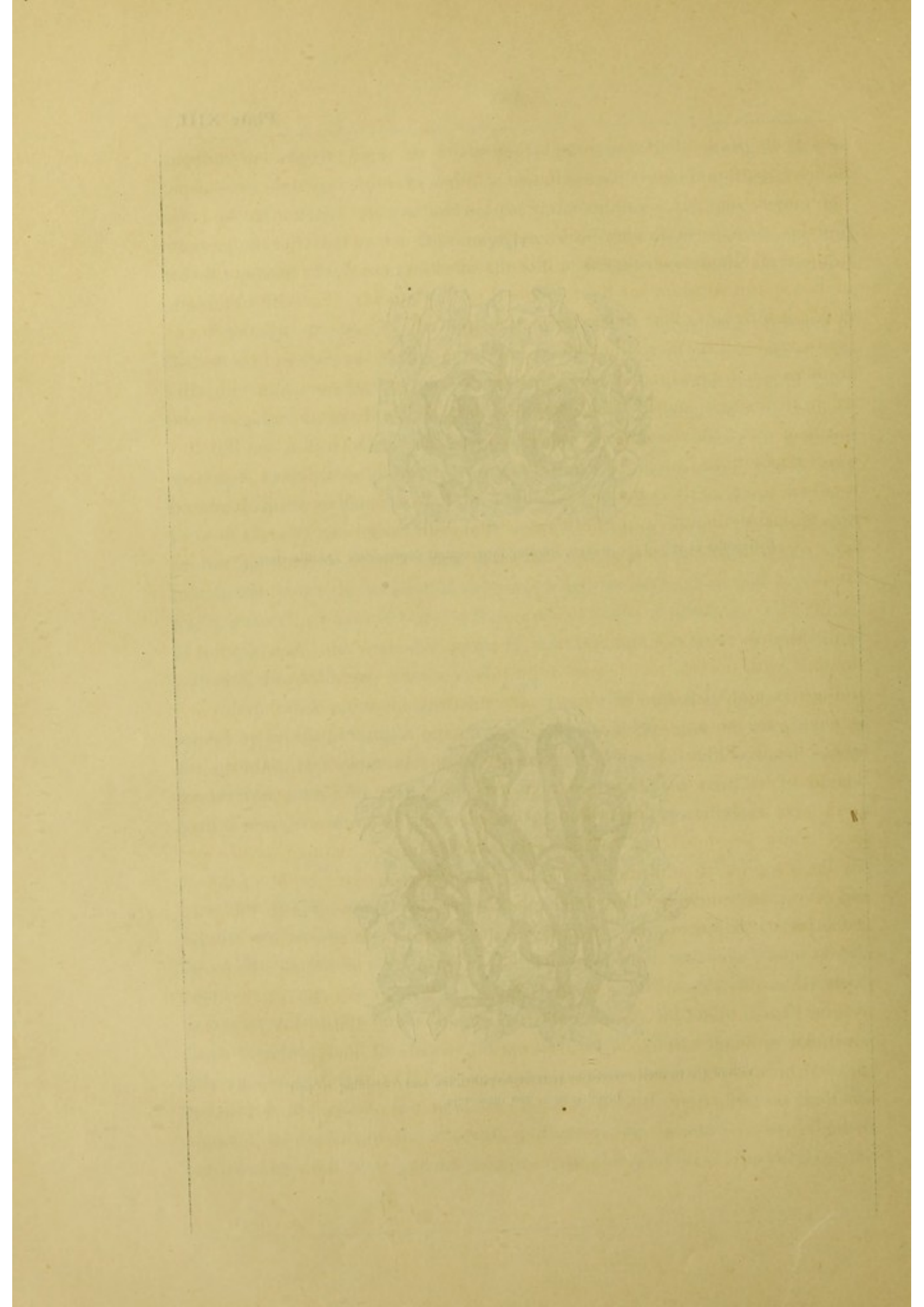


Extremities of villi of the os uteri, showing their central depressions, 220 diameters.

Fig. 2.



Villi of the os uteri covered by pavement epithelium, and containing looped blood-vessels, 220 diameters.



sists of the same elements, except that wherever rugæ are present mucous follicles are found in great abundance. When examined by the microscope, the mucous membrane immediately within the os uteri is found to be composed of cylinder epithelium arranged upon villi, somewhat after the manner of the epithelium covering the villi of the intestinal canal, of basement membrane, and of sub-mucous tissue. See Fig. 1, plate 14. The villi in this situation are three or four times larger than the villi of the external portion of the os uteri. Like the villi of the os uteri, the villi of the canal of the cervix are occasionally compound, consisting of two or three or even four villi arising from a single stalk. They contain looped blood-vessels, and, in some specimens, two or three of the vascular loops may be seen in a single villus where the villi are of large size. They are covered, as well as the spaces between them, with cylinder epithelium, dentated in shape, and arranged with great regularity. At the bases of the villi, their blood-vessels inosculate freely, as in the case of the villi upon the external surface of the os uteri.

* * * * * * * *

"M. Jobert was of opinion that the upper part of the cervix uteri is supplied with nerves, which pass from thence to the vagina, leaving the os and cervix uteri destitute of nerves. In this way he explained the absence of pain upon the application of escharotics and the actual cautery to the os uteri. Dr. F. Kilian doubted the correctness of this view of M. Jobert, and this doubt led him to the examination of the structure of the os and cervix uteri. Dr. F. Kilian assumed that, as papillæ are the organs of sensibility, there must be sensibility and consequently nervous filaments wherever papillæ are present; and finding papillæ in the mucous membrane of the os and cervix, he concluded that there must be nerves of sensation in this part of the body. He could not, however, demonstrate their presence with the microscope. The fact that the os uteri is, in ordinary conditions, comparatively insensible to pain, he met by supposing that its nerves are fitted to receive pleasurable sensations, and that the nerves of the cervix uteri are not under ordinary circumstances susceptible of painful impressions.

"It becomes a question of much interest to decide what are really the functions performed by the villi of the vagina and the os and cervix uteri. In the lower part of the vagina, the papillæ are no doubt sensitive in function, and deserve the term applied to them by Dr. F. Kilian; but in the

upper part of the vagina, the mucous surface is, in the healthy condition, possessed of little sensibility either to pleasure or pain; yet the papillæ or villi are very abundant. The villi are present in very great abundance upon the os uteri and the external portion of the cervix, though the os uteri is, in the majority of cases, insensible to the touch. It is only when the os or cervix uteri is distended by instruments, or when the cervical canal is inflamed or constricted, that pain is caused in ordinary cases. The villi are largest and more highly developed within the os uteri, where sensation is more blunted than in any part of the vagina or on the os uteri. For these reasons, I am inclined to believe that the villi of the os and cervix uteri, particularly the villi of the cervical canal, are little concerned in sensation. From the liberal supply of blood possessed by the villi, I suspect they are concerned in the secretion of the fluid plasma which the external portion of the os and cervix and the upper part of the vagina pour out, and which forms the vehicle in which the epithelial *débris* is suspended; or they may be intended for the formation of the thick layer of epithelium covering these parts, and which is in constant process of renewal and disintegration. * * The papillæ of the os and cervix may be almost entirely vascular. But the probabilities are that some of them are vascular, others sensitive, like the papillæ of the skin, in which some contain vascular loops and no nerve-tubes, others contain nerve-tubes but no vascular loops. The practical results are, however, little affected by these questions. The os and cervix uteri are undoubtedly covered by epithelium, which may be abraded, and it undoubtedly contains papillæ or villi, which, when denuded or hypertrophied, may present all the appearances of granulations, and have probably been mistaken for them. The large vascular loops contained in the villi of the os uteri, and particularly of the lower part of the canal of the cervix, also afford the explanation of the sanguineous discharges from the os and cervix uteri, so frequently met with in cases of leucorrhœa.

"Underneath the villi, both in the lower part of the cervical canal and upon the external surface of the os and cervix uteri, a dense fibrous and vascular tissue is found, mixed with nerve-fibres and involuntary muscular fibres and nuclei, the muscular fibres becoming more plentiful on descending deeply into the structure of the walls of the cervix. In the villi themselves are numerous oil-globules, many of them of large size, as well as an abun-

dance of granular cells; these elements are situated between the looped blood-vessels and the basement membrane.

"THE GLANDULAR STRUCTURES OF THE CANAL OF THE CERVIX UTERI.

"The descriptions hitherto given of the canal of the cervix uteri, in anatomical works, have been very meager and insufficient; certainly not at all commensurate with its importance both in a physiological and pathological point of view. Obstetricians have rivaled systematic anatomists in the brevity with which they have dismissed this subject. In recent times, the os uteri and the external portion of the cervix have so far eclipsed the cervical canal in importance that the latter is scarcely referred to by writers on leucorrhœa.

"One of the best accounts with which I am acquainted in any English work is contained in the last edition of Dr. Quain's 'Elements of Anatomy.' I quote from this description the passage relating to the glandular structure of the cervix:

"'That portion of the (uterine) cavity which corresponds to the neck resembles a tube slightly flattened before and behind; it is somewhat dilated in the middle, and opens inferiorly into the vagina by the os tincæ. Its inner surface is marked by two longitudinal ridges or columns, which run, one on the anterior, the other on the posterior wall, and from both of which rugæ are directed obliquely upward on each side, so as to present an appearance which has been named *arbor vitæ uterinus*, also *palmæ plicatæ*.

"'The mucous membrane which lines the uterus is thin, and closely adherent to the subjacent substance, especially in the body of the organ. It is continued from the vagina into the Fallopian tubes. Between the rugæ of the cervix, already described, it is provided with numerous mucous follicles and glands.'

"This, it must be confessed, is very brief; but, although the subject is treated of in almost every systematic treatise on midwifery, it is seldom that any further description is met with. No obstetrician has, so far as I am aware, described the cavity of the cervix more minutely than Professor Paul Dubois, in the first volume of the great work he is still engaged upon, *Traité de l'Art des Accouchements*, the first part of which was published a few years ago. His description is as follows:

"'The cavity of the cervix represents a small elongated canal, flattened and fusiform, dilated toward its center, and becoming narrower at the extremities. Its two walls, one of which is anterior and the other posterior, present each, at the median line, a longitudinal eminence or crest, which appears to be the continuation of the less marked ridges existing in the walls of the cavity of the fundus. From each of these crests, numerous folds are given off laterally; these are thick, regularly arranged one above another, and less united at the center than at the extremities. They take a somewhat oblique direction upward and outward, toward the lateral walls of the canal, where they terminate at another vertical but less apparent line. Thus arranged, these folds seem to be formed between the two vertical crests, like oblique steps of a ladder, and are a little concave above. The meeting of these branches, which somewhat resemble a fern-leaf, has been termed the *arbor vitæ*.

"'Between these folds rather deep grooves are seen, which are occupied by a greater number of mucous follicles. The excreting orifices of these glands are frequently obliterated by accidental causes, and the mucus accumulating in their cavities, they acquire a remarkable development. In this state they were taken, by an ancient anatomist, Naboth, for human ovules; and even at the present day, though their real structure is well known, they are still frequently designated as the ovules of Naboth.'"

" Sir Charles Clarke, whose work on the 'Diseases of Females' has never been excelled, described the cervix uteri in three or four sentences. He entertained a correct idea of the structure and functions of this part of the body, though he was far from seeing its importance in the pathology of leucorrhœal disorders. He states:

"'The cervix of the uterus is beset with a number of glands. These glands are more readily discernible in women who have died pregnant; and in some bodies they are probably much more numerous than in others. * * * * * * * The cervix of the uterus is a glandular part; its secreting organization can be demonstrated. It is subject to the diseases of glands in other parts of the body, and in all probability will be particularly liable to take on disease in habits which are prone to other glandular complaints, namely, in weak habits. The majority of cases of disease in the breast, and in the testicle, arise in such persons.'"

In volumes xvii and xviii of the *Archives Générales de Médecine*, (fourth series,) M. Charles Robin has published an historical memoïr on the anatomy and pathology of the mucous membrane of the uterus, in which he gives a minute account of the mucous surface of the cervical canal and its mucous follicles. M. Robin states that mucous glands are present in the cervix, from the limit separating the cavity of the fundus from the cervix, down to the os tincæ. The orifices of these glands are said to be visible on the rugæ of the arbor vitæ, as well as in the grooves between them, but to be most numerous in the intervals between them. He observes that the microscope reveals many more than can be seen with the naked eye. The glands themselves are described, not as simple mucous follicles, but as small cylindrical tubes terminating in a round *cul-de-sac*, the tubes and their terminal *cul-de-sac* being compared in shape to a bottle or vial.

"*Rúgæ of the cervical canal.*—A careful examination of the canal of the cervix uteri itself, will, however, show that even the most careful of these descriptions are imperfect. When the cavity of the cervix belonging to a virgin uterus is laid open by a longitudinal incision, so as to expose the whole of the cervical canal, the internal surface is generally found to contain four columns of rugæ, or folds of mucous membrane, the rugæ being arranged in an oblique, curved, or transverse direction. Between these columns of rugæ four longitudinal grooves or ridges are usually seen. In some specimens, grooves, in others, ridges are present. Of these, the two grooves or ridges in the median line, anteriorly and posteriorly, are the most distinct. The other longitudinal markings are situated, one on each side, between the anterior and posterior walls of the cervix, beginning below at the angles dividing the anterior and posterior lips of the os uteri. The canal of the uterus is flattened in shape, and two of the rugous columns are arranged on the anterior surface, corresponding to the anterior lip, and the other two upon the posterior lip; the posterior half of the cervix being the largest of the two, and containing the greatest number of rugæ. The sulcus or division between the posterior rugous columns is also generally more strongly marked than the sulcus dividing the anterior rugous columns. The rugæ of each column, as seen by the eye alone, vary from about ten to fifteen in number. In the intervals between the columns numerous small longitudinal folds may be seen, but these are less distinct than the transverse rugæ. In the healthy state, the transverse rugæ, with the fossæ

between them, are covered with a viscid and transparent mucus; and when this is brushed away, a reticulated appearance, caused by numbers of secondary rugæ, is visible in the mucous membrane beneath. The secondary rugæ run in various directions, without much regularity. In some parts of the fossæ the mucous crypts are deeper than usual, and here and there minute openings are seen at the bottom of the pits, into which fine bristles may be passed to the distance of the twelfth of an inch or more. Besides the four rugous columns and the furrows between them, which are found in the well-developed cervix, other rugæ of irregular shape are seen, particularly at the upper and lower portions of the cervix, where the regular, transverse, or oblique rugæ become indistinct. The cervical rugæ have been compared to a tree, a feather, or a fern-leaf; but when the whole cervix belonging to the uterus which has never been impregnated is displayed, it is not unlike an open book in miniature, printed in double columns.

"Although the columnar arrangement now described is generally met with in the cervix uteri in women who have not borne children, specimens of virgin uteri are sometimes seen in which the cervix presents a cribriform appearance, instead of the arrangement of transverse rugæ, with fossæ between them; or there may be a less number of rugous columns than four, from the absence of some of the longitudinal sulci, or ridges. When the follicles are arranged in a cribriform manner, they enter more deeply into the structure of the cervix, and are collected together in pouches instead of furrows. I have seen one or two instances in which the follicular structure of the cervix extended down to the os uteri, and the rugæ, instead of being arranged transversely, were found in the form of radiating laminæ round the os uteri. In some specimens, the rugæ of the whole cervix are arranged closely together, as thin laminæ, with deep divisions between them.

"In the virgin state, the arrangements of the mucous membrane above described occur with tolerable regularity; but after pregnancy and childbearing, they become, to some extent, confused and irregular, though the follicular structure remains. The less regular disposition of the cervix in multiparous women is not to be wondered at, when we consider the changes which occur from the development of the cervix in pregnancy, and the great dilatation of this part of the uterus during the passage of the child in parturition. Probably it is owing to the great extent of the reduplication of the mucous membrane of the cervix that laceration of the mucous surface of the

cervix does not occur more frequently during labor. In pregnant women, or in cases where the cervix uteri is unusually developed, as in long-standing leucorrhœa, polypus, prolapsus, or procidentia, the rugæ or folds are considerably increased in size, or they are unfolded to a considerable extent. Probably all the rugæ of the cervix disappear during labor from the unfolding of the rugæ, just in the same way as the *columnæ rugarum* and the transverse rugæ of the vagina are obliterated from the same cause. In one case of polypus of the uterus which I examined after death, where the tumor was contained in the fundus uteri, but in which the cervix had shared in the increased growth of the organ, the rugæ and follicles of the cervix were increased in size. In another case, in which a large polypoid growth occupied the cervix uteri, the cervical canal was thinned out to a great extent, and the situation in which the rugæ are usually found was perfectly smooth, from the gradual unfolding of the mucous membrane. In the young child, the cervix uteri bears a greater proportion to the rest of the organ than in middle life, and the arbor vitæ is seen very distinctly. In old age the whole of the structures of the cervix and fundus uteri shrink to a great extent.

"The foregoing is a description of the mucous surface of the cervix uteri, such as it appears on a careful examination with the naked eye alone. In all anatomical works, mucous follicles and lacunæ are mentioned as being numerous in the canal of the cervix uteri and between the penniform rugæ; but the subject is, as I have already observed, generally dismissed in a few words, and I am not aware that any exact description of the cavity of the cervix uteri and the arrangements of the mucous membrane, as they may be seen even without the aid of a lens, has been hitherto given. Names too often hide the real significance of things, and the terms, *penniform rugæ*, *glandulæ Nabothi*, *palmæ plicatæ*, and *arbor vitæ uterinus*, would seem in this instance to have been received in lieu of more accurate descriptions.

"*Glandular follicles of the cervical canal.*—If the above be true of the cervix uteri as it may be examined by the naked eye, we have been still more ignorant of the anatomical arrangement of its mucous membrane as seen by the microscope. If we take a section of a virgin cervix uteri, containing one of the longitudinal columns only, and magnify it nine diameters, we obtain a clear insight into the glandular structure of the cervical canal. The transverse ridges now stand out with great prominence. Besides the primary rugæ, each fossa is seen to be subdivided by smaller

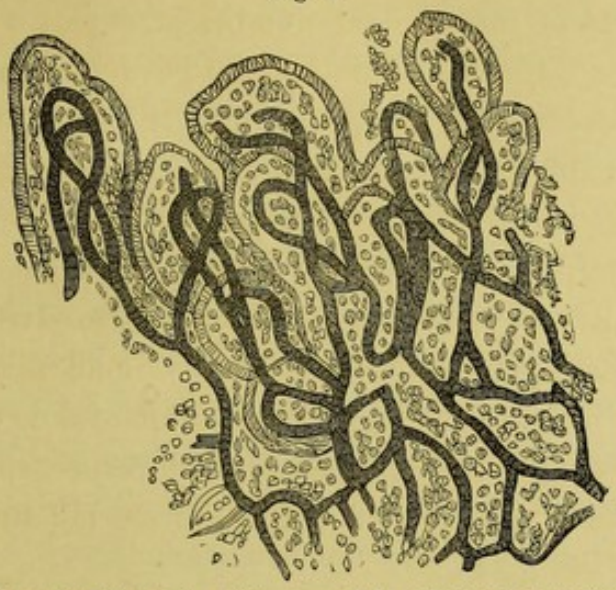
rugæ, from which curved septa, still more minute, take their origin, dividing the principal fossæ into a great number of crypts, arranged like a fine piece of net-work. In each of the fossæ between the primary rugæ, as many as from forty to fifty crypts or laminæ may be seen. A cervix of moderate size would show between the transverse rugæ of the four columns alone, with this low magnifying power, from two to three thousand follicular pits. But, besides the fossæ between the rugæ, the spaces between the rugous columns, and the longitudinal sulci themselves, are all seen to be covered by multitudes of mucous follicles. Small plicæ are everywhere visible, and these are evidently only a repetition of the columnar rugæ, on a lesser scale. This is particularly the case with respect to the larger extremities of the transverse rugæ, all of which are closely studded with mucous pits. See Fig. 2, plate 14.

"If a portion of the cervical mucous membrane be magnified still further to the extent of eighteen diameters, so as to take only two or three of the primary ridges and fossæ into the field, it will be seen that the rugæ themselves, and even the secondary septa, are covered in the greater part of their length with mucous follicles. The crypts in the furrows are still further divided and subdivided, so as to double or treble the number of follicles and laminæ seen with the lower power. In a portion of the cervix, comprising only three rugæ, and their two interspaces, upwards of five hundred mucous follicles were easily counted, so that it is within the limits of moderation to say that a well-developed virgin cervix uteri must contain at least ten thousand mucous follicles; indeed, even this number is probably greatly exceeded. See Fig. 1 plate 15.

"When a longitudinal section is made through the middle of one of the rugous columns, and viewed laterally, fossæ are found to extend obliquely and deeply into the substance of the cervix, sometimes to the extent of the sixth of an inch or more; and occasionally mucous openings pass into the center of the walls of the cervix, and may be seen filled with the tenacious mucus proper to the cervical canal. These irregular cavities are sometimes obstructed, and contain masses of inspissated mucus, the openings leading to the cervical mucous surface having become closed.

"Besides the anatomical arrangements already described, the superficial surface of this part of the mucous membrane of the cervical canal is further increased by the presence of villi similar to those found in the lower part of

Fig. 1.



Villi of canal of the cervix uteri, covered by cylindrical epithelium, and containing looped blood-vessels, 100 diameters.

Fig. 2.



One of the four longitudinal columns of rugæ from the virgin cervix, 9 diameters.

the cervix. The villi extend to the glandular surface of the canal, and are found in considerable numbers on the larger rugæ, and other parts of the mucous membrane in this situation. Thus the entire organization and disposal of the mucous membrane lining the canal of the cervix uteri are such as to afford a very large extent of glandular surface for the purposes of secretion. In effect, the cervix uteri is an open gland, and it performs, as will hereafter be shown, all the functions fulfilled by glands in other situations.

"Another purpose served by the reduplications of the mucous membrane of the cervix uteri I have already alluded to, namely, the dilatation of the cervix uteri during labor, without laceration. In pregnancy, the cervix uteri is enlarged and unfolded considerably by the processes of growth, and in this enlargement the rugæ take part; but nevertheless, at the time of parturition, a large amount of distension takes place during the passage of the fœtus. Without some such provision as that offered by the rugæ of the cervix, laceration of the mucous membrane would be a frequent occurrence. During pregnancy the rugæ are enlarged and loosened; but when the os uteri is fully dilated in labor, the mucous membrane of the cervix may be felt perfectly smooth, no doubt from the unfolding of the rugous mucous membrane. In this, as I have already said, the rugous arrangement of the mucous membrane of the cervix uteri may be compared to the rugous arrangement of the mucous membrane of the vagina.

"I may here refer to a point which should not be lost sight of, bearing, as it does, upon the pathology and treatment of the disorders of the os and cervix uteri, namely, the great similarity which exists between the skin and the mucous membrane of the vagina, and of the external portion of the os and cervix uteri. The resemblances of the mucous membrane in these situations are certainly much nearer to the cutaneous structures than to the mucous membranes of more internal parts. This is particularly the case with respect to the dense epithelial layer of the vagina and os uteri; and the villi of the os uteri are perhaps more nearly allied to the papillæ of the skin than to the villi of the intestinal mucous membrane. The surface of the vagina, and the external portion of the os and cervix, like that of the skin, is constantly acid; while within the cervical canal the surface is as constantly alkaline. These analogies are strongly confirmed by what is observed of the pathological lesions to which these parts are liable, and by the effects of therapeutical applications. Several of the common skin affec-

tions are closely imitated on the vaginal surface and the vaginal portion of the cervix uteri, and give way to treatment adapted for genuine skin diseases. It is also well known that when inversion of the vagina occurs, as in procidentia uteri, the secretion of vaginal mucus is suspended, and the epithelial layer of the vagina becomes hard, and similar to epidermis.

"The epithelium found upon the follicular surface of the canal of the cervix is cylindrical or dentated, like the epithelium just within the os. It is also ciliated low down in the cervix, but not at its very lowest part, and the ciliated character is continued into the cavity of the fundus uteri. The villi found in the upper portion of the cervix are covered by dentated epithelium, just as is the case with the villi of the lowest part of the cervix. Mixed with the epithelium of the follicular surface of the cervix, a considerable number of caudate corpuscles are frequently found, each having a distinct central nucleus. These are probably nothing more than altered epithelial particles. The epithelium of the os uteri and external portion of the cervix is, like that of the vagina, constantly squamous; the epithelium, just within the os uteri, is cylindrical, but not ciliated. Various opinions have been held respecting the point at which the squamous epithelium becomes changed for the cylindrical, and also respecting the point at which cilia are first found. The above is the result, however, of the examination of many uteri, made as early as possible after death, so as to anticipate the alteration of the cilia and epithelium by post-mortem changes. The situation in which cilia are first found in ascending the utero-vaginal tract varies a little in different subjects, but, I believe it will be found that the transition from squamous to dentated epithelium constantly occurs just at the margin of the os uteri. * * * * * * *

"It will be seen that from the nymphæ to the entrance of the fundus uteri, the glandular structures are arranged at two principal stations, namely, at the ostium vaginæ, or the cervix vaginæ, as it might be called, and at the cervix uteri. There is no apparatus for any considerable mucous secretion in the space between these two points."

The vaginal canal is formed of three layers, first, the internal or mucous; secondly, the middle or erectile; thirdly, the external or contractile sheath.

The mucous membrane is studded with villi or papillæ, some of which have two or three club-shaped terminations growing from a single stem.

Fig. 1.



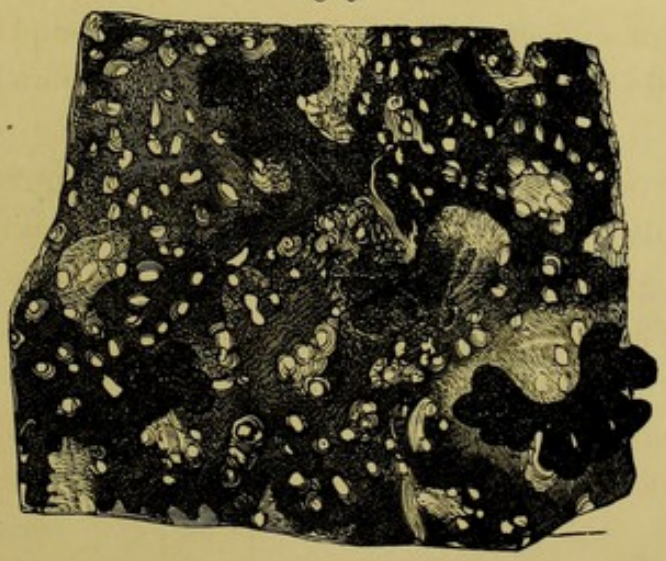
Two of the transverse rugæ, with one perfect fossa between them, from the virgin cervix, 18 diameters.

Fig. 2.

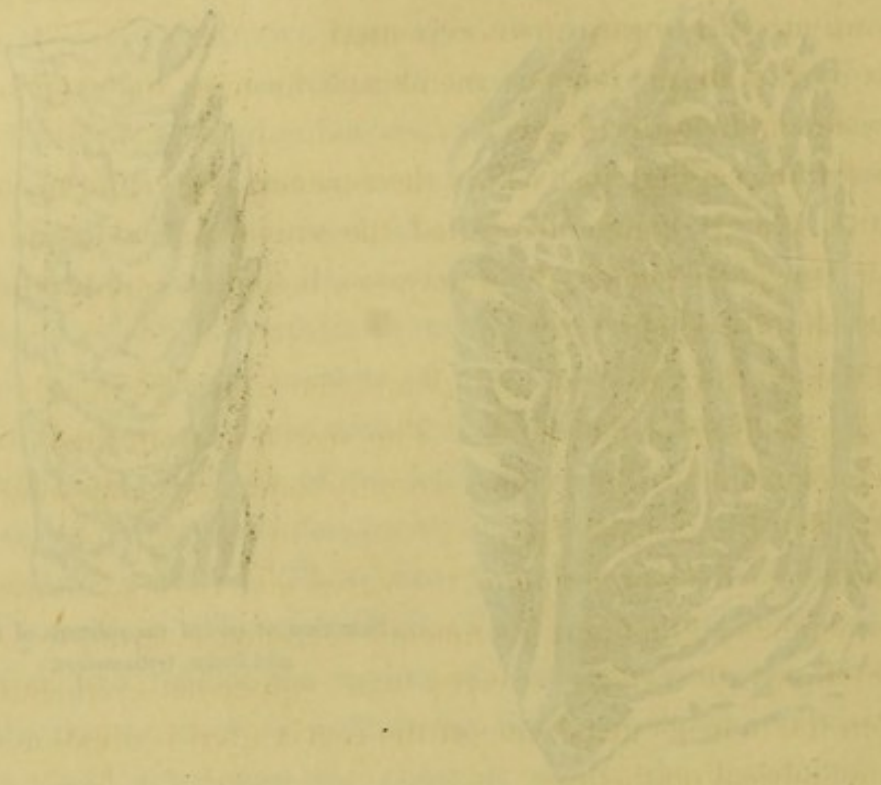


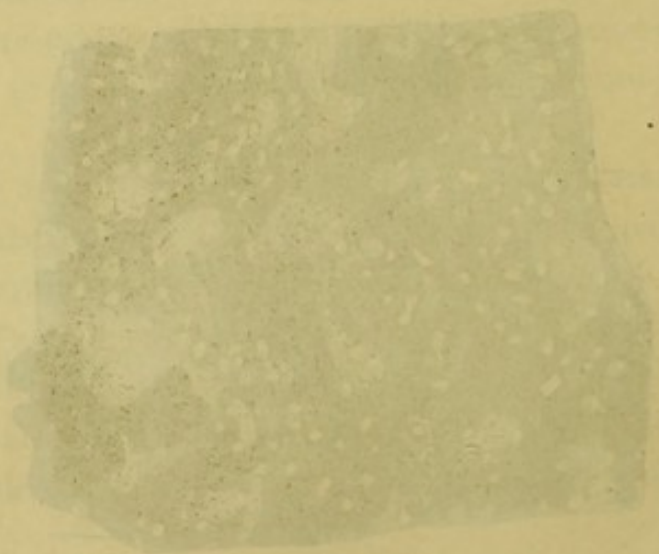
Side view of one of the columns of rugæ and fossæ, 6 diameters.

Fig. 3.



Sebaceous follicles, after a drawing from a preparation by Dr. Hassall. The dark bodies are the sebaceous glands, the white spaces are the depressions in which the papillæ have been received; 18 diameters.





Around the entrance they are very numerous, and abundantly supplied with capillary vessels; they diminish in numbers; and their vascular supply lessens on passing upward toward the cervix uteri.

In that portion of the mucous membrane forming the *cul-de-sac* there are but very few follicles or glands.

At the ostium vaginæ, just within the carunculæ myrtiformis, are situated two large glands, commonly called the vulvo-vaginal glands, or the analogues of Cowper's glands, their purposes being to supply the vaginal entrance with an oily fluid.

In addition to the vulvo-vaginal glands, the vulva is thickly studded with sebaceous follicles or fat-glands. The secretion from these follicles is thick and tenacious, of a white color, strongly acid, and possessing a penetrating odor. See Fig. 3 plate 15.

The whole mucous membrane of the vulva and vagina is covered with a layer of squamous epithelium; its mucous secretion is strongly acid, as is the secretion from all surfaces covered with squamous epithelium. The secretion from the mucous membrane of the cervix uteri is alkaline, it being covered by cylindrical epithelium.

A piece of blue litmus brought into contact with the secretion of the vagina becomes reddened, but its color is restored if pressed into the cervical canal.

CHRONIC CERVICAL METRITIS AND ENDOMETRITIS.

The subject of corporeal metritis and endometritis has been so fully considered by my assistant in his report of cases treated in the out-door department of the hospital, that I shall not refer to it, but confine myself to inflammation of the cervix, which, from its exposed position and complex glandular construction, is peculiarly prone to disease.

By chronic cervical endometritis, I understand a low grade of inflammation confined to the mucous membrane lining the cervical canal, between the os externum and internum, and covered by columnar epithelium. It does not include inflammation affecting the vaginal surface, which is entirely different in its character.

It is by far the most common of all the maladies to which the genital system of the female is liable. It is the starting-point of some of the most serious and rebellious of uterine disorders.

Causes.—Laceration from parturition, abortion, too frequent indulgence in marital intercourse, particularly when that function is imperfectly performed, which is very apt to be the case with men whose lives are devoted to hard study, or who, from any cause, have exhausted their nerve-power before marriage.*

"Such persons marry; anxiety for children, or some other complex feeling, leads them to over-frequent attempts at sexual intercourse. The act is incompletely performed; nervous apprehension leads to still more frequent attempts, and its more incomplete performance, and, unless by good fortune pregnancy has taken place very soon after marriage, a condition of permanent congestion of the cervix uteri is induced, and the wife becomes as inapt for conception as the husband for procreation.

"Inflammation of this gland may occur, however, from a generally depraved condition of the system, independent of any local irritation. I have frequently met with it in unmarried women of whose chastity there could be no question.

"It is not a disease self-limiting in character. Unless proper treatment is adopted, the inflammation, at first confined to the lining membrane of the cervical canal, spreads to the parenchyma. If this occurs during the functional life of the uterus the probable result will be hypertrophy and indura-

* West.

tion; but if the climacteric period is about to occur or has passed, the more probable termination will be epithelioma."

Symptoms.—In the early stage of the disease the symptoms are not well marked; indeed it may exist for a length of time without the patient being conscious of any local trouble. There may be a general feeling of malaise, and indisposition for exertion, particularly when walking or standing, but acute pain is not one of the symptoms present at the commencement of the disease, or indeed at any period of its existence. Leucorrhœa, frequently profuse, is always present; at first it has the appearance of boiled starch, but this soon changes to a somewhat thinner puriform matter. The secretion from the cervical canal being alkaline, its passage over the mucous membrane of the vagina, whose normal secretion is acid, causes irritation, accompanied by an increase in the quantity and an alteration in the character of the vaginal mucus. This mixing with the secretion from the cervix causes its puriform or sanguineo-puriform appearance. Sometimes the discharge is sufficiently ichorous to excoriate the labia and inside of the thighs. The patient's whole nervous system becomes implicated from sympathy with the local affection. The digestive function is among the first to suffer; nausea, loss of appetite, and constipation being the common attendants. The blood becomes impoverished as the result of impaired nutrition, and, as Thomas observes, "she will become nervous, irascible, moody, and hysterical." Complications rapidly develop themselves, the most common of which is cervical metritis. With this there is always pain, more or less acute, during sexual intercourse, pain in the back, and painful and excessive menstruation, in addition to the symptoms already enumerated.

Cervical endometritis may exist independent of cervical metritis, but cervical metritis rarely exists uncomplicated with endometritis.

Physical signs.—If the disease is confined to the upper part of the cervical canal, there may be no enlargement of the os, or abrasion of the mucous membrane around it, to indicate the existing trouble, but there will be seen hanging from the os a ropy, tenacious mucus, like the white of an egg, sometimes a little yellow, but rarely tinged with blood, which it will be found difficult to remove, as it adheres firmly to the depressions between the rugæ. If the disease implicates the whole of the canal, the os will be patulous and the vaginal portion of the epithelium covering its margin destroyed, laying bare the papillæ, presenting to the unpracticed eye the appearance of

ulceration. If the inflammation has spread to the parenchyma, there will necessarily be hypertrophy in addition to the foregoing pathological condition. If the disease is confined to the cervix, the passage of the uterine probe will meet with obstruction at the os internum; if the body of the uterus has become involved, no obstruction will be offered to the passage of the sound, but it will cause great pain.

Treatment.—If the disease is simple endometritis, the first care must be to place the patient under the best possible hygienic influence. The condition of the alimentary canal must be carefully watched, all depressing influences removed, and the largest amount of fresh air obtained with the least possible exertion. Her food should be nourishing, easy of digestion, but not stimulating, and marital intercourse strictly forbidden. If necessary, an infusion of some vegetable bitter may be administered to increase the appetite, and a preparation of iron to enrich the blood.

Locally.—The first step will be to dilate the canal sufficiently to admit of the thorough application of alteratives. This is best effected by the carbolized sponge-tent. One of small diameter should be selected; it should taper towards the point, and only be introduced as far as the os internum, never being permitted to pass through it. If this precaution be taken no unpleasant complications will follow. It is the violence done to the fibres of the internal os that occasions the acute inflammation which sometimes occurs after their use.

The os having been well dilated the mucus must be carefully removed and a solution of nitrate of silver (20 grains to the oz.) applied to every portion of the membrane. If the mucus has not all been removed, the alterative will not reach the glands situated in the sulci between the rugæ. Some practitioners prefer chromic acid, and others carbolic acid, as an alterative; either is good. The importance is not so much in the choice of caustics as in the thoroughness of their application. After the caustic has been applied, a pledget of raw cotton, soaked in glycerine containing two or three grains of the watery extract of opium, should be passed into the posterior cul-de-sac. The pledget should be removed in a few hours.

This course of treatment will have to be pursued in some cases for several months before a cure will be effected. The erosion around the os requires no treatment; it is dependent for its existence upon the cervical inflammation, and as soon as the parent disease is disposed of, its offspring will disappear. To use Dr. Emmet's apt illustration, the erosions around

the os uteri are like the excoriations upon the lips of children who are suffering from ozæna. Cure the ozæna, and the excoriation will take care of itself. If, however, the inflammation has existed sufficiently long, and been severe enough to affect the parenchyma and produce a general cervicitis, we have a much more difficult disease to combat.

The general treatment will be the same as in endometritis. The local treatment, in addition to that recommended for endometritis, will consist in the abstraction of blood by leeches from the posterior cul-de-sac, the daily use of the hot douche, and such other remedies as the exigencies of the case may suggest, the indications being to allay the pain, and reduce the hypertrophy which is always present.

As each case has its own particular history and indications, the general method of treatment will be best illustrated by a report in detail of a few of the cases treated in the hospital.

I have met with no instance of inflammation of the parenchyma of the cervix uncomplicated with endometritis, and the report is therefore confined to endometritis and general cervicitis.

Chronic cervical endometritis.

Case 1.

A. T——; aged thirty-two; admitted July 2, 1866; married at nineteen; has never been pregnant; her health not good for the last two or three years. She complains of pain in the back and hips, and profuse leucorrhœa, which discolors her clothing and excoriates the nates and inside of the thighs.

Examination.—Os patulous and filled with a tenacious, ropy mucus; the investing mucous membrane abraded; papillæ enlarged, and to the inexperienced eye presenting the appearance of ulceration. The introduction of the sound caused no pain; the os internum not patulous.

Treatment.—Hot douche morning and evening, continued for fifteen minutes. A small-sized sponge-tent introduced to dilate the cervical canal, and removed at the end of twenty-four hours; its presence gave no pain. A solution of nitrate of silver, (20 grains to the oz.) was applied every fourth day, the application followed by the introduction of a pledget of raw cotton saturated with glycerine. Her bowels were kept open by the occasional use of a belladonna suppository, followed by an enema of tepid water. As a tonic one drachm of the sirup of the phosphates of iron, quinine, and strychnine was given after each meal.

The patient's recovery was slow, nearly four months having elapsed before she was sufficiently improved to leave the hospital. She remained several months afterward under treatment as an out-door patient.

She became pregnant for the first time in the spring of 1869, and in January, 1870, gave birth to a healthy male child. Her recovery was good and involution of the uterus perfect.

Chronic cervical endometritis.

Case 2.

F. K——; aged twenty-three; admitted August 25, 1866, single; has been employed in a printing-office as feeder to a cylinder press. Her occupation kept her upon her feet for ten and sometimes as many as fifteen hours out of the twenty-four. Her health has been failing for two years, and she has now become so weak as to be unable to follow her occupation. She complains of a severe pain in the loins and hips, leucorrhœa so profuse as to necessitate the use of a napkin constantly; her monthly periods are regular and painless, but the discharge excessive. She has constant pain in the top and back part of the head, her appetite is capricious, digestion imperfect, and the bowels are obstinately constipated.

Tongue furred, the edges marked by the teeth; breath offensive; pulse 118 and weak.

Digital examination.—Vagina relaxed, cervix long but normal in position. The posterior cul-de-sac was occupied by a tumor easily raised and not tender; rectum filled with scybalæ. The speculum revealed the os patulous and the mucous membrane around it eroded. The discharge from the cervix was less tenacious than usual in such cases, approaching more nearly to pus. The sound was passed with some difficulty, disclosing a complete retroflexion of the uterus. It was easily replaced, but, upon the withdrawal of the sound, the fundus fell back again into the posterior cul-de-sac.

Diagnosis.—Chronic cervical endometritis, with retroflexion of the uterus, due to atony of the muscular fibres of its lower segment.

The uterine disease in this case was secondary. The primary trouble was a depressed condition of the vital powers, brought on by excessive fatigue. The nervous system failing under undue taxation, the digestive function necessarily became disordered. The uterus being an erectile organ, suffered in common with the rest of the system from enervation, its retro-

flexion not being due to any hypertrophy of the posterior wall, but to the want of power in the lower segment to sustain the fundus in its normal position.

The general treatment pursued in this case was the same as in case No. 1, but locally the hot douche was omitted. The uterus was partially retained in position by a pledget of cotton saturated with glycerine, placed in the posterior cul-de-sac.

The patient gained strength rapidly, and the discharge lessened. By the latter part of October the cervical disease became scarcely recognizable, but there was no improvement in the position of the uterus, and it was determined to try the effect of a current of electricity, directed through its muscular fibres, daily.

The hospital being full, she was discharged as an in-door patient, and I arranged with her to call at my office for the continuation of treatment.

One pole of the battery was passed up the rectum to the fundus uteri, and the other applied to the os, the application lasting on each occasion ten minutes. These applications were continued for a little more than three months with moderate regularity.

The effect was all that could have been desired. The cure was complete.

It is seldom I have met with a case where the result of treatment has been so gratifying as in this instance. She entered the hospital completely broken down in health, and dejected in spirits, physically a miserable specimen of a woman. At the end of six months she had regained her health and spirits, her local trouble completely cured, and she was enabled to commence life anew with the consciousness of ability to gain a livelihood.

Chronic cervicitis.

Miss C——; aged thirty; admitted as out-door patient February 8, 1867. General health good; complains of inability to walk, pain in the back and loins, constant disposition to micturate, pain upon sitting down, the feeling being as if something tender was being pushed upward; profuse and offensive leucorrhœa.

Examination.—Vagina relaxed and capacious. At the entrance the finger encountered what was supposed to be a foreign body, but, upon further investigation, was discovered to be an enormously enlarged and elongated cervix, measuring two and one-half inches in length; the upper por-

tion was very tender, owing to the inflammation produced and maintained by the constant violence done to the organ by the ordinary movements of the body. The indication was first to reduce the inflammation, and then remove the whole vaginal portion of the cervix.

Three leeches were applied to the posterior cul-de-sac, and the hot douche used twice daily, followed, on each occasion, by the introduction of a suppository containing one grain of morphine.

Under this treatment, with absolute rest, the inflammation subsided, and in six weeks was sufficiently reduced to permit of the operation for removal with safety.

March 8.—The patient was placed in position on her left side and the cervix seized by a volsella and drawn downward; the upper portion, close to the vaginal reflection, was transfixed by a strong curved bistoury, and the removal effected by the flap operation.

The flaps were retained in apposition by the clamped suture for the deep portions, and the interrupted suture superficially. The object in using the clamps was to prevent hæmorrhage, which they perfectly control. A piece of catgut was placed in the cervical canal to keep it open. The parts united by first intention; no constitutional disturbance followed the operation, and the cure was complete.

Chronic cervical endometritis, with hypertrophy and induration.

Amputation of the cervix.

Case 4.

Mrs. O. L——; aged forty; admitted as out-door patient May 9, 1869. Mother of five children, the youngest four years of age. Since the birth of her last child she has suffered from aching in the back, leucorrhœa, pain upon sexual intercourse, and after a movement from the bowels. She has been twice under treatment, once for a period of five months and at another time for six months. She improved each time, but as soon as the local applications were discontinued became as bad as before. Menstruation occurred twice monthly, and was profuse, but not painful; her appetite was poor, and digestion imperfect. Her general appearance indicated suffering, being anæmic and feeble; pulse ninety-six and irritable.

Examination.—Os patulous, large enough to admit the end of the index

finger; cervix hypertrophied, and the portions around the os of stony hardness. It was a case to invite malignant disease, if it had not already commenced, and the amputation of the cervix was recommended without waiting for any preliminary treatment.

May 11.—The entire vaginal portion of the cervix was removed. The amputation being performed with scissors, no flaps were formed, the stump being allowed to heal by granulation.

No complication occurred during the after-treatment of this patient; she fully recovered, and at the present time is enjoying good health.

The number of cases that have been admitted into the hospital for disease of the cervix uteri are nearly double those admitted for any other disease of the uterus. The general symptoms, treatment, and results have been pretty uniform. The great difficulty experienced has been in detaining the patients long enough to effect a cure, most of them having families from whom it was difficult, and in some cases impossible for them to remain absent. As soon as improvement begins they wish to return home, and promise to continue attendance as out-door patients, but this promise is seldom kept. They frequently apply for re-admission months afterward, worse off than when first presenting themselves for treatment; and in several cases what appeared to be a simple inflammatory hypertrophy and induration of the cervix when first treated, has been found to develop unmistakable malignant disease.

I have reported but four of these cases, which are typical of all. The details of the others would be mere repetition and serve no good purpose.

I have amputated the cervix in a large number of cases in hospital and private practice, and in no instance has the amputation been followed by any complication. (See Dr. Ashford's report in Appendix.)

REMOVAL OF THE HANDLE OF A CROCHET-NEEDLE (IRON) FROM THE BLADDER.

L. S——; aged twenty-eight; admitted to Columbia Hospital January 14, 1872. This patient had been under the care of Dr. Magruder, of this city, who had made several attempts to remove from the bladder what appeared to be a large calculus. He had dilated the urethra and succeeded in crushing and removing several fragments.

Upon her admission I recognized her as a patient who had been in the institution two years before, and who had left only partially relieved of the trouble for which she was then admitted.

At the time of her first admission she complained of extreme prostration, loss of appetite and inability to sleep, and was frequently the subject of severe hysterical paroxysms; her bowels were costive; her menstrual discharges irregular and scanty; bladder and vagina irritable; leucorrhœa profuse. The urethra was patulous and congested, the clitoris hypertrophied, and there was unmistakable evidence of long-continued irritation about the vulva.

I was satisfied the woman was a victim of masturbation, and all the treatment she received while in the hospital was directed in accordance with that theory; such as large and continued doses of the bromide of potash, and the frequent use of a warm sitz-bath, followed by the local application of sedatives. A strict surveillance was kept over this patient, and on several occasions she gave absolute evidence of the practice of this vice.

Medication failing to cure and moral suasion to control her, she was dismissed from the hospital as incorrigible and incurable.

With the previous knowledge of this woman's habits, I was prepared, upon her second admission, to suspect something more than a simple calculus in the bladder; and, upon introducing the sound, and finding a body measuring between three and four inches in length, I was satisfied that my suspicions were correct, and that there had been some foreign body introduced into the bladder through the urethra, forming a nidus upon which a mass of incrustation had formed.

A careful exploration showed the walls of the bladder to be much thickened and contracted; upon injecting it with tepid water to ascertain its



Iron handle of a crotchet-needle incrusted with the salts of the urine. Removed from the bladder of a female by an incision through the vaginal walls. See page 202.

capacity, not more than thirteen drachms could be forced in; its walls appeared covered in every part with incrustations. The foreign body was imposed immediately over the entrance to the bladder, and transversely. Urine dribbled from her continually, and she suffered from severe pain in the supra-pubic region.

From the contracted and inelastic condition of the bladder it was feared that any attempt to change the axis of the foreign body, so that it could be removed by the urethra, would result in a rupture of the bladder and death of the patient, and it was decided to remove it by an incision made in the viscus through the vagina.

Patient being fully ætherized was placed upon the operating table, there being present most of the consulting board of physicians and the full clinical class. A free incision was made through the vagina into the bladder, the walls of which were enormously thickened. Upon introducing the finger through the opening the mass could be felt firmly wedged. A pair of forceps was passed through the urethra, the foreign body firmly seized, and, by forcibly depressing the posterior wall of the bladder with the finger, which was introduced into its cavity, its point was liberated and the mass withdrawn. Removing a portion of the incrustation the nidus was found to be the iron handle of a crochet-needle, around which had been wound and knotted some common hempen cord, evidently for the purpose of making its surface more irritating. See Plate 16.

Upon sweeping the finger around the bladder the whole surface was found to be incrusted, hard, and unyielding, and felt like the inside of a rough stone vessel.

The fistulous opening was allowed to remain, the parts being in no condition for union, and to afford a better opportunity for treating the bladder.

A stream of slightly acidulated water was injected daily through the urethra, passing out through the vagina, each time carrying with it a quantity of the incrusted salts from the walls of the bladder. An injection of glycerine and carbolic acid followed the tepid water.

This plan of treatment locally, and bromide of iron internally, were continued for several weeks, when the fistulous opening was closed in the usual manner.

On the third day after the closure of the fistula, the nurse informed me

that she feared the operation would be a failure, as the woman was continually abusing herself with the catheter that was left in the bladder.

An examination showed the part to have been torn open, two of the wires torn out, and the edges bleeding.

On the ninth day the balance of the wires were taken out and about half the fistula was closed.

One month was allowed to elapse before any further attempt at a closure of the opening was made, when the operation was repeated and the patient kept under the closest surveillance day and night. The wires were removed on the tenth day after the operation, and union found to be perfect.

The parts were examined frequently during the following three days, the hydrostatic test applied, and the bladder found tight. On the morning of the fourteenth day after the last operation the nurse detected the patient using the long nozzle of the enema-pipe in her urethra, and it was found that she had forced it through the newly united parts and again created a fistulous opening.

Thoroughly disgusted and disheartened with the case I dismissed her, telling her, however, that when prepared to behave herself decently I would make another effort for her cure.

The pages of this report are not the proper place to enter into a discussion as to the means to be employed to check the fearful vice of self-pollution. That it exists to a most alarming extent there is no doubt. Nor must it be supposed that it is a habit of modern date or in any way due to the luxurious habits of civilized life. As far back as we can trace the records of our profession we shall find reports of similar cases, a large majority of them proving fatal to the unfortunate victims. Our insane asylums can tell the tale of its fearful prevalence.

It is a great social evil, to be met and grappled with by those who have the task of educating our youth. The province of the physician is to cure or alleviate the diseases to which it gives rise, and they are a legion. The principal of these are phthisis, mania, and heart-disease. It is high time that medical authorities put aside the morbid sentimentalism which has hitherto prevented a free discussion of the ailments which this practice gives rise to. The Lancet, of 1870, suggests, in a series of leading articles, that all medical and surgical authorities should fearlessly discuss this abominable vice and its attending physical evils with the same freedom they would any

kindred class of nervous affections. Acton, Ritchie, and Esquirol have already done so; let others follow, until the penalties of this vicious habit are sufficiently well known to prevent its practice.

Often the medical man is misled by the statements of the patient, and the long range of sympathetic diseases to which the practice gives rise are ascribed to any but the right cause; and even in spite of the most positive evidence, such men as Velpeau, with a faith in human nature irreconcilable with his experience, when speaking of foreign bodies in the bladders of females, makes the following remark:

"A woman tormented with attacks of the colic was not cured, according to Van-der-Wiel, until she had discharged through her urinary passage a ball she had swallowed. And among the examples of calculi of the bladder which have exhibited for their nucleus points of spindles, ears of wheat, &c., it is probable that they reached there through the migrating process.

"These substances having arrived in the stomach or intestines get entangled in some of the folds of the mucous membrane, and gradually escaping outside of them, continue to march in this or that direction according to the disposition of the parts."

In 1857 I was sent for to see a young lady in New York, a patient of Dr. Edwards, who was suffering the most intense agony in the region of the bladder; her urine, which was passed every few minutes, was mixed with blood. The urethra was patulous, admitting the little finger readily; a probe passed into the bladder came in contact with several pieces of hard substance, giving a clear, distinct sound when struck, but feeling too smooth for stone. For some time the patient denied having introduced anything through the urethra, but finally admitted that she had been in the habit of using a small female syringe, (glass,) and on the day on which I saw her had pressed too hard upon the piston and fractured the lower part of the syringe, the pieces remaining in the bladder.

It was impossible to extract them by the urethra without lacerating the part. The surest and safest plan was to cut into the bladder through the vagina, remove the pieces, and close the parts immediately with the silver sutures; this was done, and the patient recovered without any unpleasant symptoms.

On another occasion a young girl of fifteen had been using a long hair-pin, which was drawn from her fingers into the bladder, but fortunately it

was too long to pass entirely in, and the two ends remained within the urethra. It was with some difficulty removed.

These are by no means uncommon cases. Old as well as modern authors report abundance of them. The surgeon, it must be noted, is only called upon when the foreign body is in the bladder to remove it. The gynæcologist is constantly called upon to treat cases where there has been no accidental loss of the article used, but where the patient is suffering from a long train of nervous disorders produced by this vicious habit.

Morgagni, in his work published in 1768, reports the following cases, which are full of interest:

"A country girl, almost of the same age with that formerly spoken of by me in the Ephemerides, for she died in her fourteenth year, having done the same thing as the former, sixteen months before, deservedly suffered the same misfortune. For, having introduced a brass hair-bodkin, notwithstanding it was bent in the middle, very high into the urethra, she perceived that it was suddenly snatched out of her fingers, and entirely hid within the bladder.

"Being restrained by shame, she not only then, but even almost quite to the time of her death, was silent as to the true cause of the pains and uneasinesses which she felt, and particularly in making water; which were so many and so great that a tumor having, at length, arisen in the hypogastrium and the nearest part of the ilium, a pus was discharged by two foramina that it had made for itself; one larger and one smaller; the former of which was in the left ilium, and the latter on the right side, in that part which is properly called, with Laurentius, the 'fines hypogastrii.'

"Being thus affected she was received into the hospital at Padua, a month or two before death. It was there easily observed that, together with pus, urine was poured out through each of the foramina, but more through the left, under which was a cavity of pretty considerable size, wherewith the right foramen also communicated.

"As, in this cavity, the probe met with something hard, I was asked what I supposed this could be. I immediately called to mind what had resisted the probe when it was introduced through the fistula, which had opened itself in one of the ilia, and had discharged urine with the pus, in the former girl. And when I heard that this girl was also tortured with pains of the bladder in making water, and that she discharged only a small

quantity of urine, and that purulent, I answered that it was necessary to inquire whether she had introduced a needle or anything else of the like kind into the urethra. The girl denied it, till the left foramen being enlarged by a slight section of the common integuments, the point of the bodkin, and the greater part of its length, were evidently seen within the cavity by everybody. Then, what she could no longer hide, she too late confessed. For even the bodkin could not be extracted, by reason of a calculus that was formed upon it; which calculus, though it was easy to perceive it by introducing the probe through the passage of the urethra, or through that cavity, yet it was impossible to move, even the most slightly, without great pain.

"And the same calculus prevented their injecting anything into the urethra, to assuage the pains, by blocking up the passage. To these symptoms were added a very great wasting of flesh; the quantity of pus was increased every day; and the putrid smell and the fever became very violent.

"These symptoms were followed by a loathing of all food; a vomiting, and discharge by stool, of a yellow liquid matter; a dejection of strength, and weakness of pulse, till death at length put the wished-for end to so many miseries and complaints, among which complaints there had never been heard any of a pain in her loins by those who examined her upon that head.

"The carcass, which seemed to be a skeleton covered with skin, was dissected in the open air, and in a very large place, on account of the time of the year being very hot; for it was the beginning of July in the year 1738.

"I, first of all, ordered the probe to be passed through the right foramen into the cavity of the ulcer, and the whole sinus to be laid open—this was betwixt the muscles of the abdomen and the integuments—nor was there any communication, in any part, but with that cavity.

"The cavity was, in length and in breadth, three inches; extending itself from the left ilium toward the linea alba, having a thin posterior paries, which the remains of the muscles and the peritoneum made up, and by which it was separated from the cavity of the belly; but in the same paries, which was open on the right side, it communicated with the fundus of the bladder; and there a great part of the bodkin was prominent into the cavity of the bladder.

"The abdomen was then cut into in such a manner that the incision did

not reach to the bladder; which, although the cavity was small, had coalesced pretty high, that is, above the os pubis, with the internal surface of the abdomen, in that part only where it lay open into the cavity of the ulcer; so that nothing could be discharged into the general cavity of the abdomen, wherein there really was not the least extravasated fluid.

"And even the lower border of the omentum, which had scarcely any remaining fat, in most places, was closely connected to the neighboring peritoneum of the bladder.

"These appearances being seen, and the bones of the pubes being drawn asunder, the whole bladder was disclosed to view; and itself, together with the urethra, was laid open; the coats of these cavities were found to be thickened, but so contracted, that besides the calculus they could scarcely contain anything.

"The internal coats of these parts, which were unequal, and ulcerated in many places, adhered to the stone here and there; and were, like the cavity of the ulcer, in many places gangrenous also.

"The calculus was a little more than two inches long, being somewhat thicker than a man's thumb, and in its shape resembling an egg, the vertex of which was turned upward as the point of the needle was also, with all that part which went to the angle whereof I spoke in the beginning, being almost parallel to the calculus, and disjoined from it by the interval of an inch; the remaining part of the needle was also on the outside of the calculus, as far as could be conjectured, almost universally; the head only, with some of the neighboring portion of it, being very firmly infixed to the middle and left side of the calculus; that is, covered over with the calculous concretion; which portion is, on that surface, and at both of its extremities, very unequal; on the opposite surface almost smooth and somewhat white, except where it was tinged of a yellowish color, as the whole left part is; which circumstances I describe as I now see them; for at that time it was bloody in some places, and in others of a dirty brown color.

"At that time, also, the calculus being examined, as it is connected with the needle, by medical weights, was found to be a few grains lighter than seven drachms; but now it is a few grains heavier than five drachms and two scruples.

"Most of the other parts of the belly were in a preternatural state. Their appearances were as follows:

"Some of the intestines were a little livid, and somewhat turgid with that yellow humor which was last of all discharged; the liver was whitish; the spleen was pretty livid, and a little larger than it generally is. But the ureters, and the kidneys themselves, were in a very bad condition indeed; for these canals were dilated, and full of pus, of the same kind with that which was found in the cavity of the ulcer in considerable quantity; for it was very liquid, and of a yellowish color, inclining to white; or, in other words, it was a pus mixed with urine. And the kidneys were preternaturally enlarged, especially the right, which was also very hard, and internally hollowed into small cells, that were in great number, and so distended with the same kind of pus as the pelvis was also, that it rushed out, to a considerable height, upon dissection.

"The adipose and proper coats of the left kidney being joined to each other, thickened, and indurated, confined the same kind of pus betwixt themselves, with which the surface of the kidney, that was eroded in some places, overflowed; as the internal parts did also in several places.

"But the very filthy odor which exhaled from the kidneys and the bladder forbade us going on to open the thorax; no mark of disease in that part having appeared.

"The dissection being thus finished, you will readily conceive, from what I shall here subjoin, somewhat more at large, what I then immediately said, according to my custom, to the many men of eminence, and others, both medical and chirurgical practitioners, and students, who heard me.

"What reason could induce this girl, and so many others, to thrust the heads of needles, or bodkins, into the urethra, is not so much to be inquired after in the lacunæ of the fallacious humor, inasmuch as they open in other parts, and even on the outside of the urethra, unless you, perhaps, suppose that those canals also, which I described within the urethra of women, belong to this class also, as in the exquisite sense of the membrane wherewith it is internally invested. For unless they applied the friction very high up in the urethra, it could not happen, that, by a sudden and strong contraction of the lower part of the bladder, the needle should be snatched out of their fingers, and be quite buried in that cavity; especially when the needle is pretty long.

"For from the bladder, and its sphincter, I account for this misfortune, agreeably to the opinion of Molinetti; and not from a certain power of the

uterus, as they say, which, even if it had this power of drawing downwards itself, would not, however, draw what was thus acted upon, into the bladder. In some cases the needles have fallen out, of themselves, after having been taken in; as happened to two girls that are spoken of by Vallisneri, to one when she was asleep, and to the other when she was making water; I suppose, because in these they had only entered the bladder in part; that is to say, the crooked needle easily remaining with one part in the urethra, while the other was retained in the bladder for a month.

"On this part, however, no calculous matter had been formed; as is also said not to have happened to a needle that was thrust in by a fourth, and discharged after fifteen days, at the time of making water; which needle it is probable had been obstructed, in its passage through the urethra, at its lowest and acute part, from this symptom, that she only complained of a sense of pricking about the neck of the bladder.

"But although these things that I have said about the point of the needle, or bodkin, being fixed in the urethra, will be more illustrated by what will be hinted afterward, yet I shall not deny that needles, which have been received quite into the cavity of the bladder, may nevertheless be so turned therein, as, in like manner, to be discharged by the meatus urinarius. But that to those two, whereof I spoke last, no calculus adhered, within fifteen days, and even within the space of a whole month, there must have been more than one reason, as we have known this matter to adhere to others in much less space of time.

"For the urine, in all persons, is not equally impregnated with particles fit to recede therefrom, and generate a calculus; and some retain their urine longer than others do; and the matter, or surface, of different needles is different. Thus Vallisneri has supposed that a silver needle, or bodkin, was taken out from the bladder, without the addition of any calculous concretion, merely for this reason, that it was silver; which conjecture, however, will be much more credible, if it shall, at any time, be confirmed by other experiments.

"Thus a concretion seems more likely to adhere to a pretty rough surface than to a very polished one; and hence, perhaps, we are to account for this circumstance, that one part of the needle is, for the most part, covered with a calculous matter, while the other is left quite naked. Of the two girls, therefore, whose bodies I examined after death, in the former the head of the

needle, or pin, had perforated the bladder, and in this other the point; because, in the former, the concretion more easily gathered round the lower, and perhaps rougher part, and in the latter more easily about the opposite extremity.

"But out of those women who have had a needle, which had been thrust into the bladder, and a calculus of a considerable size formed upon it, none, that I remember to have read of, carried it for a very long time, yet had the needle extracted afterward, and was saved, except that Venetian woman whose case is published by Molinetti (under whom she was cured in 1649) with a figure of the needle, and the calculus added thereto, which he used to show in this anatomical theater, where Moinichenius, in his epistle to Thomas Bartholin, asserts that it was seen by him; for Bartholin himself, an author in other respects very learned, has through carelessness asserted this, he could not be witness to the calculus, which was extracted after he had departed from Padua, and even from Italy.

"And this calculus is the same which is spoken of by the same Moinichenius, in his observations; and this I have hinted at, because, in the latter part of the annotation to the observation of Vallisneri, both of which I have often referred to, it does not seem to be acknowledged for the same, which Vallisneri had said was wont to be shown in this theater, and is now preserved in his museum; for as to his saying that it was taken from a Paduan, instead of a Venetian woman, that I suppose was the cause of the error, which would have been easily avoided if Molinetti had been read, in whose book he seems not to know that it is described; and I also say that Lanzonus seems to have been ignorant of it, as he would, otherwise, in his scholium to that observation of Moinichenius, have been less surprised 'that a bodkin of bone should have lain buried so long in the bladder, without any injury to the bladder itself, and even without any inconvenience to the girl.'

"This, the words even of Moinichenius, and much more those of Molinetti, did not suffer him to suppose, not only when speaking of what she suffered in the extraction, but also when describing what she endured, both before and afterwards.

"Yet if the bladder of this girl was much less hurt by the needle than the bladders of those whom I have written of, this probably happened because the point of the needle stuck longer in the urethra than in the bladder;

and was, at length, pushed out of this passage by the weight of the calculus forcing downwards from above, as Molinetti found it.

"These calamities, and even death itself, may be prevented, by the person who, being timely warned of the case, can extract the needle before the accretion of any calculous matter; and this with such dexterity that the bladder, as far as it is possible to avoid it, may not be injured. And this has been done with success, not only by others spoken of in the works of Vallisneri, but also by two of my friends in particular, whom I have commended to you already; I mean Marianus and Vulpius.

"The former of these gentlemen, as he told me in a letter sent to me in the beginning of December, in the year 1720, took out a needle from the bladder of a country-girl, who already made bloody urine, after having industriously brought it from a transverse to a direct position. And it was a hair-bodkin made of bone. But that which I saw extracted by Vulpius, from a certain girl of this city, was made of brass. And he had extracted it, a few weeks before I received the letter from Mariani, with the use of no other instrument than a very smooth iron wire, one extremity of which he had so incurvated into the shape of a small hook, and almost into the shape of a ring, that it could not hurt the bladder, and yet could lay hold of the pin, and would not suffer the head of it to slip when once laid hold of.

"However, if the case is not known till much later, and a calculus is already gathered around the needle, and this calculus is not of such a kind as to allow of its being easily drawn out through the urethra, it will be necessary, before the woman be subjected to the tortures of a very difficult extraction, to make diligent inquiry, not only whether the bladder, which it is natural to all to suspect, but whether the ureters also, and particularly the kidneys themselves, (which suspicion arises from our dissections,) have already contracted so much disorder, that if even the needle and the calculus are taken away the woman must die nevertheless.

"And the conjecture of the kidneys being disordered will not be taken so much from the pains of the loins, (which we have seen may be absent,) or, as it probably happened in the girl now in question, may be obscured by the much more cruel tortures of the bladder, according to the aphorism of Hippocrates, as from the suppression of urine in the bladder, which has sometimes preceded, continued for a long time, and been more than once repeated, or from the very frequent retention to avoid those severe pains, or from too

small a discharge; in estimating which, however, we must take care lest we are at any time deceived by the continued dripping of urine, calling to mind that, with this stillicidium, a retention thereof may be joined, and that in a very great quantity, as I shall show when I speak on the subject of lameness, although this has already been sufficiently shown even by other letters. And indeed the Sepulchretum will present us with a history, in which you will read that the neck of the bladder was found so lax from paralysis, as 'easily to admit the finger;' for which reason the urine came away before death, without the patient's feeling it, yet the bladder, 'though almost twice as large as it naturally is, was entirely filled nevertheless.' And how much the retained urine had enlarged the ureters, you have learned from those letters, and how much it had, also, dilated the cavity of the kidneys, and had injured the substance thereof, or in one of them at least.

"And if these things happen from a part of the urine being retained, how much more will they happen from a long and repeated suppression of the whole of it within the bladder, or from a frequent retention both of urine and of pus? At least you have many examples of this kind, in the Sepulchretum, from a suppression, among which are those of Rumlerus and Ballonius, the latter of whom saw a very enlarged state of the ureters, and the former these canals full of urine, and the kidneys of so large a size, in a child, as they could scarcely have had in an adult.

"And for this reason the celebrated Fantonus, with justice, supposed that where more urine is drawn off by the catheter than the bladder seems to contain, 'it may partly flow down from the distended ureters also, and sometimes even partly from the enlarged kidneys.' That is to say, when the bladder can now contain no more; whatever urine is continually secreted in the kidneys first distends the ureters, and after that the kidneys themselves also. Nor did this escape Aretæus. 'Where the urine is suppressed,' says he, (meaning in the bladder,) 'the superior parts also, that is, the kidneys, are filled, and the urinary ducts, which the Greeks call ureters, are distended.' And as these circumstances happen where there is not said to have been any calculus before in the bladder, and where there is none at present, as may be read in the examples proposed, and in like manner in that which is related by the authors of the Commercium Liberarium, or in the acts of the Cæsarean Academy, or in the Acta Helvetica; for the discharge of the urine from the bladder being hindered by the abscess thereof,

or by the coarctation of the passage through the prostate, or the influx into the bladder being prevented by the very great diminution of its capacity, 'an enlarged state of the kidneys and of the ureters,' or, at least, a dilatation of them so as to 'exceed the thickness of the little finger, or even equal that of the largest,' immediately occurred to the eye. As these things, therefore, happen, even without calculi, they certainly ought not to have been imputed only to the obstruction of calculi in the ureters, which resist the descent of the urine by a man in other respects very inexperienced. Nor ought it to have been argued, from the circumstance of a certain person having only one calculus in the bladder, but both his ureters dilated, that this calculus had necessarily been made up by the coalition of two, one of which had been obstructed in one ureter, and the other in the other.

"But as those things that I have mentioned happen even where the bladder may be extended to a very great capacity, you, without doubt, perceive how much more easily they must of course happen if the bladder is either contracted into itself, as in one of the examples referred to, or has its cavity occupied by some foreign body internally, and leaves but little space for the urine within, and sometimes scarcely any, whether an ischuria or a strangury only be the consequence.

"Thus you have, in the Sepulchretum, an observation of Silvius, after an ischuria of the ureters 'frequently admitting a man's thumb, and containing urine within them quite to the kidneys themselves,' as he says, not in the second, but in the first book of his Praxis Medica, chapter the fifty-sixth; and you have, also, that which is described as communicated to Riolanus, of the kidneys being 'larger than usual by one-half, filled, and turgid with serum;' and 'of the ureters being very large, and so distended as to be capable of admitting the little finger with ease.'

"And you will read in the same place that Cattierus found, after the strangury, 'the kidneys distended and turgid with urine, (from which parts, when cut into, it flowed out copiously,) and the ureters very wide;' and these were found to be 'very large' by Fantonus, whom I have already quoted, even after a dysuria from a cause of the same kind; and in proportion as the dysuria, like that, is more severe, it generally has the more violent strangury joined therewith.

"As, therefore, in the two girls whose bodies were examined by me, there had been a very severe dysuria, and the bladder was very much con-

tracted, and almost wholly occupied with the calculus, it is not surprising that the urine, before it could pass out a little more freely from thence, through a passage made by the needle, should stagnate in such a quantity in the ureters and kidneys as to dilate, and even to vitiate them, especially when mixed with the pus which flowed from the ulcerated coats of the bladder.

"A young country-girl, having had a bone-bodkin, which she used for her hair, drawn into the bladder in the same manner as those already spoken of, although it created pains and many uneasinesses, they did not, nevertheless, extort a confession of the fact before that, a calculus having formed itself around the needle, she was affected with intolerable tortures.

"Then, at length, the situation thereof being examined, the point of the needle was found to be prominent within the cavity of the vagina, the urethra being perforated near to the lower part of that cavity.

"It seemed to Mariani that, if the urethra were cut into a little in a longitudinal direction, this point might be drawn into the urethra; and, by this means, the needle and the calculus being placed in a direct situation, it might be tried whether by scaling away this calculus, which was, perhaps, of a fragile nature, gradually and dexterously, it were possible to reduce it to such a state of thinness as to suffer it to be taken away with the needle.

"But as others were of a contrary opinion, it happened that nothing at all was attempted, but that the girl was deserted, and given up to her miserable lot.

"In process of time the calculus, and the pain also, were increased; and the whole orifice of the bladder being now almost stopped up, but a small quantity of urine, and that very ill-smelling, was discharged And a fever also coming on, an end was, at length, put to her miserable life.

"The belly being opened, pus was seen in the pelvis thereof, and was supposed to have been poured out from the kidneys, which were suppurated. In the bladder, which was corrupted with a sphacelus, was a calculus of the figure of a pear, for the more it descended from the head, and the upper part of the needle, the more was it extenuated.

"When it was taken away from the bladder, to which it adhered in some parts, it left scales agglutinated to that part; and yet, when put in the scale, together with the needle, was then equal to eighteen drachms; but afterward, when this account was sent to me, it weighed no more than fourteen.

"The person who, as I have said above, had successfully extracted the needle from another girl, before a stone had been formed upon it, did not despair but this also might be taken out, even when the calculus was begun, and increased to a considerable size, if, the point of the needle being reduced into the urethra, and held fast with a forceps, he endeavored previously to extenuate the calculus, if it were possible, before he drew it out, in imitation of Benivenius, who diminished it in the urethra of a virgin, in some measure, previously to its extraction; or if this did not succeed according to his wish, then to imitate Molinetti, who had taken care to have it extracted by force, at all events; and it is probable that something might even then have been of service.

"But after the calculus had been so much augmented in its size, and with this every disorder had increased, who is there that could hope for any advantage? And if the calculus had been so much thinner, and the passage, though which the cavity of the urethra communicated with the cavity of the vagina, had been so much larger, as they must both of them have been in a case of this kind, which, being sent from Italy, you read of in the history of the Royal Academy of Sciences at Paris, perhaps this also would have fallen out into the vagina, in the same manner as that did.

"But I should believe, even in that case also, that the passage had been from the upper part of the urethra, rather than from the bladder into the vagina, since we read that an afflux of urine, through the vagina, did not succeed, but only an incontinence of urine.

"For whether the needle is not wholly snatched away from the fingers, into the bladder, in many persons, as I conjectured above; or, if you please, whether, after it is wholly carried into the bladder, it is again pushed back into the urethra, by the contraction of the bladder; although the former of these suppositions seems to me the more probable, since the point that was held in the fingers, and not the head, or, at least, in the examples of Molinetti and Mariani, and in as many as I shall immediately produce, was certainly turned toward the urethra; nothing can more easily happen than that, the head being pushed forward, by the posterior part of the bladder, in consequence of the annexed vagina, then libidinously turgid, being, in like manner, forced forward, the point of the crooked needle is driven backward, and by this means fixes itself into the posterior part of the urethra, especially if it is very sharp; and at length, being driven by the frequent contractions of the bladder, perforates that part.

"And as this happened in a young country-girl, who applied to our surgeons at the time of my writing this letter, so it would also have happened in a young virgin of fourteen years of age, the case of whom was related to me by a surgeon, whose preceptor in anatomy I had been, not long after the death of the other, whose dissection I have described to you.

"The girl was in a sitting posture when she did the same thing as the other, and had thrust the head of the bodkin, which was almost as thick as the urethra itself, very high into this meatus; and being terrified by the sudden appearance of her mother, at once let go the bodkin, and found it drawn up very high, at the same time.

"Almost four days she bore the pains and uneasinesses in silence; on the fifth day she told her mother the affair, and her mother told it to the surgeon of whom I have spoken; who, supposing from the seat of the pricking, of which the patient chiefly complained, that the lower part of the needle stuck fixed about the middle of the urethra, and fearing lest, if any instrument were introduced into the urethra, to extract this inherent body, it should be entirely pushed on into the bladder, he, with the consent, and even at the request both of the mother and daughter, introduced first one finger, and then another, into the vagina, and by this means so far moved the needle downward, with no less industry than success, that the point began to appear at the orifice of the urethra, and could be laid hold of with the forceps.

"Thus, with the loss of two drops of blood only, and without any inconvenience remaining behind, the needle, which he brought to me, was taken out. This needle, or bodkin, was, or, at least, seemed to be, of tin, and was of that kind which women use for their hair, being four inches long, and having a very sharp point; and the surgeon had observed that a little tartarous matter had already begun to adhere to it in several places, which matter was, afterward, very improperly rubbed off.

"I would not have you be chagrined to find that what has been asserted by some persons seems to be confirmed by the number of examples I have added; I mean that the women, to whom these things happen, 'are, the greatest part of them, Italians.' I could wish all our country-women knew how many of their sex have been untimely carried off by the most excruciating tortures from this cause.

"But how can country-girls, of the lower class, and such as even their

tender years render unexperienced, be acquainted with these things? Yet such instances ought not to be passed over in silence, that physicians, being admonished by the frequency of them, may, if any girl begins to complain of a difficulty of making water, inquire very narrowly into every circumstance; and, by a cautious dexterity, force out the truth, while it is as yet possible to administer relief.

"However, neither these instances are common to all parts of Italy, (or, at least, not to some of them, where I have been for a considerable time,) nor are all foreign countries free therefrom; which examples it is by no means necessary for me to take notice of here, with an odious diligence; some of them you will learn, if you ask me now, from reading Vallisneri, others from Platner; and, finally, some you will meet with in the reading of other authors.

"Nor do I doubt but more examples would be extant, if as many bodies were dissected in every other place as they are in Italy; or, if shame did not oblige most women to conceal the true cause of their disease. For others, as even among the women of this region a country-girl was about to do, and as some, according to Alghisni and Vallisneri, have done, conceal the whole affair with the most obstinate silence; it therefore happens that the needle, of which nobody has any suspicion, is buried together with them.

"And some girls pretend to have swallowed it, in order that physicians, notwithstanding they find it either in the living or the dead body, may be deceived by such an assertion.

"There was a time when such deceptions took place even in Italy; as by that Venetian virgin spoken of by Alexander Benedictus, about the latter end of the fifteenth century, who had a large calculus formed upon a very long bodkin, such as women use in their hair; for notwithstanding this author has rejected the opinions of those who supposed the needle to have passed through the veins, from the stomach to the liver, from thence to the heart, and from this viscus to the kidneys, and so on to the bladder; yet, he himself thought 'that by its point it had gradually, and in a long course of time, penetrated through the intestines, and made a passage for itself to the bladder;' although he is much to be commended for having discarded the opinion, which, to my great astonishment, was embraced by others, even a long time after, and is not easily to be imitated in proposing another, which had a much greater number of followers.

"Nor is the question here of any slender needle, but of thick ones, and very often of those which have a large head at one extremity, and at the other not a very sharp point; and always (I mean in those shame-faced virgins who say that they had been swallowed by them) purposely, as it were, going to the bladder, and not attended with those previous and concomitant symptoms and pains which a circumstance and passage of this kind required.

"Wherefore this kind of credulity is now more rare; or, at least, among the more learned Italians; the retention of which, in some other countries, I see pretty clear marks of, even in some excellent books.

"It remained to take notice not only of the needle, but of the case wherein they are kept, having passed the same way, since that excellent man Benevoli says that he had extracted one from the bladder of a Tuscan girl.

"Here, again, you will perhaps be displeased that a vice almost incredible should be imputed to an Italian girl. But read, I beg of you, the annotations that are made to article one thousand three hundred and fifty-nine of Platner's Institutiones Chirurgiæ, and you will see whether she was the first that had attempted this thing."

Stone in the bladder.—Removal by vaginal section.

A. M——; aged forty-seven; admitted October 17, 1871; American by birth; single. I was requested to see this patient by Dr. Ritchie, of Georgetown, before her admission to the hospital. She complained of intense pain at the meatus urinarius whenever she passed water, constant distress in the supra-pubic region, and all the long train of symptoms attending the presence of a foreign body in the bladder.

The sound readily detected a stone, which was too large to be removed with safety through the urethra, as the requisite dilatation would probably have been followed by paralysis of the sphincter, and incontinence of urine.

The patient was desirous of having the operation performed at her house, which was assented to, on condition of her removal to the hospital as soon as sufficiently recovered, for the purpose of undergoing treatment rendered necessary on account of the diseased condition of the bladder.

September 20.—Patient was ætherized and placed on her left side, after which, a staff having been introduced, an incision one and one-half inches

long was made through the vaginal wall, and the stone easily found and withdrawn.

The parts were closed, as in ordinary vesico-vaginal fistula, by ten silver-wire sutures, and a self-retaining catheter left in bladder. The sutures were removed on the tenth day, when union was found perfect.

The stone was composed of lithic acid and oxalate of lime, and measured, in its greatest diameter, one and one-eighth inches.

The distress endured for several years was only partially relieved by the operation, and on October 17 she was admitted into the hospital.

Examination of the urine disclosed the presence of blood and pus in large quantities.

The treatment adopted was the administration, three times daily, of an emulsion of almonds containing twenty grains of the bromide of potash and twenty drops of the balsam of copaiba. The bladder was washed out every morning with tepid water, followed by an injection of glycerine, one part, water, three parts, and carbolic acid, five grains to the ounce. A morphine suppository was introduced into the vagina after each injection. The capacity of the bladder, at first small, gradually increased.

Under this treatment she slowly improved, and on January 23, 1872, was discharged, with instructions to report bi-weekly for the purpose of continuing the injections. These were kept up until June of the same year, when further attendance was dispensed with.

Thanks to Marion Sims, the operation for removal of stone in the bladder of the female has ceased to be formidable or dangerous.

It may be objected that a stone of this size, and even much larger, could be removed through the urethra after dilatation. This is quite true, but to dilate the urethra effectually frequently requires a long time, and is productive of great pain. A much stronger objection is to be found in the consequent incontinence of urine.

The operation performed in this case is safe, simple, and not likely to be followed by complications.

Urethral caruncles.

There are two different kinds of urethral caruncles, alike in appearance, but differing anatomically. Both are highly vascular, bleeding with the slightest touch, the mere passage of the urine over them being sufficient to rupture some of the capillaries. One form is exquisitely sensitive, the

other possessed of little sensation. The irritable caruncle has a rich distribution of nervous filaments in it, which, according to some observers, terminate in bulbous expansions, not like the tactile corpuscles in which the tactile nerves of the skin are supposed to terminate, but more resembling neuromas in their construction.

The ramification of the blood-vessels in them have precisely the appearance of the vasa vorticosa. The majority of the vessels are much larger than capillaries, but their walls are equally simple in structure, which accounts for the readiness with which they are ruptured. Wedl regards these bodies as "dendritic, papillary, new formations of connective tissue." Their size varies from that of a pin's head to a cherry. They generally arise from the mucous membrane of the urethra, near its orifice. Their attachment is by a broad base, but sometimes they are pediculated. Those attached by a pedicle are seldom sensitive.

If we except fissure of the anus, there is no disease of so trifling a magnitude productive of so much intense suffering as an irritable caruncle. I have known women, who would bear the pains of child-birth without a murmur, shrink from the necessity of urinating, and put it off until the bladder became over-distended, and when finally compelled to pass water, their groans revealed the excruciating agony they endured.

Professor Simpson reports the case of a shepherd's wife who had one of these sensitive caruncles at the orifice of the urethra, and whenever she was obliged to pass water, was in the habit of going some distance from her cottage, in order that she might moan and scream unheard, so intense and intolerable was the suffering which at such times she experienced.

No age or condition is exempt. I have seen these caruncles in young girls before puberty, and in old women over seventy; in the single and married; but I have never seen one in a patient of purely phlegmatic temperament.

The diagnosis is easy if the examination be made with care. Digital examination is useless; it must be made by the eye, and frequently the lips of the meatus must be separated before you discover the caruncle, although, in the majority of cases, it is situated on the edge of the lower lip of the meatus.

The prognosis of permanent relief is by no means favorable, as they

are essentially recurrent, repeatedly returning after the most careful and thorough removal.

The treatment will depend upon the nature of the caruncles. If not painful or inconvenient, *leave them alone.* I frequently observe them in patients who are unconscious of their presence. If sensitive, remove them. The method I adopt is to pass a tenaculum under their base, taking care to introduce and bring the point out in sound tissue, and then with a pair of curved scissors cut the tenaculum out and with it the tumor. Fuming nitric acid is then applied to every portion of the raw surface, followed by a solution of the carbonate of soda to neutralize the excess of acid.

For two days before and for one week after the operation, the patient should be placed upon the copaiba mixture, in order to render the urine bland and unirritating.

Ligatures, as a means of removal, are inadmissible, as their application produces much more pain and are less efficient than the knife or scissors, it being impossible to include the whole of the diseased structure by this process.

Nineteen cases have been treated in the hospital, and in all the removal was effected in the manner here recommended. In several, the disease returned in a few months, and was again removed, but the larger portion did not re-appear. I have no doubt the disease returned in these also, and presume advice was sought from some other sources, owing to dissatisfaction with the necessarily unsuccessful treatment pursued in the hospital.

EXTIRPATION OF THE PAROTID GLAND.

Mrs. C. S——; aged thirty-two; mother of two children, has heretofore enjoyed perfect health. She seeks advice on account of a large tumor which occupies the site of the right parotid gland. It is painful, unsightly, and inconvenient. She first noticed it about five years since, and for three years it increased but little in size; its growth, however, within the last six months has been very rapid, the pain increasing with the size.

The tumor was as large as an orange, independent of the portion which dipped back under the jaw, and extended as high as the anterior portion of the zygomatic process; it was of medium consistency and lobulated. The first impression was that it might be a carcinomatous degeneration of the gland, but the healthy appearance of the patient, her age, the length of time in which she had suffered with the disease, the healthy condition of the skin, and the neighboring glands being uninvolved, made it improbable, and it was decided to be a fibroid degeneration of the gland, and its removal recommended.

January 2, 1872, assisted by Doctors R. Reyburn, N. Young, F. A. Ashford, and H. McBlair, I removed the entire gland with its capsule. Patient, being fully ætherized, was placed in a semi-recumbent position, the head well elevated. A semi-lunar incision was made from the zygomatic process downward and backward behind the angle of the jaw, passing over the center of the tumor, the flaps were dissected off and the upper part of the mass exposed. The separation was made from above downward, the size and shape of the tumor rendering that course preferable to working from below upward.

The detachment of the upper portion of the tumor was readily effected, but the dissection of the lower and deeper portions was tedious and difficult. The styloid process was imbedded in the lobes, which dipped backward, completely encircling it. The stylo-glossus and stylo-pharyngeus muscles were so unusually thin as to be scarcely discernible, and were with difficulty preserved.

The arteries tied during the operation were the temporal, transverse facial, occipital, internal maxillary, lingual, facial, and external carotid. When the mass had been removed, the appearance of the wound was frightful. At the side lay the common carotid, the jugular vein, and pneu-

mogastric nerve; at the bottom were the attenuated styloid muscles, partially covering the pharnygeal opening. A portion of the aponeurotic sheath of the vessels had been sacrificed with the tumor.

The danger most to be feared was suppuration and burrowing of pus in the deep tissues of the neck. This could only be avoided by the careful adjustment of compresses, so as to bring every part of the wound in apposition.

The patient was allowed to recover fully from the æther, and reaction to be well established before the flaps were adjusted; the compresses were made of raw cotton, soaked in carbolized glycerine, and so arranged that all portions of the tissues were in contact.

The jaws were firmly bandaged, it being intended to permit no movement of them for several days.

10 p. m.—Patient comfortable; pulse eighty-four, soft and regular.

January 3, 10 *a. m.*—Has passed a good night, having slept from eleven until six in the morning; complains of the jaws feeling stiff, but no special pain; pulse eighty.

January 4, *noon.*—No undue heat about the wound; everything progressing well; patient sitting up.

January 7.—Sutures removed; every portion had united by first intention.

January 15.—Ligature loose from facial artery.

January 19.—Ligature loose from internal maxillary artery.

January 22.—Ligature loose from carotid artery.

The recovery of this patient was rapid and perfect. The deformity from the paralysis occasioned by the division of the branches of the facial nerve was much less than is usually stated to occur, and a few months after the effect of the operation was not noticeable.

There had been no return of any disease in the part from which the gland was removed up to July, 1872; the patient at that time appeared in perfect health.

Plate 16 is a transfer from a photograph of the tumor, taken the day after its removal, and is the exact size. A careful examination of the mass proved it to be the parotid gland in a state of fibrous degeneration. This, with its capsule, was removed entire.

It has been questioned, by some authorities worthy of consideration, if



Parotid gland, removed from Mrs. C. S., January 2, 1872. Photographed on wood.

it was possible to remove the entire gland, and reported cases have been supposed to be merely tumors growing on, in, or adherent to, the gland.

Erichson says: "Excision of the parotid gland is occasionally spoken of, but is rarely, if ever, done. I believe that in most, if not all, the cases in which it is stated that complete removal of the gland has been accomplished, tumors overlaying and compressing it have been mistaken for it."

Gross remarks: "Considering the narrow space in which the parotid gland is situated and the complexity of the relations which it sustains to the surrounding structures, is it possible to extirpate it in the living subject?" Considering the present state of the science of surgery, he says: "I should consider it great folly either to doubt its possibility or to deny its propriety. That the operation is difficult of execution, requiring the most accurate knowledge of the anatomy of the parts and the most consummate skill, is certain; and unless the surgeon is fully possessed of these important qualities, failure, if not disgrace, will be sure to attend his efforts."

Allan Burns states that the operation is impracticable, and Coulson, of London, denies the possibility of its performance. There is no doubt, however, that the whole gland has been removed repeatedly with success, but the large majority of cases reported were undoubtedly not removals of the gland, but of tumors occupying its site.

The statistics of this operation are not sufficiently good to offer much inducement to surgeons to undertake it, but I believe the unfavorable reports have been mainly due to the fact that, in the larger proportion of the cases reported upon, malignant disease has existed.

Successful removal of a hypertrophied third lobe of the thyroid gland.

K. M——; aged twenty-two; admitted April 13, 1867. The patient complained of a tumor which was situated immediately below the thyroid cartilage, and had become a source of annoyance from its large size and pressure upon the trachea.

The tumor was hard and globular in form; palpation gave no evidence of fluid; and from its central position and the absence of any lateral enlargement it was not suspected to be a part of the thyroid gland, but an adventitious fibroid or fibro-cystic formation bound down by the deep cervical fascia. It was not apprehended that its removal would be attended with any unusual difficulty.

April 14, clinical class present. Patient having been fully ætherized, an incision was made, commencing at the lower border of the thyroid cartilage and continued downward for two and one-half inches, and the skin reflected from either side to the fullest extent admissible by the length of the incision. To expose the tumor fully it was necessary to divide the sterno-hyoid and sterno-thyroid muscles.

As the dissection proceeded it became evident that an error in diagnosis had been made, and that the growth was an hypertrophy of the third lobe or pyramid of the gland. It was too late to retreat; the only proper course was to proceed and remove the tumor. The incision was extended one inch, to give room for further dissection, every step of which was followed by a gush of blood, which was restrained with difficulty.

When the base of the growth was reached it was found to be adherent to the upper rings of the trachea and lower edge of the thyroid cartilage. A needle, armed with a double ligature, was passed through the center of the attached portion and each half of the tumor firmly tied; its connection was then severed. After the hemorrhage, which lasted two hours, had ceased, the parts were washed with a weak solution of carbolic acid, the edges of the incision were brought in apposition and retained by silver sutures, and the ends of the ligatures brought out at the most dependent portion. Ice-water dressings were constantly applied.

For two days the patient had considerable fever; pulse went up to one hundred and twenty; but under the use of opium the fever subsided, and no further constitutional symptoms were manifested.

April 24, the sutures were removed and every part was found to have united except at the point where the ligatures were brought out. The ligatures were slow in separating, the last not coming away until May 19.

May 28, the patient was discharged, cured.

Commentary.—Although this tumor was unsightly and occasioned considerable annoyance by its pressure upon the trachea, the symptoms were not sufficiently urgent to have justified the risk of so hazardous an operation as the removal of part of the thyroid gland.

The error in diagnosis occurred from the position of the tumor, which was central, its well-defined outlines, and the absence of any enlargement of the right or left lobes. An hypertrophy of the pyramid of the gland was not thought of in forming the diagnosis.

IMPACTED FÆCES DIAGNOSED AS OVARIAN TUMOR.

Miss C——; admitted April 24, 1869; aged twenty-two years; native of New York; for the last five years resident of Brooklyn; was sent to me last April for the purpose of having an abdominal tumor removed which had been pronounced by her medical attendants "ovarian."

The patient was of medium stature, sallow complexion, emaciated and very feeble; abdomen enlarged to about the ordinary size of a woman seven months advanced in pregnancy.

Tongue heavily coated, breath fœtid, pulse one hundred and eighteen and feeble. She complained of continuous pain in the left side, extending down the thigh; subject to severe exacerbations, pain in the back, increased when lying upon her right side; micturition frequent but not painful; bowels troublesome, the passages being watery and not completely under her control. She had not had a solid passage for several months. Stomach was very irritable, rejecting food almost immediately, milk with lime-water being the only nourishment that could be retained, and that required to be administered in small quantities. Sleep disturbed by unpleasant dreams; menstruation painful, scanty, and irregular.

Her aunt gave me the following history of the case prior to the time of her coming under my charge:

She had been a robust, healthy girl up to the time of her present illness, which commenced two years before. In March, 1869, she complained of pain in her left side, and, for the first time in her life, of headache. This continuing, a physician was consulted, who relieved her for the time, but both pain in the head and side returned. The pain increasing in severity, an examination was made, and a tumor the size of an orange discovered on the left side of the abdomen, which was painful upon pressure; if the pressure was continued, it produced nausea. It was decided that she was suffering from inflammation and enlargement of the left ovary.

Vigorous treatment was adopted, both constitutional and local, with the view of reducing the inflammation and bringing about a resolution of the tumor, but all to no purpose; the tumor steadily increased in size, and the patient rapidly failed in health. The symptoms becoming alarming, a con-

sultation was held, which resulted in the confirmation of the previous diagnosis, "ovarian tumor;" and as all the constitutional distress was believed to be dependent upon the local disease, a surgical operation for its removal was recommended, and for that purpose she was sent to this city, where her aunt resided, and placed under my care.

Her general appearance was that of a woman suffering severely from "ovarian disease"—anxious expression, pinched features, and prominent enlargement of the abdomen. A careful physical examination showed the tumor to be confined to the left side. It was firm, resisting, and irregular in outline; palpation revealed no fluid; the fingers readily passed between it and the spleen, excluding enlargement of that organ as a possible condition.

The tumor was on the wrong side to be due to enlargement of the liver, and not sufficiently mobile for a cyst in the omentum. Pregnancy was excluded by the history and position of the tumor; as also distension of the bladder from accumulation of urine.

The diagnosis was narrowed down to fibrous tumor of the uterus, mutilocular cystic degeneration of the ovary, or impacted fæces.

Vaginal examination.—Fundus of uterus pressed over to the right side; sound entered two and one-half inches, movable antero-posteriorly; the finger introduced into the rectum could get between the uterus and the tumor, and upon moving the sound there appeared to be no connection between them.

There being no enlargement of the uterus, no history of any hemorrhage, and the tumor not being movable, excluded the theory of fibrous tumor of the uterus, pedunculate or interstitial.

Upon turning the patient upon her right side, and percussing deep in the left iliac fossa, no tympanitic sound could be discovered indicating the presence of intestine, nor could the tumor be pressed over toward the right side; it was firmly bound down in the fossa. The symptoms were all negative; no positive diagnosis could be made. The tumor was too tender for ovarian, nor was it sufficiently large to have produced such an amount of interference with the functions of the abdominal organs as would cause the severe constitutional disturbance under which the patient was suffering. Her age rendered malignant disease unlikely. For these reasons I suspected a mistake had been made in the previous diagnosis, and that the tumor was not ovarian, but due to an enormous accumulation of impacted fæces.

An elastic tube was introduced into the rectum, but failed to pass the upper portion; it there met with a firm resistance, the least pressure giving great pain. There was no fæcal matter upon the tube when withdrawn. A further examination revealed an impaction of scybalæ in the whole track of the colon. I was now satisfied that the tumor was fæcal, and so told her friends.

To remove this mass by the action of cathartics was out of the question. Mechanical interference was equally inadmissible, and I determined to adopt a plan of treatment which I had seen practiced by my friend Doctor F. H. Baxter, United States Army, with the most signal success.

This treatment is based upon the following theory: "Constipation is due to excessive contraction of the circular muscular fibres at the top of the rectum, and not to deficient power in the longitudinal fibres of the muscular coat of the colon; that the obstruction is to be overcome, not by increasing the transmitting power of the longitudinal fibres, but by diminishing the contraction of the circular fibres, which are mainly under the control of the sympathetic nervous system; that atropia exercises a special influence upon the sympathetic, and if administered in sufficient doses will cause a complete relaxation of the circular fibres, not only of the upper part of the rectum, but of the whole intestinal track."

I do not propose to go into a defense of these propositions, but prefer to report the treatment adopted in this case with the results, and leave my professional brethren to judge whether the theory is supported or disproved by the facts.

May 2.—The patient was confined to the bed, and her abdomen covered with a soft pad of muslin, (three thicknesses,) soaked in an infusion of stramonium leaves. The pad was cut to fit in between the superior spinous processes, and not allowed to go above the umbilicus, its application over any part of the stomach being sure to excite vomiting. A suppository was introduced into the rectum for three consecutive nights, each one containing the eighteenth of a grain of atropia, followed in the morning by an enema of about one quart of water with one ounce of sweet oil. This had to be thrown in carefully, about half a pint at a time.

For the first three mornings the enema returned without any solid fæcal matter, the pain in the left side, at the point of termination of the transverse colon, being very severe. I applied a large cup over the part, taking about two ounces of blood. This succeeded in reducing the pain.

The following morning, May 6, I had the satisfaction of seeing nine lumps, which had passed with the enema. They were irregular in shape and partially covered with inspissated mucus. They were very hard and dry.

The patient was exhausted, and complained of a burning sensation in the rectum, which was relieved by an injection of pure glycerine, (one ounce.)

May 7.—Nothing solid passed with the enema to-day. Milk was rejected as soon as taken into the stomach.

May 8.—Pupil fully dilated. Thirteen lumps passed in the morning, and seven in the evening, of the same size and character as those passed on the 6th; but two or three were inclosed in capsules of tenacious mucus. Bladder very irritable; urine highly colored and offensive; nausea persistent; pulse one hundred and twenty, and small. Suppositories and enema discontinued; it was evident my patient could not stand so rapid a dislodgment of the mass. Alimentation by the stomach was suspended, and injections into the rectum of one ounce of beef-essence every four hours substituted. A suppository, containing half a grain of morphine, was placed in the rectum at bed-time.

May 11.—Pulse one hundred and fourteen; tongue very red at the edge; great thirst; less nausea; less pain.

May 13.—Enema brought away two large lumps and a quantity of ropy mucus. Ordered the atropia-suppository to be again introduced.

May 14.—No lumps passed.

May 15.—Thirty-two lumps passed this morning. The exhaustion following this discharge was so great that for several hours the condition of the patient was alarming. Toward night she rallied and took a little milk-punch, which she retained. Suppositories were again suspended.

May 16, 17, *and* 18.—The bowels were allowed to remain quiet. There was some improvement in the general condition of the patient. Beef-tea injections were continued, and a little milk-punch retained in the stomach. The whole surface of the body was washed daily with whisky and water and rubbed briskly.

May 19.—Patient brighter; passed a good night; pupil about half dilated. Atropia-suppository again introduced.

May 20.—No fæcal matter passed with the injection, which gave great pain.

May 21 *and* 22.—Suppository introduced each night; pupil fully dilated. The patient was as much under the influence of belladonna as it was safe to place her; but no lumps had passed since the 15th instant. An injection of one ounce of glycerine was thrown into the rectum at night and retained.

May 23.—Three lumps passed, much larger than anything I had ever seen pass from the bowels; some bloody serum and mucus passed with them; in the evening more than three pints, by measurement, of large and medium-sized lumps were voided, some of them covered by a material looking like parchment, and a number of long strings of tenacious mucus. The tumor was much diminished in size, but very tender.

From this time to June 4, the same plan of treatment was pursued, occasional periods of rest being allowed for recovery from the prostration following the dislodgment of the lumps. All appearance of the tumor had now disappeared; but, upon a careful examination, it was found that the upper part of the descending, the transverse, and ascending colon was yet impacted, and it was not until July 10 that the whole intestinal track became clear.

The diet was carefully regulated all through the treatment, the return to solid food being very gradual. Dry-rubbing with a pickled towel was substituted during the later period of attendance for the whisky-and-water baths. From the middle of July to the end of August, the patient took three pills daily, each containing:

℞ Quiniæ valerianatis, gr. ij;
Ferri ferrocyanatis, gr. j;
Ext. gentianæ, gr. j.

On the 3d of September attendance was discontinued, the patient still feeble, but relieved of her disease. Her convalescence from that time to the present (November 1, 1869,) has been rapid. She has gained much flesh, her bowels move regularly by the use of an enema, her appetite is good, and her food digests without trouble; but, from the commencement of the treatment up to date, there has been but one attempt at menstruation. That occurred on the 10th of May.

In two other cases, in which I have used the atropia to the same extent, there has been an arrest of this function.

I have pursued the same plan of treatment in a number of cases of im-

paction and chronic constipation during the last year. It has been successful in all. In one case the patient voided in six days more than two pecks of hard scybalæ, which from its appearance must have been impacted in the track of the colon for months. No suspicion had been entertained that she was suffering from constipation, as she had complained of diarrhœa for several months. Her abdomen was very large, but the enlargement was supposed to be due to pregnancy. I saw this woman with Dr. Ritchie, who had seen her but once before, and finding her not pregnant requested the consultation. The result of the treatment was as astonishing to the doctor as to the patient.

PELVIC CELLULITIS.

In 1844, Marchal de Calvi published in France a monograph on "Intrapelvic Phlegmonous Abscesses," which was one of the first modern accounts of this disease. It contained a faithful description of its symptoms, pathology, and treatment. This paper was criticised at length in the Medico-Chirurgical Review, and the reviewer took especial pains to ridicule the study of ancient authors on medical subjects, and to sneer at the knowledge or supposed knowledge possessed by the early physicians of the science of medicine.

So far as this particular malady is concerned the remarks were unmerited. Aëtius, Paulus Aegineta, Archigenes, and Haly Abbas describe the symptoms, pathology, and treatment of the disease fully, under the head of "Abscess of the Uterus." The first and second named authors, after reciting the ordinary symptoms preceding the suppurative stage, go on to remark that, when the inflammation runs sufficiently high to form an abscess, we have the pain intensified, accompanied by irregular attacks of rigor, followed by intense fever and sweats, obstruction of the urine and fæces, from pressure upon the bladder and rectum by the affected parts. Sometimes, they remark, there is swelling in the region of the pubes, which gives a sense of fluctuation upon palpation. They direct the promotion of suppuration by cataplasms of various herbs and the use of the hot bath, suppositories of various narcotics to allay the pain, and the direction of steam into the vagina to induce the matter to point in that part.

They advise delay in lancing until the inflammation is arrested, as new abscesses might otherwise form and more than one opening have to be made. They also speak of the pus being frequently evacuated into the rectum, ulceration having taken place through the walls of the intestines.

We have made but little advance, if any, on their treatment of this disease. Their description of its symptoms is equally as clear as that given by modern authors.

For the general symptoms, pathology, and treatment of "Pelvic Cellulitis," I must refer to the standard works upon the diseases of women, one of the best of which is that of T. Gaillard Thomas.

The following cases are reported as containing points of special interest,

the exciting cause in each having been an attempt to dilate the cervical canal by a sponge-tent.

I have taken occasion in another portion of this work to caution the younger members of the profession against the indiscriminate use of uterine tents, as they are capable of producing intense mischief. When employed, the effect must be closely watched, and, as a matter of precaution, when it is necessary to dilate the internal os, its fibers should be previously divided.

Pelvic Cellulitis and deep Abscess in the Gluteal Region.

Case 1.

Mrs. A. S.——; aged twenty-four; admitted March 27, 1866; mother of two children, the younger of whom was fourteen months old. Her health had always been good, her labors easy and convalescence rapid. She weaned the baby when it was eleven months of age. In February, believing herself to be again pregnant, she sought the assistance of a professional abortionist, with the view of getting rid of the child, who introduced a sponge-tent into the cervical canal and ordered her to return the next day. The following morning, February 17, she was suffering too severely to leave her home, and her husband, who was not aware of what she had done the day before, sent for me. I found her with a rapid pulse, hot skin, and furred tongue, complaining of intense pain in the region of the womb and back, headache, and nausea. She objected to a vaginal examination. I ordered a full dose of opium, with five drops of Fleming's tincture, and a hop poultice to be applied over the abdomen. In the evening, finding no improvement, I insisted upon an examination, which, with much apparent reluctance, was granted. The vagina was hot and tender, and the presence of the tent was readily detected by the touch and characteristic odor. With some difficulty I obtained from the patient the history of the case as given above. The removal of the tent was followed by a gush of blood, but no fœtus or membranes appeared. The opium and aconite were ordered to be repeated every four hours during the night.

February 18.—Several large clots had passed during the night, but her husband having thrown them away I was unable to ascertain their character. There was less pain in the back, but otherwise no improvement in her general condition; pulse one hundred and twenty-six; respiration hurried; temperature one hundred and three; and great tenderness over the whole

abdomen. The opium and aconite were continued, and six leeches applied around the anus and perineum.

February 19, 8 *a. m.*—No improvement, the pain having increased rather than diminished. The opium in two-grain doses was ordered every two hours, and a large blister to be applied over the lower part of the abdomen.

7.30 *p. m.*—Patient was fully under the influence of the opium, pulse reduced to one hundred and eighteen, temperature one hundred and two. I left one of my students with her all night, with instructions to regulate the quantity of opium by the pulse and respirations, giving sufficient to keep her quiet unless contra-indicated.

February 20, 9 *a. m.*—Had passed a comfortable night; pulse one hundred and nineteen; temperature one hundred and two; tongue moist; pain in the abdomen less acute.

February 21.—Patient directed my attention to a tumor a little to the left of the median line, regular in outline, and hard as a stone. Its character was at once recognized.

From this time until the date of her admission to the hospital the treatment was soothing and supporting. There were occasional exacerbations of pain, frequent rigors, followed by fever and copious sweats. The tumor increased in size and extended into the left iliac fossa. The uterus was fixed and pushed over to the right side, and the wall of the upper part of the vagina was hard and tense.

On the date of her admission the tumor was as large as an adult's head. There was but little uneasiness in the abdomen, the principal seat of pain being the left gluteal region. She was emaciated, and her general appearance gave unmistakable evidence of long-continued and severe suffering.

March 29.—During the night the patient had several copious discharges from the bowels, which the nurse stated looked like pus. Examination failed to discover the tumor—it had evidently ruptured into the bowels.

After the discharge of the pus, the patient ran down rapidly. For more than two weeks the pulse remained at one hundred and thirty-six; tongue dry and dark; lips and cheeks covered with aphthæ; colliquative sweats and diarrhœa. Fortunately, her stomach not being irritable, she bore stimulants and nourishment well, and these, in conjunction with the chalybeate tonics were pushed to the point of toleration.

The discharge per rectum gradually diminished, the pulse became less

frequent, the diarrhœa was controlled, and the general condition of the patient became encouraging. The pain in the hip, however, had continued, and there was a decided tumefaction above the joint, which increased in size daily, and, upon palpation, gave an indistinct feeling of fluctuation.

Dr. J. Riley present.—The abscess was punctured with a large trocar and thirteen ounces of ill-conditioned pus drawn off. A piece of spiral spring made of silver wire was passed through the canula and left in the opening to keep it patent.

At the expiration of three weeks, the discharge continuing in quantity and very offensive, it was decided to enlarge the opening and apply nitrate of silver to the whole secreting surface. This was accordingly done, and, upon passing the finger into the cavity, it was found to contain masses of gangrenous tissue. These were removed, the cavity was washed out with Labaraque's solution, and its walls were penciled over with the solid nitrate of silver. Compresses were applied above and below to secure coaptation of the surfaces.

Convalescence progressed slowly, and it was not until the latter part of November that the patient sufficiently recovered to leave the hospital.

What was the cause of this secondary abscess? The theory of the formation of secondary or metastatic abscesses, from the absorption of pus as pus, and its conveyance into the general circulation, has but few adherents. Its advocates tell us that in these cases pus-corpuscles are found in the blood, but we now know that pus-corpuscles are only the altered white corpuscles of the blood, and the increased quantity which is sometimes observable in the circulating fluid of patients suffering from these secondary deposits is probably due to some derangement of the glandular system.

This temporary increase of white corpuscles, "leucocythosis" of Virchow, is frequently seen during pregnancy, and indeed it exists after every meal, as the physiological result of the enlargement of the mesenteric glands.

It was not due to thrombi arising in any of the veins of the pelvis, for in that case the detached portion of the thrombus would have been arrested at one of the bifurcations of the pulmonary artery, and embolism, with inflammation and gangrene of the lungs, resulted.

The following appears to me as the most acceptable hypothesis in this case: The pressure upon the posterior branch of the internal iliac artery, produced by the infiltration of the cellular tissue, was sufficiently great to

obliterate the cavity of the vessel and permit the formation of a clot or plug. When the pressure was removed, the current of blood forced the "embolus" onward until it was arrested at the bifurcation of the deep branch of the gluteal artery. The supply of blood to the part beyond the obturated vessel having been cut off, inflammation, with infiltration of blood into the tissues, resulted, terminating in gangrene.

Pelvic cellulitis.

Case 2.

Mrs. E. A——; aged twenty-five; admitted August 4, 1869; married when twenty years of age; has never been pregnant; has suffered from dysmenorrhœa since she was fourteen. The pain at her menstrual period had very much increased within the last two years, and latterly become so severe that she was compelled to seek medical aid.

Four weeks before her admission, a sponge-tent had been introduced into the cervical canal, her attending physician believing the dysmenorrhœa and sterility to depend upon mechanical obstruction. He informed me that during the progress of the dilatation she suffered intense pain, which continued after the removal of the tent, and, up to the time of her admission, she had several rigors, which were followed by fever.

Examination.—Vagina hot and dry; cervix normal in size and position; uterus fixed; posterior cul-de-sac occupied by an intensely hard tumor, which was immovable and very tender. Careful examination through the abdominal walls revealed a hard mass behind and on either side of the uterus, in which that organ appeared imbedded.

Treatment.—Eight leeches were applied to the cervix, and their application followed by the hot-water douche to promote bleeding. After the bleeding had ceased, a pledget of cotton soaked in Price's glycerine was placed in the vagina, and this application was continued daily. A suppository, containing two grains of the watery extract of opium and one of the English extract of belladonna, was inserted into the rectum, and the abdomen covered with a hot hop-poultice, which was renewed every six hours.

As soon as the acuteness of the attack had subsided, the abdomen was thoroughly blistered with the ætherial tincture of iodine, which, as a vesicant, I find more potent than the nitrate of silver, and free from the objec-

tions attending the use of that common and convenient counter-irritant, the fly-blister. The bowels were kept free by the use of belladonna-suppositories and injections of warm water. As an alterative, and to promote the absorption of the effused matter, ten grains of the iodide of potash were administered in the infusion of gentian three times daily. Her diet was nourishing, and, when indicated, stimulants were administered.

The progress of the case was slow; the inflammation spread from one loculament to another, until almost every portion of the pelvic cellular tissue had in turn been invaded. For a large portion of the time that the patient was under treatment her condition was critical, pulse remaining above one hundred and thirty and temperature one hundred and two and one-half. No abscess formed, however, the inflammation appearing to exhaust itself before reaching the suppurative stage.

It was nearly one year before all induration had disappeared and the uterus became freely movable, and fifteen months from the date of the attack before menstruation returned.

Pelvic cellulitis.

Case 3.

E. I——; aged twenty-five; unmarried; admitted July 24, 1870. Her first menstruation occured after her eighteenth year, which was scanty and accompanied with great pain. Eight months elapsed before it returned, since which time it has been irregular. The pain at each menstrual period has been so severe as to confine her to bed and to necessitate the administration of anodynes in large and frequent doses. Her general appearance was anæmic and scrofulous. She has been under medical treatment for the last two years, both in New York and in Philadelphia, and, from her own statement, appears to have been under the care of judicious and scientific men, whose best-directed efforts, however, proved unsuccessful in relieving her.

Examination revealed a retroflexion of the uterus with slight enlargement of the posterior wall. The uterine probe was introduced with diffi culty, the point of flexure resisting its passage, but in all other respects the genito-urinary organs appeared normal. The failure of previous treatment in this case (which did not appear to have been directed with the view of relieving the obstruction to the menstrual flow) suggested the propriety of

an attempt to straighten the cervical canal, as recommended and practiced by Dr. Marion Sims in similar cases.

Her menstrual period was expected about August 7, and it was determined to introduce a small-size sponge-tent to dilate the canal, a few days in advance of the menstrual *molimen*, and watch its effect before using the uterotome.

August 4, a perfectly smooth carbolized sponge-tent about one-sixteenth of an inch in diameter was carefully introduced, and the precaution adopted of inserting an opium-suppository into the rectum in anticipation of any possible trouble.

Dilatation was accompanied by such severe pain that it was necessary to remove the tent in less than six hours after its introduction; the patient was restless; pulse rose to one hundred and sixteen; skin hot and dry. The following day she had a severe chill, followed by fever, the pain extending over the whole abdomen, which had become tympanitic. Metro-peritonitis and cellulitis supervened. The peritonitis was controlled by large doses of opium, but the cellulitis ran on to the formation of a large abscess, which pointed and was discharged through an opening in the anterior cul-de-sac.

For several weeks the condition of the patient was extremely critical, the exhausting discharge and her inability to retain nourishment rendering her case almost hopeless, and it was several months before she had gained sufficient strength to travel to her home, in New Jersey.

In March, 1872, she was still feeble; the discharge had entirely ceased, but there had been no return of menstruation.

DISEASES OF THE RECTUM.

Hæmorrhoids.—It has been estimated that half the male population suffer from this disease; but, common as it is among men, it prevails more generally among women. It is seldom a woman who has borne children escapes an attack in a more or less severe form, nor is it difficult to account for the increased frequency of the malady in women. The pressure of the enlarged uterus in pregnancy prevents the return of blood from the pelvic organs and hæmorrhoidal veins. The same effect is produced by fibrous tumors, hypertrophies, and displacements of the uterus, which are so many additional causes to those existing in the male.

Hæmorrhoidal tumors, whether external or internal, are essentially of the same pathological character, and are characterized by an enlargement of the vessels of the rectum and an infiltration of their connective tissue.

External hæmorrhoids are composed of thickened integument, covering one or more dilated veins, with a mass of infiltrated cellular tissue. If the parts have not recently been inflamed they look like folds or duplicatures of the integument surrounding, or partially surrounding, the anus; but, if in an irritable or inflamed condition, they are hard and tense, and the integumentary covering of a deep-red or purple color. If split open, the central portion will be found to consist of a clot of blood surrounded by infiltrated cellular tissue, or, if the vein has ruptured, the blood, instead of being clotted, will have become extravasated into the surrounding tissue or formed for itself distinct cellular sheaths. The inflammation may subside and the extravasated blood be absorbed, or the extravasation may cause increased inflammatory action and the formation of an abscess.

The suffering occasioned by acute inflammation of external piles is out of all proportion to the circumscribed extent of the lesion. If the disease has been allowed to go on unchecked for two or three days the constitutional disturbance will be sufficient to prostrate the strongest man.

Treatment.—In the acute stage most authors agree in recommending the application of leeches. I have seen little benefit resulting from their use. The indication is to relieve pain and reduce inflammation. This, it appears to me, is best accomplished by freely opening the tumor, and turning out the clot of blood which it contains, and then applying a hot poultice to promote absorption, with which some anodyne and astringent may be incorporated.

I generally use the following ointment, spreading it thickly upon a piece of patent lint and applying the poultice over all:

℞ Ungt. gallæ co., ℥ss.
Aq. ext. opii, ℈j.
Pulv. camph., gr. x.
Ext. plumbi diacetatis, gtt. xx.
M.

A laxative should be administered, to keep the bowels free. In summer I use an electuary of sulphur and cream of tartar; in winter, a mixture consisting of two parts castor-oil and one of the balsam of copaiba. When the inflammation has entirely subsided and the parts become healed, the fold or folds of membrane should be snipped off with scissors.

Internal hæmorrhoids are far more serious in their consequences than those situated externally. They are generally accompanied by more or less profuse hæmorrhage upon each movement of the bowels, a sensation of weight and uneasiness at the seat, and efforts at stool followed by acute pain lasting from half an hour to two or three hours. At each visit to the closet the piles are extruded. At first they are easily returned, and remain within the sphincter until the next act of defecation, but in the progress of time they descend whenever the subject stands or takes walking exercise. In addition to these symptoms there is pain in the back, frequently accompanied by irritability of the bladder and profuse leucorrhœa. In a large majority of cases the mucous membrane covering the tumors will be found to be much thickened, granular, and ulcerated, the pile looking not unlike a ripe strawberry. Under other circumstances the membrane is smooth and of a purple color.

Treatment.—The smooth unulcerated pile is best removed by the wire-écraseur. If the wire be tightened slowly, there will be no hæmorrhage attending the operation and little after-pain. The ligature, which is commonly used, is slower in its operation, attended with a great deal of pain and discomfort, and by no means free from danger. After two or three days of suffering the ligatures separate and leave the parts in the same condition as left by the écraseur after an almost painless operation, lasting but a few minutes.

Granular, soft, bleeding piles I remove by the use of fuming nitric acid, which is perfectly safe and effective, and, if carefully applied, painless, or nearly so.

The method of application is as follows: The patient, having been placed on her left side, with the knees flexed upon the abdomen, is made to strain until the piles protrude through the anus, and their surface is then wiped dry with a piece of patent lint and the surrounding healthy tissue smeared with castor-oil. The acid is then to be applied thoroughly by a glass-rod or a piece of candle-wick, after which the parts should be washed with a solution of the carbonate of soda, covered with oil, and returned within the sphincter. Three to four applications, about one week apart, will generally effect a complete cure, even in severe cases.

There is one great advantage in this method of treatment, inasmuch as it does not necessitate the confinement of the patient to bed or to the house.

In some cases the hæmorrhoids are situated too high up to be extruded during an ordinary act of defecation. In such cases the examination must be made with the speculum, the patient having first been ætherized. The anæsthetic is necessary to completely relax the sphincter and afford an opportunity for examining the upper as well as lower part of the rectum. I prefer the speculum used by Professor Van Buren, of New York, to any other. It is a modification of Sims's, and is represented in Plate 17, as are all the instruments required in these operations.

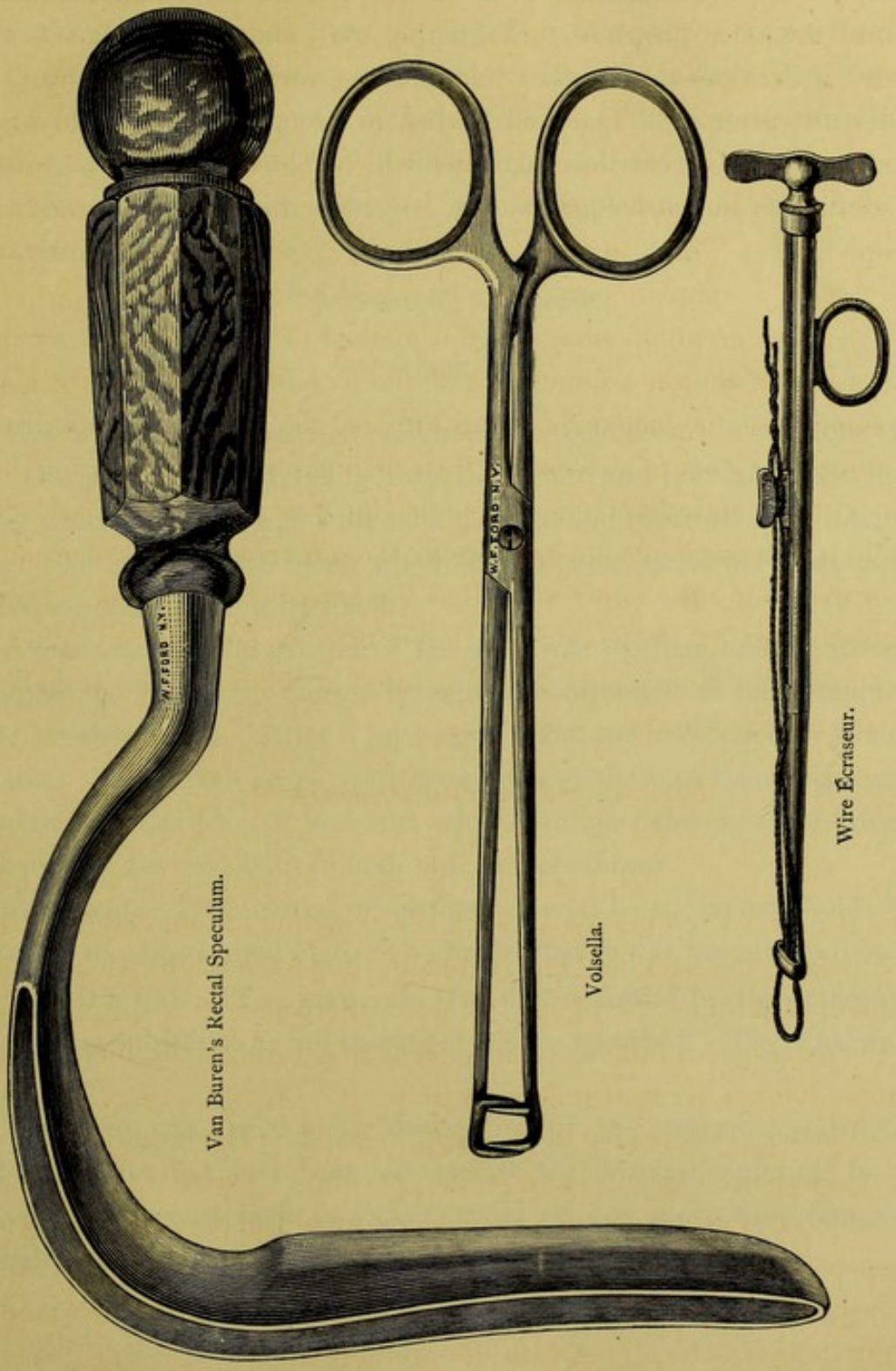
External and Internal Hæmorrhoids.

Case 1.

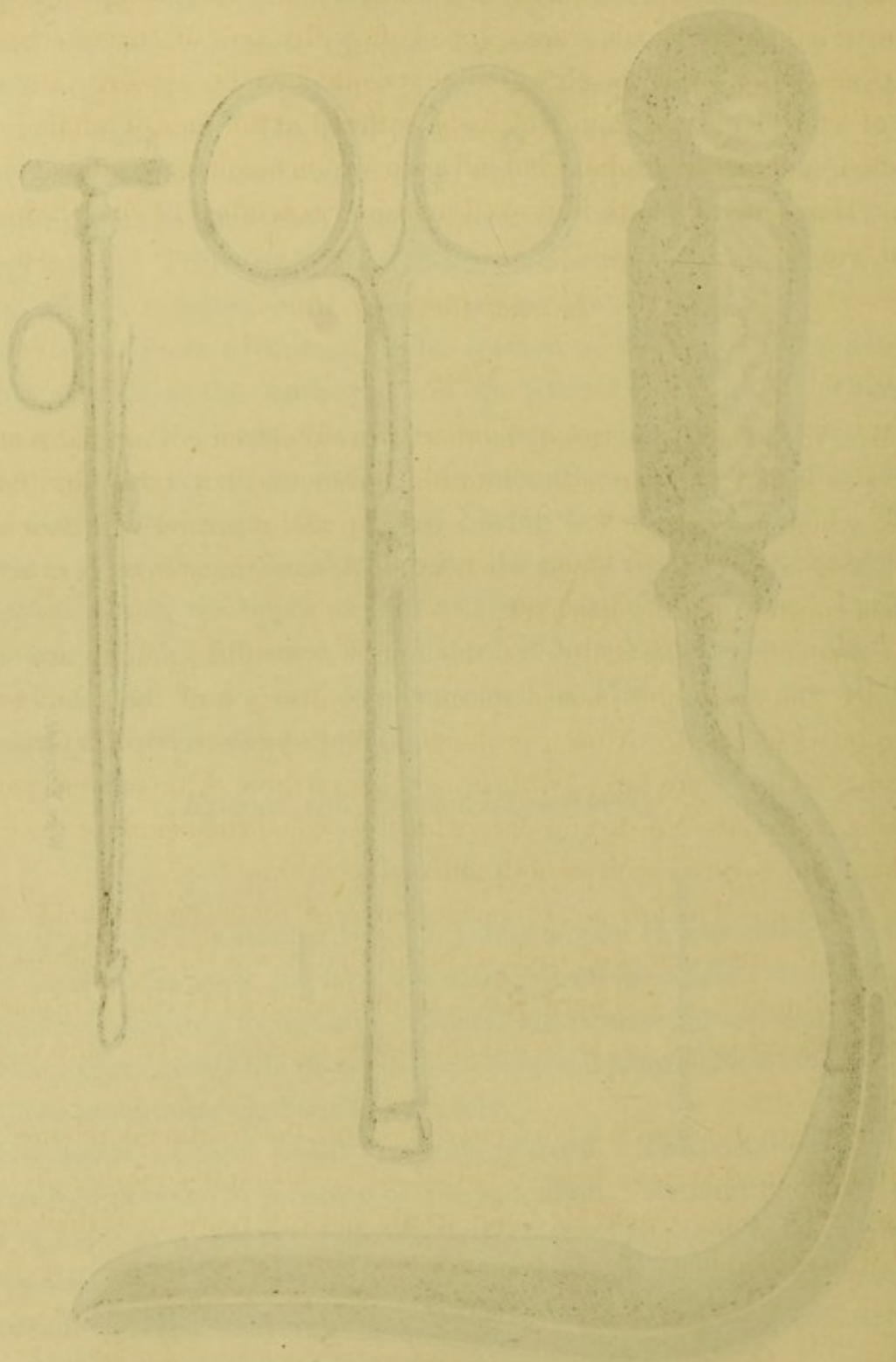
Mrs. B.; aged 32; admitted July 12, 1869; mother of four children; complains of pain in the back and hips, extending down the thighs; leucorrhœa, and frequent disposition to urinate. Marital intercourse caused considerable pain. She experiences little or no inconvenience during defecation, but for two or three hours afterward suffers severely.

Examination.—Uterus healthy, vagina relaxed. The posterior wall was too irritable to permit the pressure of the speculum. Around the anus was a fringe of loose skin, (external hæmorrhoids,) that had previously been subject to repeated attacks of acute inflammation. A slight straining effort caused the extrusion of five internal piles, three of them quite large and covered by florid granulations, which bled with the slightest touch.

Treatment.—Nitric acid was freely applied to every portion of the internal piles, completely destroying their granular surfaces. The excess of acid having been neutralized by a solution of soda, they were smeared with bella-



Instruments required for operations in and about the rectum.



donna-ointment and returned within the sphincter. This application was repeated three times at intervals of one week, effecting their complete removal. The external hæmorrhoids were snipped off with a pair of curved scissors.

Commentary.—The result was all that could have been desired, the symptoms of uterine disease from which she suffered at the time of admission disappeared, and she was relieved of all pain or inconvenience after going to stool. Her general health improved, and on September 17 she left the institution, cured.

Internal Hæmorrhoids.

Case 2.

Mrs. V.; aged 37; married; mother of two children. Complains of varicose veins in left leg, extending into the groin and left labia, and hæmorrhoids, which are extruded with each passage and returned with much difficulty. She always loses blood when at stool, sometimes in large quantities, and has constant pain in her back.

Examination.—The margin of the anus was swollen, and an attempt to introduce the speculum caused spasmodic contraction of the sphincter and had to be abandoned. After a prolonged effort she succeeded in forcing the piles out. They were large, with broad bases; three of them were soft and granular, as in Case No. 1, and one, which occupied the center of the group, was hard and covered with smooth mucous membrane.

Treatment.—The amount of surface covered by the hæmorrhoids was so great and the attachment of each so broad that it was thought advisable to treat one at a time. The hard pile was first removed by the écraseur, and the soft ones subjected to the treatment before specified. The cure was perfect.

These two cases give a fair description of the treatment pursued with all the patients that have been admitted to the hospital suffering from this disease. To report each in detail would occupy more time than can be devoted to the subject.

Procidentia recti.

Case 1.

Mrs. H. E——; aged forty-four; admitted November 8, 1868; mother of eight children, the youngest three years of age. Since the birth of the last child, she has suffered from prolapsus of the rectum. At first it only appeared when she went to stool, but for the last two years the bowel protruded whenever she assumed the erect position, and was with difficulty returned. Medication has been faithfully tried, and, failing to relieve her, she seeks admission to the hospital with the view of submitting to an operation for a radical cure.

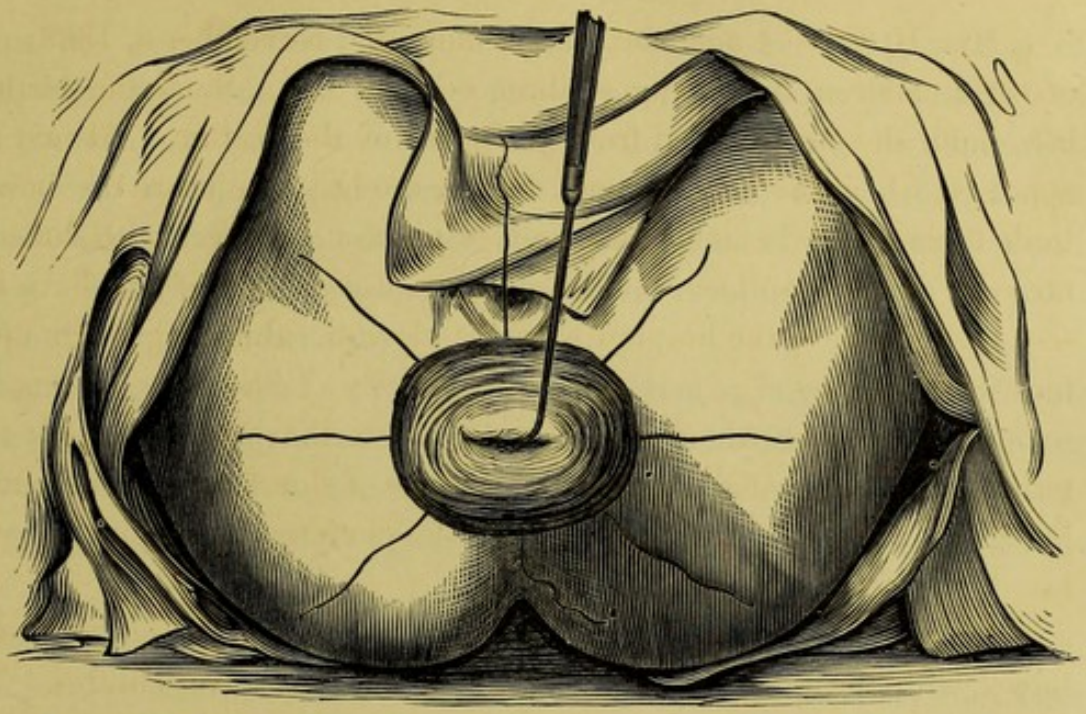
Examination.—About five inches of the rectum was prolapsed; the posterior portion presented more the appearance of skin than mucous membrane, being dry and scaly from contact with the clothing; the sphincters were relaxed; the perineum was entirely gone.

Treatment.—It was decided to amputate the prolapsed portion of the bowel with the écraseur and secure the edges by silver sutures. The patient having been placed under æther, a strong, straight needle was armed with a medium-size silver wire, and the tumor transfixed at its base by eight wires. Fig. 1, Plate 18, is from a drawing taken at the time. The prolapsed portion was then removed, the chain having been made to cut slowly, and but a few drops of blood were lost. Fig. 2, Plate 18, shows the stump with the wires in position; one wire has been drawn up in the center ready to be divided, one has been already severed and both ends twisted.

Her recovery was perfect, and in six weeks from the date of the operation the perineum was restored. No return of the disease in this case had occurred prior to June, 1872, the date at which I last saw the patient.

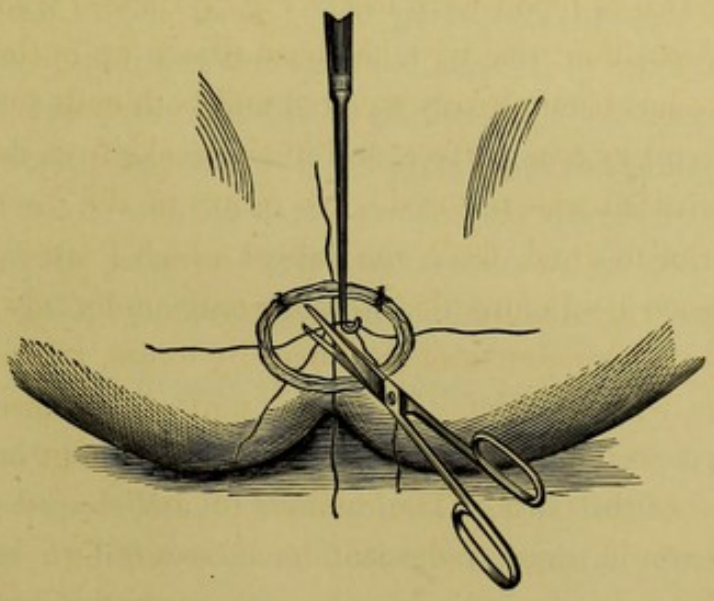
Commentary.—Before this woman came under my care she had been submitted to a long course of treatment by tonics, astringents, and mechanical supports, without relief. The upper part of the bowel appeared healthy, the extruded portion could be dispensed with without any interference with the function of the parts. The removal of a V-shaped piece anteriorly and posteriorly would, in my judgment, have been of little use. To effect a cure the operation must be radical, and, as no contra-indication presented itself, I resolved to assume the responsibility.

Fig. 1.



Prolapsus of the rectum; wires in position previous to amputation of the prolapsed portion.

Fig. 2.



Sketch of parts after amputation.



Prolapsus recti.

CASE 2.

Mrs. A——; aged forty-five; admitted August 11, 1871; mother of five children, the youngest eight years of age; complains of inability to control the action of her bowels; fluid matter flows from her involuntarily. Upon walking or standing any length of time the bowel protrudes, and in order to retain it within the sphincter, she is compelled to wear a napkin and compress. The general appearance of the patient is unhealthy, lips are pale, skin sallow, and muscles flabby.

Examination revealed a prolapse of the rectum as large as a fœtal head at full term; mucous membrane pale, but otherwise healthy. The sphincter was relaxed sufficiently to admit three or four fingers readily, and, as soon as the bowel was returned, it again protruded, the sphincter offering no resistance.

The patient was placed upon chalybeate tonics, astringent injections, and the local application of electricity. Some benefit was derived from these combined remedies, but it was not sufficiently pronounced to be satisfactory to myself or to the patient, and I decided to remove two V-shaped sections, including the margin of the skin with the mucous membrane.

The incisions were made through the sphincter, sections of which were sacrificed with the rest of the tissue. The parts were brought together by silver sutures, which were inserted deeply and allowed to remain one month. Upon their removal, union was found to be perfect. This patient experienced no further trouble during her stay at the hospital, but the prolapse will probably return, for I have seen no case permanently cured by this form of operation. If she again presents herself for treatment, on account of a return of the disease, I shall perform the same operation as in Case No. 1.

Fissure of the Rectum.

This exceedingly painful and not uncommon affection is frequently found in women who are supposed to be suffering from uterine disease. It is almost always accompanied by leucorrhœa and other symptoms so generally attendant upon affections of the uterus that without great care a mistake in diagonis may easily be made. A lady came to me from Arkansas with the following history: "Three years ago I gave birth to my first child, and from that time to the present have not enjoyed one day's health. I have constant

pain in the back and loins, leucorrhœa, and a sensation of bearing-down, as if my womb would come out. I went to New York and was operated upon for restoration of the perineum, it having been ruptured; I staid there seven months, when I left; felt no better, but was told I was cured, and that my pains and aches would disappear in a short time; but it is eighteen months since then, and instead of being better I am worse." I examined her carefully and found the uterus healthy and in a normal position, vagina somewhat relaxed, and containing an excess of mucus, unmixed with pus; the perineum had been perfectly restored. There was nothing about the genito-urinary organs to account for the woman's distress. An attempt to pass the finger into the rectum caused spasmodic contraction of the sphincter, which at once excited suspicion of a fissure. She was placed under the influence of æther, and upon examination I found a fissure on the left side of the anus with a small but deep ulceration. This at once explained the whole case and why the previous treatment had failed to relieve her.

This is by no means an isolated case. Large numbers of women contract uterine derangement as a secondary affection, disease of the rectum being the primary disorder; and others again are supposed to suffer from disease of the womb, when the seat of the trouble is entirely within the rectum. The contiguity of the uterus and rectum, and the intimate connection between their vascular and nervous supply, while affording a sufficient explanation of their close mutual sympathy, also suggests what clinical observation still more powerfully indicates: the necessity of examining the state both of the rectum and uterus, particularly when, in disorders of the latter, no adequate cause can be discovered in the viscus itself to explain their presence.

There have been fifteen cases of fissure of the anus treated in the hospital, some complicated with disease of the uterus, eleven of long standing, and in each of these cases there has been more or less ulceration.

The indication has been the same in all, viz, to paralyze the sphincter by dilatation, and touch the ulcerated surface with the acid nitrate of mercury.

To paralyze the sphincter, I adopt the plan recommended by Professor Van Buren, of New York. The patient having been fully ætherized and placed in the position for lithotomy, the thumbs should be inserted into the rectum beyond the internal fibres of the sphincter and pressed forcibly outward until they touch the tuber ischi on either side. The operation will tire the thumbs,

but it will paralyze the muscle and keep it perfectly quiet for ten to fourteen days, which will afford abundant time for the fissure to heal.

I very much prefer this plan to dividing the muscle by the knife, which is generally adopted, for the following reasons: First, permanent paralysis does not uncommonly result from division by the knife; it never does by dilatation. Secondly, if any of the fibres are ruptured in dilatation they are protected by the mucous membrane from contact with the air or fæcal matter, and no additional sore is made. All the cases that have been treated by this method in the hospital and in my private practice have been cured.

Fistula in Ano.

Eleven cases of fistula in ano have been operated upon, eight by the knife, and three, which were situated high up in the rectum, by passing wire through the track and twisting it daily until it cut its way out. All were cured.

The last is a tedious and painful operation, and should never be resorted to unless the openings are too high up in the bowel for the knife to be used with safety. Some practitioners recommend injecting the fistulous track with a strong tincture of iodine or a solution of the persulphate of iron. I think both objectionable, for the reason that they are tedious, very painful, and attended with much more risk than the knife, the injection frequently escaping into the cellular tissue and exciting inflammation, abscesses, &c.

During the six years which this report covers there have been over seven hundred operations performed in this hospital, including those which have been operated upon at the clinics.

There have been but four deaths as the direct result of surgical interference. Two of these were from acute peritonitis, following the removal of ovarian tumors. Two from surgical fever, one after amputation at the knee-joint and the other following removal of the breast.

The two cases of ovariotomy would have been reported in detail, but the book containing their record has been mislaid.

APPENDIX

CONTAINING

REPORTS FROM THE DISPENSARY

CONNECTED WITH

THE HOSPITAL.

DEPARTMENT

OF

THE DISEASES OF WOMEN.

BY

F. A. ASHFORD, M. D.

REPORT OF SECTION "DISEASES OF FEMALES" AT COLUMBIA HOSPITAL DISPENSARY.

By F. A. Ashford, M. D.,

(*In charge of section, Assistant Surgeon of Hospital.*)

Dr. J. H. Thompson, *Surgeon-in-Chief of Columbia Hospital.*

Dear Sir: In submitting my statement of the diseases treated by me in the dispensary attached to Columbia Hospital, I have to regret that in so many instances both the antecedent and subsequent histories of the cases are imperfect. This defect arises from the ignorance of many of the patients, and sometimes from their reluctance to give a true account of themselves, as well as from the frequent impossibility of following out a treatment to its completion.

Of some of the more interesting groups a tolerably accurate account has been kept, as much pains have been taken to pursue the patients even to their own homes, so as to determine results.

It has been noted in this dispensary, and I think it must be so in most others, that patients, as soon as they begin to improve, discontinue their visits to the dispensary, and the result is that the benefits of treatment are frequently unknown; moreover, some may grow ill, so that they cannot report, and then fall into other hands; or the same thing may occur when they are dissatisfied with the treatment.

The following table will exhibit a condensed synopsis of the cases presented to me since 1869, embracing an aggregate of 1,600. Of these, about 600 were miscellaneous, and were received for treatment before the service was divided in any special manner. The balance have been assigned to me, and all belong to the class usually denominated "Diseases peculiar to Women," and I may well therefore begin their presentation under the aphorism *Uterum mulier est.*

Table of diseases and number of cases treated at the Columbia Hospital Dispensary.

SECTION, DISEASES OF FEMALES.

Diseases.	No. of cases.	Remarks.
Metritis { Acute 2 / Chronic 25	27	See page 252.
Endometritis { Acute 22 / Chronic 178	200	See page 288.
Parametritis	12	Will be treated of in a future report.
Perimetritis	4	Will be treated of in a future report.
Ulceration of vaginal cervix	22	The granular ulcer not included, as it belongs to endometritis, above mentioned. Follicular variety, 10; true inflammatory ulcer, 8; with everted mucous membrane, 3; syphilitic ulcer, 1.
Erosion of vaginal cervix	41	Cases of simple erosion of the vaginal cervix.
Cancer of uterus	10	Sent to hospital.
Polypus of uterus	5	All removed by twisting or by the écraseur. One from cervical canal at fifth month of gestation, to prevent threatened abortion; symptoms were immediately relieved, and patient was safely delivered at full term.
Fibrous tumor of uterus	78	Will be treated of in a future report.
Prolapsus of uterus	8	Cases resulting from the above-mentioned conditions not included. Sent into hospital for radical cure, 3; relieved by pessary, 5.
Anteversion of uterus	8	Cases of version resulting from neoplasms or inflammatory enlargements are not included.
Anteflexion of uterus	12	One of these complicated with atresia of the cervical canal at the place of flexure.
Retroversion of uterus	9	One complicated with three-months pregnancy; uterus was re-posed without interfering with gestation; 6 relieved by wearing the closed-lever pessary; 2 were unrelieved, as adhesions existed.
Retroflexion of uterus	17	Amputation of the elongated and strictured cervix relieved two cases. Much relief of dysmenorrhœa was experienced by use of closed-lever pessary. Never resorted to any form of stem-pessary, but have used sponge-tents with benefit. Sterility existed in all, but 2 have borne children since treatment—1 after amputation of cervix, and one after use of sponge-tents, and while wearing a pessary.
Inversion of the uterus	1	Caused by traction on the cord. Metrorrhagia continued for three weeks before she came under observation, when the organ was reverted by taxis.
Hæmatocele, (pelvic)	3	One was peritoneal, two were sub-peritoneal. Resorption took place in the first and in one of the latter cases.
Amenorrhœa	52	In 22, phthisis was present, and they were referred to section on heart and lungs. In 4, atrophy of uterus was present; in 7 chlorosis existed; in 3, disease of the ovaries; in 1, Bright's disease; in 5, malarial toxæmia; in 6, sedation, (Hodge;) and in 4 it was attributed to exposure to cold.
Suppressio mensium	78	Not including any connected with inflammatory conditions already mentioned. 43 due to cold, merely temporary; 35 proved to be pregnant.
Dysmenorrhœa { Neuralgic 6 / Congestive 4 / Membranous 2 / Stricture of cervical canal 13	25	In the neuralgic sometimes relief followed alterative treatment, but it is not known whether it was permanent.
Menorrhagia	12	Nearly all cases in which menorrhagia was present have been included with some of the above-mentioned diseases of the uterus. Those enumerated here depended upon some disorder of the blood or its circulation, viz: purpura, malaria, engorgement of the liver, heart-disease, &c.
Metrorrhagia	15	What is said of menorrhagia applies also to metrorrhagia, but in 6 of the 15 hemorrhage was due to retained placenta. (2 after labor at full term, 4 and 6 weeks respectively, and 4 after abortions, 1, 2, 3, and 7 months.)
Vicarious menstruations	7	Will be treated of in a future report.
Leucorrhœa	68	Most of these were cases of simple congestive vaginal leucorrhœa, due to cold, disordered menstruation, gestation, excessive coitus, &c. Uterine leucorrhœa, being always symptomatic, is not separated from the primary affection.

Table of diseases, &c., treated at the Columbia Hospital Dispensary, &c.—Continued.

Diseases.	No. of cases.	Remarks.
Vaginitis	45	13 were simple, chiefly produced by irritating injections; 4 were granular, existing with pregnancy; 28 were gonorrhœal.
Vaginismus	2	One caused by fissure of the vulva; the other case seemed only dependent upon a general nervous irritability. The first was cured by healing the fissure, the second failed to report after a time.
Atresia vaginæ	2	Sent into hospital for operation.
Prolapsus vaginæ { Vesico-vaginal 2; Recto-vaginal 4 }	6	Sent into hospital for operation.
Fistula { Recto-vaginal 1; Vesico-vaginal 2; Vesico-uterine 1 }	4	Sent into hospital for operation.
Ruptured perinæum	12	Eight sent into hospital for operation. Four cases restored by operation at the homes of the patients.
Pudendal hæmatocele	4	In 3 it was produced by a kick, in one by a fall. Resorption took place in 2 and suppuration in the other cases. All resulted favorably.
Pruritus vulvæ	28	These were due to eczema, prurigo, parasites, a few to undetermined nervous affections, and two were connected with diabetes mellitus. (When dependent upon diseases already mentioned, as endometritis, &c., they were excluded from this table.)
Vulvitis { Purulent 14; Follicular 24 }	38	29 were relieved; 9, result unknown.
Inflammation of vulvo-vaginal gland	7	All suppurated; 5 were lanced; 2 opened spontaneously.
Caruncle urethræ	12	6 were admitted to the hospital for operation; the others were cured by removal with scissors and cauterizing the surfaces with nitric acid.
Calculus of bladder	1	The stone, weighing two and one-half drachms, was removed per urethra after dilating with sponge-tents.
Ovarian dropsy	2	Sent into hospital for operation.
Ovaritis { Acute 3; Chronic 2 }	5	{ The symptoms pointed to such a condition, but had no opportunity to confirm diagnosis; 4 followed criminal abortion.
Ovarian hernia, inguinal	2	Truss prevented descent of one; the other seemed adherent, could not reduce by taxis, and at each menstrual period the tumor enlarged, and sometimes it was threatened with inflammatory destruction.
Salpingitis, (right)	1	Abscess formed in the tube and had opened through the uterine cavity. The tube was left patulous. (Recovery.) (Case was published in the National Medical Journal, District of Columbia.)
Femoral hernia	5	Reduced by taxis.
Ventral hernia	8	Relieved by truss.
Abscess of breast	22	Most all had suppurated before entering.
Gallactocele	12	9 resulted from sudden cessation of nursing, and were easily resolved. 3 were freely incised; strapping with belladonna-plaster was found very efficient.
Gallactorrhœa	1	The flow had continued three years. Gave tonics and belladonna; patient failed to return.
Ulcerated nipples	20	A fine point of nitrate of silver was found very effective for their cure.
Neoplasms of the breast	33	17 sent to hospital for removal, 8 of which were cancerous. The rest failed to return for radical treatment.
Albuminuria of pregnancy	5	These were patients who could not enter the hospital for treatment. All improved under dispensary-attendance. Convulsions occurred in but one, prompt delivery was resorted to, and both mother and child survived.
Sterility	22	Leaving out conditions already mentioned, (such as metritis, endometritis, displacements, flexions, neoplasmata, atresia of cervical canal or of vagina, vaginismus, &c.,) and of the 22 cases here reported, the conoid cervix (Sims) was present in 19 cases. Most of these were lost sight of, and the treatment is therefore without known results. But one became pregnant, so far as ascertained, and that was after a long use of sponge-tents and the bi-lateral operation. Is not the conical cervix less a cause of sterility than the result of a want of development in the generative organs especially affecting the ovaries?
Total	1013	
Miscellaneous	599	
Aggregate	1612	

Of the cases in the preceding schedule I shall eliminate a few groups which seem to be the chief subjects of special study to the gynæcologist, and will not bring to your particular notice the large class ranged under a nomenclature too often founded upon a symptom, which, while it may to a certain extent characterize a disease, does not give a true idea of its real pathological nature. For instance, amenorrhœa cannot be considered a disease, but is a symptom of some morbid lesion, or unnatural condition, or of some functional disturbance. The same may be said of leucorrhœa and other symptoms which always depend upon a diseased condition of some organic tissue, or to a general dyscrasia or diathesis.

ARTICLE I.

METRITIS.

Inflammation of the womb, (and I refer solely to the *non-puerperal*,) considered as involving the entire tissues of the uterus proper, is, happily, far from being a common affection, although there are some who reckon it as of frequent occurrence; but I am convinced, both from my service in the hospital and dispensary, as well as from the experience of my private practice, that what many in general terms call metritis is really *endometritis*, and very frequently merely *endocervicitis*. However, I am free to admit that an inflamed condition of the mucous lining of the uterus often does involve more or less of the parenchyma of the organ in its morbid action; just as, in urethritis, we sometimes find the submucous areolar tissue partaking considerably of inflammatory changes.

For convenience of illustration, as well as because it is the received nomenclature of most authors who have of late written of gynæcology, I have embraced my cases of inflammation of the womb, whether acute or chronic, partial or diffused, under the following divisions:

Acute metritis, as expressing acute inflammation of the parenchyma of the uterus;

Chronic metritis, as a chronic inflammation of the parenchyma, in whole or in part;

Acute endometritis, as an acute inflammation of the mucous lining of the uterus, subdivided as *corporeal*, when involving only that portion above the internal os uteri, or as *cervical*, when limited to the lining of the cervical cavity; and

Chronic endometritis, when there exists a chronic inflammation of this same mucous lining of the womb subject to similar limitations as the acute. Nevertheless I am aware that such a definite division is much more strictly anatomical than justly pathological.

Especially in acute cases do I find the lesions affecting one set of tissues extending to and ravaging others. For instance, I cannot conceive how a cervical metritis can fail, if acute in its character, to affect the adejacent tissues of the uterus—indeed on several occasions I have noted a very rapid extension of inflammation from the posterior lip of the neck, along the posterior wall and body of the uterus—involving the entire parenchyma of that portion of the organ, and depositing its usual morbid products, even to its fundus.

Then, again, I have frequently detected morbific changes in the uterine tissue which at first were confined to the mucous lining. This, however, is no more than should be expected, since the same general laws of inflammatory action prevail over the womb as over other tissues, influenced, of course, by its own peculiar structure, and often fostered by its functional activities as well as by its abuses.

The relation which bronchitis bears to pneumonitis is a fit illustration of that of endometritis to metritis; and as we sometimes find pneumonia complicating bronchitis, so inflammation of the uterus may result from inflammation of its lining membrane. It may be pertinently remarked, that there exists also a striking resemblance in the rarity of such an extension of inflammatory action; as in the lung its mucous membrane seldom conveys inflammatory disease to its substance, so in the uterus do we find the same immunity of its parenchyma in inflammation of its lining membrane.

But two cases of acute metritis have been treated from the dispensary, and both were the results of attempts to produce abortion by the use of instruments.

The first was a white girl, seventeen years of age, who, believing herself pregnant, at first resorted to all the "forcing medicines," she could hear of, and finally submitted herself to an operation at the hands of some abortionist. The fact is, she was not pregnant; and when she came to the dispensary, on account of her extreme suffering, the cervix was terribly lacerated; uterus somewhat enlarged; exquisitely tender; vagina hot, and

covered with an offensive sanguineo-purulent discharge; bowels constipated; fœcal evacuations very painful, as was also the passage of urine, with a frequent desire to micturate; much nausea; breasts painful; and fainting at times. There had been no hemorrhage, nor was there any afterward, so that no fœtus could have escaped, especially as she thought herself five months advanced, and I feel assured she told the truth, for it was a long time afterward before she would be convinced that she was not still pregnant.

The amount of febrile action was very slight, compared with the severe local symptoms, and entirely different from that which usually attends puerperal metritis. She refused to enter the hospital, and I ordered her home, enjoining upon her mother the necessity of absolute rest, and advised her to procure immediate medical aid. The next day I was summoned to her bedside and found her sufferings extreme, with occasional rigors, which suggested that purulent formation had supervened in some portion of the inflamed organ. Passing my index-finger gently to the cervix, I noticed that the posterior lip was much more swollen than on the previous day—the enlargement extending upward, giving the impression that there was an abscess of the posterior cervical wall, probably extending into the uterine body—but I could not appreciate any fluctuation sufficiently definite to warrant a puncture. Ordered opium and belladonna suppositories for the rectum, and frequent and large injections of hot water into the vagina. I had directed that a dozen leeches be applied about the perineum on the day previous, but this had not been complied with.

On the following morning patient was more comfortable; pulse one hundred and twenty. She had been restless all night, and the rectal and vaginal tenesmus was very annoying.

Drew off two pints of urine through the catheter, and then managed to introduce a Sims' speculum, and, on account of the distended and engorged posterior lip, I determined to pass a sharp-pointed bistoury into the enlarged mass. It was entered just posterior to the os, and, after passing about three-fourths of an inch, pus gushed out. It discharged about two ounces of grumous matter, mixed with quite a free hemorrhage from the incised puncture, for, when I discovered that it contained pus, the puncture was converted into an incision as the blade was withdrawn. The hemorrhage in all amounted to about four ounces, when it almost ceased, and I plugged the

vagina lightly and left her. In the evening she suffered much from the plug, and it was withdrawn, saturated with sanious fluid, and a few small blood clots followed mixed with pus; but the bleeding did not recur. The opium and belladonna suppositories were continued so long as was necessary to relieve pain and tenesmus. After the opening of the abscess, her sufferings were greatly relieved, but the uterus was still very tender, and the rectal pain and bearing-down were the most distressing symptoms. For several days the vaginal injections of warm water and carbolic acid were used, and after that a tampon of cotton-wool soaked in carbolized glycerine (℥i to ℥iv) was introduced daily into the posterior *cul-de-sac*. She was kept in bed for six weeks, and at the end of two months resumed her household duties.

The second case was, in its causative history, about the same as in the preceding, except that this woman attempted abortion *sua manu*, and she thought gestation was about three months advanced. She was white; aged twenty years; in robust health previously; and having failed to secure the return of her menses by many of the teas, powders, pills, &c., so generally thought to be emmenagogue in their action, she resolved to "puncture the neck of the womb," as she expressed it, "so as to get rid of the obstruction." For this purpose she sharpened a piece of whalebone, and true to her intention did puncture through the anterior lip of the cervix, the instrument entering just below the cervico-vaginal attachment, and passing upward and backward through the anterior wall of the cervix into the uterine cavity.

She had visited the dispensary about two months previously, complaining that she had taken cold and that her menses were suppressed on that account; but suspecting pregnancy as the cause of her trouble and anxiety, a *placebo* was ordered, and no more was heard from her until I was requested to see her at her house, as she was too ill to visit the dispensary. I found the poor woman suffering extremely; pulse one hundred and twenty-six; skin hot and dry; great rectal and vesical tenesmus; constant bearing down; distressing nausea, but no vomiting.

The uterus seemed slightly enlarged; the cervix was very much so, especially the anterior lip, and exquisitely tender; indeed, so little pressure could she bear, that the examination was not satisfactory, and a speculum could not be used. She confessed that she had been exposed, and when her menses stopped she believed herself pregnant, and had visited the dispensary hoping to obtain some medicine that would bring her "all right;"

but as the *placebo* had no effect, she determined at any risk to produce an abortion, and finally she resorted to the use of the whalebone. As it had been two months since prescribing for her, and still no decided enlargement of the uterus could be felt, it was not possible that she could be pregnant, and this proved to be true. A dozen leeches were ordered, but only eight were applied to the perineum and around the anus. The bleeding was encouraged by cloths saturated with hot water, and quite a free depletion resulted. Suppositories of opium and belladonna were introduced every four hours into the vagina, which was hot and painful; but they seemed to have a better effect when placed in the rectum. Large injections of tepid water into the vagina gave decided relief, and were frequently called for, as was also the effervescing draught to relieve nausea.

After the fourth day the symptoms were so much ameliorated that the speculum could be used. The cervix was œdematous, turgid, and still very tender, the anterior lip being larger, but both equally sensitive to pressure. The lips of the os were pouting and slightly eroded. Just below the vagino-cervical attachment a round, pouting opening could be seen covered with sanious-pus, and a fine probe entered through this into the cervical canal about three-fourths of an inch from the external os. The anterior wall of the cervix had been entirely penetrated, and probably a portion of the posterior also.

The uterus was found slightly enlarged and very tender, especially over the pubes. It was pressed backward and fixed, the tissues around the fornix vaginæ feeling hard and unyielding, and giving anteriorly the sensation of a fibroid on the anterior uterine wall. Pulse was still rapid, with some tympanitis and nausea. A blister was spread over the hypogastrium, and the vesicated surface poulticed with flaxseed-meal. Bowels moved every other day, with enema of warm soap-suds, and the anodyne-suppositories continued, as also vaginal irrigations. After the use of the speculum could be borne, a pledget of cotton-wool saturated with glycerine was daily applied against the cervix uteri. (The use of the glycerine always promotes serous transudation and thereby depletes the minute capillaries, relieving œdema and often congestion, and causing a large watery flow from the vagina.)

After two months the uterus measured two and three-fourths inches, (from external os to fundus;) was normal in position, without tenderness,

except on pressure against the anterior wall, which remained a little enlarged, as was also the anterior lip of the cervix; but the wound had entirely healed, leaving scarcely a mark. Menstruation took place six weeks after the injury, was somewhat painful and lasted with remissions for six days, her usual period being three days.

After this she improved rapidly, and four months from commencement of the attack I could find no trace of disease, save perhaps a slight enlargement of the organ. She had been kept in bed a little over three months, and after that was allowed to go about gradually. This woman is now the mother of two children and in good health.

These two cases of acute metritis, the only ones I have ever seen, are unique as to their history, although they do not stand alone, either in pathological phenomena or in favorable results.

I can easily conceive how some practitioners have considered acute metritis not such a very rare disease, when in fact they had never met with a real example, for I know it was a question with myself whether many of the cases of endometritis were not, in truth, cases of metritis, until I was called upon to treat the two above reported. I then comprehended, better than I can describe, a catenation of symptoms, out of all proportion, more marked and severe than any I had previously met with among those patients whom I had almost regarded as affected with acute metritis.

Out of all the cases of uterine disease which I have seen, and of which I have notes more or less complete, numbering nearly 2,500, this first case is the only one in which I ever recognized an abscess in the uterine wall.

Sometimes in puerperal metritis I have been led to suspect such a condition, both from an enlargement and tenderness in some particular part of the uterus, and from a sudden subsidence of these upon the discharge of a considerable amount of pus per vagina. In those cases where a post-mortem was obtained, we usually found purulent infiltration, with, occasionally, abscesses more or less circumscribed, and in one autopsy we found that an intramural fibroid, which had been noted during labor, had undergone purulent degeneration, forming a considerable abscess.

Scanzoni mentions one case, the only one he remembers, in which the abscess supervened upon a violent metritis following a sudden suppression of the menses, and which ruptured on the 22d day into the peritoneal cavity, causing peritonitis, from which the patient died nine days after.

The abscess, about the size of a goose's egg, occupied the right superior portion of the body of the uterus, and opened through the external layer of the uterine substance and its peritoneal covering.

Churchill mentions having seen a preparation of an unimpregnated uterus which was the seat of an abscess containing an ounce of pus. Reinmann mentions an abscess of the uterus which opened externally through the abdominal walls, and Bird (Lancet, February, 1844) describes an abscess in posterior wall of uterus which opened into the rectum. Mauriceau, Van Sweeter, La Motte, and others have recorded similar examples.

My friend and beloved preceptor, Dr. Thomas Miller, furnished me with the details of an abscess in the fundus uteri which caused an inversion of the womb. He visited a negro woman in the jail of the District and found her suffering extremely, and from the vulva a large tumor protruded, which at first resembled a distended vaginal cystocele; but after a thorough examination he found that the uterus was inverted and that the fluctuating mass was an abscess in its fundus. He opened the abscess, which discharged about a half-pint of bloody pus, after which he reverted the organ, and the woman made a good recovery.

A complication which is at once recognized in the details of the second case was perimetritis; but as I shall devote another chapter to the consideration of this subject, I will have occasion to refer to its relations to metritis under that head.

The length of time these cases required for treatment, about four months each, shows not only the aptitude which the uterine tissue possesses for the continuance of an inflammatory action once begun, but also how frequently this morbid process involves other surrounding structures. A uterus which has once been the seat of any inflammatory action isexceedingly susceptible to a recurrence of this morbid process upon the slightest provocation. Again and again have I seen women who, after having been treated for metritis or endometritis, when the organ was apparently free from disease, become pregnant, and almost invariably they not only suffer much during gestation, but they are much more liable to puerperal metritis or endometritis, or to subinvolution of the uterus, than females who have never had such complaints. I do not wish to be understood that such is necessarily the case, but I do aver that this has been my experience, and the result of my observations also confirms this opinion; and when the nature of the uterine tissues and the

functional processes of gestation are considered, it would be strange if this were not the fact. There is no organ or tissue of the body that will suffer more insidiously the ravages of disease than the uterus, and even when judicious treatment has given entire relief, and the parts seem normal, yet the increased activity which supervenes upon pregnancy, often awakens a smothered spark which will burn without entire abatement until rest once more helps its extinction.

These considerations impressed me when conducting the treatment of the above cases, and impelled me to insist, nay, to command, perfect rest in bed, even when scarcely a symptom of disease remained, and when the patients themselves could not appreciate its necessity or reason. This was justified by the results subsequently witnessed in the second case. She married about six months after her recovery and soon became pregnant. Although her gestation was without any serious untoward circumstances, yet she complained more than is usual; a slight disposition to frequent febrile exacerbation; a burning, gnawing pain; much tenderness when pressure was brought to bear upon the womb; once or twice a threatening of miscarriage, as if the uterus was somewhat intolerant of its burden, and finally an extremely painful labor followed by quite a severe metro-peritonitis, the details of which are not proper to be considered here. The supervention of puerperal trouble in the two labors succeeding the primary attack, becomes of consequence, however, as relating to metritis in the non-puerperal state, especially as enforcing upon the practitioner the utmost diligence in its treatment, as well as determining his advice in questions of subsequent marriage.

In the first case, the woman has not up to this time married, and I believe she is in good health.

If treatment should end with the subsidence of the acute symptoms, little can be expected but that the womb will remain in a condition of chronic engorgement or inflammation, which in time must lead to serious pathological changes, if it does not entirely prevent its proper functional activity, both as to fecundity and menstruation. The activity of the treatment should of course be in proportion to the degree of inflammation as shown by the attendant symptoms, but perfect rest in the recumbent posture should in all cases be imperative.

Local depletion, by means of leeches to the perineum, around the anus, (especially if the posterior of the uterus be the initial seat of the inflamma-

tory action) and about the vulva, becomes a powerful adjuvant to assist in reducing and limiting the morbid action. (If leeches could be applied to the cervix I am sure it would be better still, but this often is impossible without administering an anæsthetic.) It had been directed for the first case, but compliance failed; still, in the second its use was attended with marked benefit at the time, and no doubt it exercised great influence to prevent other serious inflammatory lesions.

As to general treatment very little was attempted in either case, as it happened that both had taken a mercurial purge, which I think would usually be beneficial. It is of great importance to unload the portal circulation early in the disease, and to keep the alimentary mucous membrane actively working, but it could never be desirable to use any drastic, irritating medicines. Small doses of Rochelle salts every two or three hours will not only keep the bowels soluable, but will deplete the capillaries of the mucous alimentary tract, and go far toward relieving the rectal tenesmus, which is such a constant and distressing symptom.

After the acute symptoms disappear and it passes into the chronic form, which it did to a certain extent in both of my cases, and I ween it does so generally, then its treatment demands far different therapeutics, both local and general, and the practice in this dispensary will be fully set forth under the head of chronic metritis, which we shall now enter upon, because it follows both in practice and classification.

ARTICLE II.

CHRONIC METRITIS.

The condition variously described as *metritis, parenchymatous metritis, inflammatory engorgement, chronic parenchymatous inflammation of the uterus*, is the most usual sequence of acute metritis, whether puerperal or non-puerperal. It not unfrequently results from the invasion of acute endometritis, or a long-existing or neglected chronic endometritis, from a prolonged congestion due to a sudden suppression of the menses, from repeated or violent miscarriages, from abortions, from displacements, or from any cause that will produce a blood stasis in the uterine tissues.

The following table will show some of the causes and their relative frequency, as presented in the dispensary:

Causes of chronic metritis.

	Cases.
Abortion	9
Miscarriage	2
Suppressed menses from cold	2
Suppressed menses from fright	1
Puerperal metritis	2
Acute non-puerperal metritis	2
Retroversion from fall	1
Fibrous tumors	6
Total	25

It is thus shown that abortions claim 36 per cent. of all the cases, while fibroids also claim 24 per cent. This is true of the dispensary, but I am sure it is not of general private practice in the large cities, for abortion is by a much greater proportion the most frequent cause. It must be remembered that but few prostitutes ever visit the dispensary, nor do many of those who can possibly obtain medical attendance at home when they suffer from such criminal acts. So the above cannot be considered as a true proportion of its frequency as relates to other diseases or to the same disease from other causes. When including all my cases both in dispensary and private practice, I find that abortions and miscarriages are named as causes for chronic metritis in 60 per cent. of the whole number, and when we remember the prevalence of this appalling crime and then the violence which is inflicted upon the generative organs by the use of ecbolic medicines, the practice of the cold vaginal douche, the murderous assaults of instruments, the interruption of the most active physiological development known to the system—gestation—its unnatural sufferings, its profuse hemorrhages, its nervous shock—and then the poor self-criminated subject, often without rest or proper medical advice, and frequently, too, in the midst of want and wretchedness, it cannot be surprising that it should be followed so commonly by this most intractable and distressing affection.

The influence which fibrous bodies exert upon the walls of the uterus often disposes the organ to take on a chronic inflammation, owing to the blood stasis which they cause as well as to the constant irritation which their presence excites.

From the predisposition which the negro race exhibits for these neoplasms

of the uterus, we find that a large number of the cases of chronic metritis due to fibroids are among colored women, while, let me remark, very few of this race ever suffer from criminal abortions, such practices being comparatively uncommon among them.

Metritis from fibroids:

White	2
Colored	4
Total	6

Metritis from abortions and miscarriages:

White	8
Colored	3
Total	11

When we come to speak of fibrous tumors, we shall have occasion to refer to this subject again.

The influence of cold is not very likely to excite chronic metritis (except as a secondary affection from the much more common result of endometritis) unless it has been very injudiciously applied, as it appeared in two of the cases I report. In both instances the parties had resorted to ice-cold-water injections into the vagina during some inopportune menstrual period, that they might enjoy connubial pleasures. In each subject, judging from their histories, acute metritis resulted, although neither came to the dispensary until some time after the attack, having presented themselves on account of long-endured yet continued sufferings, and because of the resultant sterility. I have met with several cases where chronic engorgement could be traced to no other cause but suppression of menses from exposure to cold and wet, especially wet feet after skating, when the vital forces had been reduced by over exercise, excitement, menstruation, and the depressing effect of long exposure to a cold atmosphere.

The case in which fright was supposed to be the exciting cause of sudden *suppressio mensium*, resulting in chronic metritis, was not reliable in its history, and I always suspected some other cause, although I had no definite reasons for doubting the statement of this patient.

The two cases following acute puerperal metritis, exhibited much hy-

pertrophic enlargement, and in each the uterus was bound down by adhesive inflammation to the rectum, creating much intestinal and rectal trouble. Those of an acute, non-puerperal origin have already been detailed, and as treatment was continued both during and immediately following the acute attacks, a better result was obtained than can usually be expected.

The sub-involution of the uterus has been reckoned a cause, but I have never met with the fact. The arrest of involution is, in all the cases I have observed, due to some inflammatory action in the uterus itself. When chronic metritis followed, to suppose that the sub-involution was the exciting cause is to mistake cause for effect. The retrograde metamorphosis which supervenes upon labor, cannot but be subject to many conditions which may retard its action; but, so far as relates to chronic metritis, I have always found that the involution was interrupted by some primary metritis or endometritis. Where metritis (or endometritis) existed at the time of conception, not only do we sometimes witness an interruption of development, causing abortion or miscarriage, but, if happily this does not occur, we will almost certainly have an enlarged (or non-reduced) chronically inflamed uterus to treat afterward.

The distinction drawn by some writers between chronic metritis when confined to the superior segment of the uterus—*chronic corporeal metritis*—and to the same when limited to the lower portion—*chronic cervical metritis*—is not only just pathologically, but is of great utility practically; for the symptomatic complaints and complications are as different as are the means resorted to for their intelligent treatment.

When chronic metritis is thus limited to one portion of the uterus, the prognosis is greatly influenced, for, when corporeal, it is far less amenable to means of relief or cure than when it pervades only the cervical tissues.

While chronic metritis as a rule is usually connected with a previous pregnancy, yet that which affects the female who has never been impregnated, especially when from cold, I have found in all but one case was confined to the body of the uterus, and that the cervix seemed singularly exempt; while, on the contrary, after abortions, miscarriages, or parturition at full term, the cervix was constantly involved, sometimes solely, often in connection with the body.

This, more than any other condition which has presented itself at the dispensary, was a cause of sterility, and one patient after a treatment of fourteen months became pregnant in the tenth year of her married life. The

metritis was not cured but was greatly relieved, and after labor at full term the uterus remained more engorged than it ever had been, and the cervix, which before was unaffected, became hypertrophied and indurated. Here, then, was inflammation of the whole organ where before it was partial.

The following table will show this influence of pregnancy to determine the cervical inflammation:

Parts affected.	Never been pregnant.	Been pregnant.	Total.
Chronic corporeal metritis	3	3	6
Chronic cervical metritis	0	9	9
Chronic general metritis	2	8	10
Total	5	20	25

Where, therefore, the engorgement is not general, we find, among those females who have never been pregnant, that chronic inflammation in the corporeal segment of the uterus is as three to two in the cervical, but that this proportion is more than reversed where pregnancy had once existed. These cases are too few in number to predicate any general rule; and, that they may not mislead as to the special cause, I insert a synopsis which will suggest at once why such a localization might be expected:

Condition.	Cause.	No.	Total.
Chronic metritis, general	Acute puerperal	2	
	Acute non-puerperal	2	
	Miscarriage	1	
	Fibroids	5	
			10
Chronic metritis, corporeal	Suppressed menses	3	
	Fibroids	1	
	Abortion	1	
		1	
			6
Chronic metritis, cervical	Abortion	8	
	Miscarriage	1	9
Total			25

The reason why we find chronic metritis of the cervix so frequently after abortions is because injury is very often inflicted upon this portion of the

organ, and because acute cervical endometritis finds in the cervical portion of the mucous membrane a good hiding-place, subject to every exciting cause of inflammation for its extension.

Symptoms.—The symptoms of chronic metritis vary so much in different individuals that it is almost impossible to determine its existence by the statements of the patients concerning their sufferings, and frequently it is found to exist when it was scarcely suspected. I have found that the most characteristic symptoms are: pain in mammæ about the menstrual period, with darkening of the areolæ; nausea and vomiting; painful or uneasy locomotion and dull dragging pains in loins and pelvis, with uterine tenesmus; pain in defecation, in coitus, in micturition, with vesical and vaginal tenesmus and pain down the thighs. The digestive function is almost always deranged, and complaints of heart-burn, meteorism, eructation of gases, a picking pain in the præcordia, with much general nervous disturbance, often hysteria.

Headache was a distressing symptom in fourteen of the twenty-five cases, and was confined to the region of the vertex in eight. In two cases the *clou hystérique* was so violent that it caused temporary aberration of the mind and threatened violent mania. One of these at each menstrual *molimen* was seized with aphasia, generally being able to communicate her thoughts by writing, but not by speech, and sometimes suffering complete amnesia.

Menstruation was usually disordered, with cutting or gnawing pain in one or both inguinal regions from congestion of the ovaries, which sometimes lasted during the interim of the catamenial periods. The menstrual flow was generally deficient, sometimes absent for months and years, sometimes very fœtid, often acrid and accompanied with pruritus and excoriation of the vagina and vulva.

The presence or absence of a vaginal discharge depended upon the condition of the mucous lining of the cervix and body. Endometritis, partial or entire, usually prevailed, and a muco-purulent or muco-puro-sanguineous discharge was present in a large number of the cases.

As to determining the presence or localization of chronic metritis by any of the above symptoms it was found impossible, for while many of them were present in a large number of cases, yet in some but one or two could be elicited, and it was found, as will afterward appear, that endometritis and other pathological conditions of the uterus often exhibited many of the signs just noted.

True, in some, where the previous history was known and the symptoms carefully noted, a tolerably accurate diagnosis could be predicated, but such an affirmation needed physical exploration by the touch, the speculum, and the sound, to rightly locate and determine it, as much as the differentiation of affections of the lungs requires auscultation and percussion by means of the ear, the stethoscope, and pleximeter.

These physical, then, were the only pathognomonic signs we could rely upon, and a careful examination of them, aided by instruments, usually disclosed the true condition.

In chronic metritis, the enlarged, hypertrophied uterus was often felt above the pubes from half an inch to three inches; tender to deep pressure and falling forward. Sometimes the indurated hypertrophied organ was retroverted, and by pressing up the posterior vaginal *cul-de-sac* it could be raised from its bed in Douglas' pouch and be brought under the *conjoined manipulation* as so graphically described by Thomas. This method of bringing the womb between the grasp of one hand, pressing down the abdominal walls behind and above it, and the index or first two fingers of the other hand pressing against the anterior vaginal pouch, if the organ is normal in position or anteverted, or against the posterior, if retroverted, has been found of the utmost importance, and no examination can be considered thorough without it. Not only does it discover the size, shape, density, position, and sensibility of the uterus, but it at once distinguishes chronic metritis from fibrous tumors and perimetritis, and, generally from pregnancy, three conditions which might be confounded and result in serious disaster. In neither perimetritis nor pregnancy could the sound be used without great risk, nor should it be introduced unnecessarily where fibroids are present, so that this "manipulation," or uterine palpation, should always precede the introduction of the sound. I have often heard practitioners express great surprise, not to say doubt, concerning the possibility of being able to grasp or investigate the womb in this vagino-abdominal manner ; but, with care and the dexterity which practice gives, it would seem that there is but a small proportion of cases where it cannot be practical. In very fat women, or sometimes on account of great tenderness or a rigid contraction of the abdominal muscles, it may be impossible to elicit anything from such a manipulation; but rigidity or tenderness, aside from the lessons they teach, may be overcome when very desirable by anæsthetics.

The cervix was generally low in the pelvis, engorged, enlarged, hard to the touch, sometimes very tender when the uterus was raised by the finger,

and usually acute pain was evinced when the cervix was pressed upon at its posterior vaginal attachment. The cervix often felt like a hard stem, shaping out as it approached the body of the uterus. The os was small and round in the nulliparous, and gaping and oval where pregnancy had existed. In one case the cervix was immensely enlarged, pressing upon the bladder and rectum, and filled the vagina. In the three cases which had never been pregnant, and where the inflammation was chiefly corporeal, the cervix was not much altered, and with little or no tenderness, except when pressure was made so as to affect the body of the uterus. Where malposition had resulted, the point of flection between the body and neck was in each case exquisitely sensitive. By the rectum a larger surface of the posterior of the uterus could be examined, and especially useful was this method found to be when retroflexion existed, as the whole body and fundus could be thus reached by the exploring index finger.

The speculum and sound in the further investigation generally satisfied as to the nature and extent of the disease. The congestion, erosion, ulceration, or eversion of the lips of the cervix was determined by the former, and the position, size, mobility, and extent of disease by the latter. The sensation of pain which remained after exploration by the sound went far to substantiate the existence of corporeal metritis, and this tenderness of the walls of the body and fundus, with increase in the size of the womb, as measured by the probe, and with augmented weight and volume, will distinguish chronic parenchymatous inflammation from chronic endometritis, although the latter is generally present with the former and gives character to the discharge.

Often when granular erosion existed, the slightest touch with the speculum or sound caused more or less hemorrhage, and, after the use of the sound within the uterus, a few drops of blood often followed its withdrawal.

The progress of chronic metritis, when uninterrupted by treatment, is generally from bad to worse. Each menstrual *molimen* aggravates the previous condition; indeed, in some of the cases presented, the uterus seemed to become acutely inflamed at these times, and scarcely could the patient recover from one exacerbation before she was subjected to another more severe.

The increase of congestion and engorgement augmented the weight of the organ, aggravating those distressing bearing-down pains and bladder and vesical tenesmus to such a degree that life became a burden and a dread, and

the poor sufferer has, in the sincerity of her heart, exclaimed that she would rather pass through all the travail of the child-bed every month than suffer her menstrual agony. Where the flow was free, as was usually the case when fibrous tumors existed, either as a cause, coincidence, or effect, I have witnessed an aggravation of the usual symptoms it is true, but the suffering has not appeared so intense as when the flow was very slight or entirely absent—the free depletion, to some extent, mitigating the distress.

Where chronic engorgement results from neoplasms of the uterus, from diseases of the heart, liver, spleen, ovaries, fœcal tumor, or any diseases affecting the general circulation of the body or local circulation in the pelvis, then its progress is *pari passu* with these primary affections, and Scanzoni says, that when this is the case, that we rarely observe in the course of the disease the exacerbation above mentioned.

This disease does not limit itself. If the whole uterus is affected or the corporeal substance only, malpositions ensue and superadd sufferings and changes in surrounding tissues and organs. The period of the cessation of the menses then becomes a welcome one, for it usually brings some mitigation, if not relief.

Pathology.—Concerning the pathology of this affection I can offer but little. The cases speak for themselves, and they nearly *all point to inflammation* or congestion as a cause. Whether the proliferation of the connective tissue is due to *formative irritation* (Klob) or to *chronic inflammation* seems of little moment, as in this connection they would appear as convertible terms, each expressing an irritation causing an increased flow of blood to the organ and an increase of nutrition, resulting in hypertrophy. While therefore, in one sense, inflammation is regarded as a derangement of nutrition, yet even Klob does not deny "the influence of inflammatory stimulus upon formative action," and, consequently, its characteristic effects upon formation and nutrition.

In some of the above cases the circumscribed inflammation or irritation resulted in proliferation or hypertrophy of that particular portion of the uterus, and both in and outside of dispensary-service I have repeatedly seen enlargements of the posterior wall of the womb which were inflammatory or formative irritation. The cause probably of many neoplasms is found in this irritation, which stimulates to adventitious growths. Klob has shown this *quality* of formation as affecting both the external and internal condi-

tion of organs. Thus we find the shape, form, or position of an organ changed, and, when like the uterus it is hollow, the shape and size of its cavity also affected, its internal or interstitial parts being inclined to the development of growths, which change coincides with either an excess or deficiency of development and which he terms "quantitative alteration in formation."

When this alteration is "qualitative," we find it affecting the proliferation of elements, so that the new formations partake of the character of the tissues from which they spring, and where this action is perverted or deranged, then the results vary proportionately, giving, sometimes, histoid developments.

For these reasons Klob ranges the hypertrophy of the connective tissue of the uterus, whether accompanied with any increase of muscular substance or not, under the head of qualitative alterations of formative irritation, inasmuch as the natural proportion of the normal tissues constituting the uterus are thereby considerably altered. No better description of the morbid appearances can be found than that of this eminent German professor, and to insert it here cannot but be of interest to your readers:

"The condition of the parenchyma of the uterus varies according to the duration of the disease. In the first stages it is more congested and turgid, owing to the immatured condition of the newly-formed connective tissue. The longer the duration of the disease, the more is the mucous connective tissue transformed into the fibrillary variety, accompanied with contraction of tissue; the parenchyma on section appears white or of a whitish-red color, deficient in blood-vessels from compression of the capillaries by the contraction of the newly-formed connective tissue, or from partial destruction or obliteration of vessels during the growth of tissues; the firmness of the uterine substance is also increased, simulating the hardness of cartilage and creaking under the knife.

"The newly-formed tissue is chiefly composed of thin fibrils, deficient in nuclei, which cross the uterus in lines of various breadths in all directions, forming a complicated felt-like net-work and constituting the greater substance of the uterus.

"In the first stages of the disease the muscular fibres are broader and hypertrophied, but at a later period may be completely lost in the proliferation of connective tissue.

"The causes of this diffuse growth of the connective tissue must be sought for in habitual hyperæmia, and I cannot concur in that explanation which interprets the process described as chronic inflammation. It is true that inflammatory derangement of nutrition is often followed by proliferation of connective tissue, but it is impossible to conclude that from the presence of this formative irritation derangements of nutrition are produced, which are essentially of a destructive character.

"*Diffuse growth of connective tissue constitutes the so-called induration hitherto considered as a result of parenchymatous inflammation of the uterus.*

"Frequently this proliferation of connective tissue is developed after repeated deliveries in rapid succession, without any previous or existing inflammation. It also occurs in many displacements of the uterus, especially those in which venous reflux is hindered in consequence of traction of the uterine appendages. When tumors exist, especially fibrous, proliferation of connective tissue almost always coexists in the rest of the uterus.

"When the uterine cavity is distended by accumulated mucus or menstrual blood, this proliferation generally exists in the form of eccentric hypertrophy. Finally it is often combined with various tractions to which the uterus is subject, and sometimes is developed in consequence of the puerperal condition.

"From the description of this affection it is evident that the term 'infractus,' used by some gynæcolygists, is absolutely improper. For reasons mentioned, I would also advise the disuse of the term 'chronic inflammation.' In most cases the mucous membrane of the vagina participates in the chronic irritation, we frequently finding it in a state of epithelial desquamation, and even of catarrh and blennorrhœa. The peritoneal covering of the uterus is generally thickened and covered with various-shaped false membranes. The pampiniform and utero-vaginal plexuses are often in a varicose condition, and this is not only caused by the contraction of the blood-vessels, but is also frequently the consequence of the same cause which produced the diffuse growth of the above tissue."

While, doubtless, some good reasons may be interposed against the term *chronic inflammation*, yet no other has been suggested which expresses both the pathological condition and the morbid action taking place or inciting to change, so well as this term, in the sense in which it is generally used by English practitioners.

True, hypertrophy does often result from habitual hyperæmia, but so does chronic inflammation. In one case which presented itself at the dispensary since I began this report, and which is not included in the synopsis, there existed the greatest hypertrophy of the womb, I have ever witnessed, yet there was no history of either acute or chronic metritis. (Aged twenty-seven; been married ten years; menstruation, since marriage, painful and scanty, but for past two years entirely absent; uterine cavity measured four and a half inches; walls very thick and hard, the uterus feeling through the abdominal walls about the size of a pregnant womb six months advanced, but much harder.)

Here, then, we have a formative irritation resulting in the hypertrophy. What will be discovered when the uterus can be examined after death it is impossible to tell, but it assumes the characteristics of a true hypertrophy. This woman had never been pregnant, and she came to consult about the tumor, which had been increasing in size and hardness for several years.

Whether this proliferation is muscular or confined to the cellular tissue is indeterminate at present; but, from the cartilaginous hardness, I feel assured it is principally, if not entirely, of the latter.

While, therefore, chronic inflammation may not be a cause of hypertrophy in some cases, yet it seems to be so in the larger number, for generally it can be traced directly to the causes of inflammation; and the resultant engorgement, induration, or hypertrophy are not foreign to its ordinary products.

The relation of chronic metritis to malignant disease of the uterus has been traced by some observers so directly, that there would scarcely seem to be a doubt that the one may sometimes excite or be transformed into the other; certain it is, that most of the cases of *cancer uteri* which have come to my notice gave history of pre-existing chronic metritis, many of them having had acute puerperal metritis or endometritis.

Dr. E. Noeggerath, in a paper read before the New York Academy of Medicine and published in the American Journal of Obstetrics, Vol. ii, page 505, demonstrates this relation by reciting five cases where epithelioma supervened upon chronic metritis. Noticing the change which had taken place in the cervical portion since an examination made six weeks before, and which induced him, with the assistance of Drs. Jacobi and Buck, to excise the neck, he found that "the entire thickness of the vaginal neck had

been transformed in true epithelioma of the papillary or villous variety." This patient, he tells us, died about six months after, of epileptic convulsions, and the autopsy showed that the womb had "firmly healed over, and the tissues above appeared to be quite normal, nor was it possible to detect by the microscope any traces of the former malignant disease. There existed however, an excess of newly-formed connective tissue." The second case was similar in its history and nature, and, one year and eight months after the operation, was examined by Professor Veit, of Bonn, who found her condition satisfactory. The third case observed the same history, but was relieved by applications of the monochloracetic acid applied to the seat of disease. The other two were cured, apparently, by removal of the cervix. All five cases are detailed in full, and the writer closes his clear and succinct article with these words: "Diffused interstitial metritis has a tendency to be transformed into cancroid or simple cauliflower excrescence."

The case of Mrs. B., in which I amputated the entire neck of the womb for a cervical metritis, complicated with an intractable ulceration of the mucous surface of the cervix, following laceration of the neck in labor and puerperal metritis, presented an appearance which I am sure might have in time assumed the condition represented in Dr. Noeggerath's cases. The microscopical characters I quote here from my paper on amputation of the cervix uteri, published in the National Medical Journal, vol. ii., page 399, as it seems to illustrate what might be considered an intermediate stage between chronic metritis and cauliflower excrescence.

"I here insert a brief of the microscopic appearance of a duplicate of the sections 4243 to 4248, to be seen in the Army Medical Museum, made from a portion of the amputated cervix by Dr. Schaeffer, under the direction of Dr. Woodward.

"The section is made longitudinally through the entire cervix and anterior lip. Below (on the instrument) is the external surface of the cervix; above, the internal mucous membrane. The line made by the knife in removing the part bounds the section posteriorly. The principal alteration of structure is a greatly increased development of the mucous glands around the os, making the mucous membrane send out a fungus-like growth immediately within the os. The muscular fibres deeper in, and the connective tissue surrounding them, also partake of the alteration produced by continued inflammation, but to a less extent.

"In the different parts of the field are seen numerous small blood-vessels, some cut longitudinally and others transversely. The mucous glands, where cut across, show a convoluted appearance, and the epithelium lining them has, in most instances, separated from the walls by contracting, and remains in most of the glands shown, while from others it has dropped out, leaving an irregular hole in the section.

"The specimen has been stained by carmine imbibition to show the cell-nuclei in greater contrast."

Diagnosis.—The affections and conditions of the uterus which should be carefully distinguished in making a diagnosis of chronic inflammation of the womb are para and peri inflammation, fibrous tumors, polypi, carcinoma of its lower segment, and pregnancy.

In both para and peri metritis, the fixation of the uterus, with hardness or induration of the fornix vaginæ, will always solicit a very careful investigation before the use of the sound is practiced. The presence of these conditions does not exclude the existence of chronic inflammation of the womb, but they should be discriminated before treatment is attempted.

Neoplasms of the uterus in their incipiency add greatly to the difficulties of diagnosis, and when menorrhagia or metrorrhagia exist vigilant search should be made for them. The same may be said of uterine polypi. When fibroids are sub-peritoneal, they can be recognized very early by the method of palpation already mentioned; but when intramural, their presence is not detected without great care, and sometimes it is not possible to be certain. Intra-uterine tumors, if of much size, not only dilate the cervical canal, but cause a shortening of the intra-vaginal cervix, and we do not discover that hypertrophy and hardness of this portion of the uterus which are so constantly present in inflammatory engorgement.

To differentiate between cancerous induration and that of chronic inflammation is still more difficult, but the age and the cachectic appearance of the patient, together with the extreme hardness, the nodulated feel, the character of the ulceration if any has taken place, and, when possible, a microscopical examination of some of the ulcerated tissue, will assert the probable nature of the disease.

For the benefit of the readers of your report I beg leave to insert here, as I shall not advert to cancerous diseases of the uterus at this time, a diagnostic summary which will be found in Byford's "Medical and Surgical

Diseases of Women," taken from Becquerel's "Traité Clinique des Maladies de l'Utérus." It is the most concise and truthful that I can find anywhere.

Cancer in the Scirrhous Condition.	Inflammation with Ulceration.
Cervix hard, unequal, nodulated; os not always open, sometimes wrinkled or furrowed.	Neck less hard, developed regularly in one of the lips; os always open.
Scirrhus of the neck often implicates the vagina.	The induration of the neck never extends to the vagina. Mobility of uterus complete.
Hereditary influence is often traceable.	No hereditary influence.
Touch is painless.	Touch is painful.
Discharge sometimes absent, in certain cases abundant, and consisting for the most part of albuminous serum.	Discharge constant and characterized by the presence of transparent mucus, muco-pus, or purulent mucus.
Menstruation increased, being neither more nor less painful, and passing often into the state of real hemorrhage.	Menstruation more painful, often retarded, almost always scanty.
Absence of special anemia when the vagina and body of the uterus are involved. Cancerous cachexia.	Special anemia as above described.
Progress continuous and without cessation.	Often stationary for a long time.
The pain in cancer is very sharp, intense, and lancinating, and not influenced by locomotion or movements of any kind.	Pain less severe, more dull, and perceptibly influenced by walking and other sorts of motion.
Ulcerated State.	**Chronic Inflammation and Softening.**
Developed at the critical period of life generally.	Occurs earlier in life almost always.
Preceded and accompanied by hemorrhages.	Not preceded by hemorrhages.
Severe, sharp, lancinating pain.	Pain dull and profound.
Development essentially in sharp irregularities and nodosities.	Enlargement regular and rounded, or regularly lobulated.
Adhesions to other organs as soon as ulceration is formed; immobility of the uterus.	Complete absence of adhesions to other organs. Entire mobility of the neck and body of the uterus.
The surface only slightly soft; subjacent tissue scirrhous.	Tissue of cervix not hard, and easily destroyed.
Ulceration deep, unequal, essentially irregular, with thick, elevated, and hard edges.	When ulceration exists, less deep, with tumified edges.
Always granulations.	Granulation often accompanies the other lesions.
Discharges extremely abundant, consisting of purulent and often sanguineous serum; nauseous and often fœtid odor.	Discharges less abundant, consisting of muco-pus alone, or accompanied with a little blood without odor.

Great hemorrhage from time to time, not necessarily at menstrual period.	Always hemorrhage, but often a mere prolongation of the menstrual discharge.
CANCEROUS ULCERATION.	SIMPLE ULCERATION.
Developed upon an hypertrophed and scirrhous surface.	Ulceration often on a healthy tissue or presenting the soft or hard varieties of inflammatory injection.
Ulceration deep, vast, unequal; grayish surface with thick edges, and easily bleeding.	Ulceration more superficial, the edges less developed, and more regular at the bottom; not always easily made to bleed.
Ulcerated surface hard, presenting numerous lobes and tubercles, with nodosities, and great hardness.	Nothing of the sort in chronic inflammation and ulceration.
Often great loss of substance.	Ulceration is not always accompanied with loss of substance.
Cervix and corpus uteri immovable on account of adhesions.	Neck and body always movable.
Discharges sanious, fœtid, sanguinolent, and of an insupportable and characteristic odor.	Discharge of muco-pus or purulent mucus, always less abundant.
Cancerous cachexia always present.	Special anemia.

The early period of pregnancy may generally be ascertained by the usual symptoms of this condition, but, if not well discovered, the condition of the cervix will always discriminate, as it will be shortened and softened, instead of enlarged and indurated, and, where doubt exists, time will confirm an opinion.

Treatment.—Each patient becomes a subject of special study, for not only are the circumstances and habits of each different, but so also are their temperaments, constitutions, and predispositions, and to submit all, without considering these differences, to a pre-determined rule or system of invariable practice, is simply quackery. Nevertheless there are indications which are received as pertaining to all more or less, but the ways in which these should be met must differ very considerably. It is this variety of means to secure the same result that divides the profession upon a line of treatment to be followed. There is a large class of practitioners who rely entirely upon general medication, while another class confide in a local therepeusis: some are satisfied with hygienic and dietetic advice, while there are not wanting others who resort alone to mechanical appliances. Happily, none of the great students of gynæcology of the present day adopt or sanction any such exclusive mode of treatment. As the pathology, as well as the physiology, relating to the generative organs of the female has become better understood, so also

have the management and treatment of its diseases and conditions been made to conform to rational and comprehensive systems.

Such has been the endeavor of practice in this dispensary. Carefully studying each case, investigating each by every means which modern science and art have furnished, bound to no dogma of any special school, but receiving and accepting whatever accorded with our conceptions of truth, making experience a test and reason a judge, we have endeavored to select that treatment which has been most successful in the hands of others or which seemed to offer the best means of relief and cure. In no department of medicine has the physician who is true to his trust more often to encounter ignorant and mischievous charlatanry, than in the practice of gynæcology. The whole army of pathics has reaped rich harvests of gold from this class of diseases, and, too frequently, their subjects come to us for relief when we have little to promise or to give. Let us consider for a moment the indications to be met in the treatment of chronic metritis.

Sometimes a sub-acute or temporarily acute inflammation exists at the time the patient comes under our direction, which has been excited by cold, menstruation, or some other cause. Then there is the effusion of plastic material which has been organized in the tissues of the uterus, and often also there may be ulceration more or less extended of its intra-vaginal cervix. But in almost all cases of this disease there exist certain symptoms which demand immediate relief, and nothing will more encourage after-treatment than to give an earnest of what can be done by addressing remedies for their amelioration. Nervous prostration, hyperæsthesia, nervous excitability, dyspepsia, constipation, cephalalgia, &c., although symptomatic and the results of the uterine disease, yet often they are so prominent that in one sense they are factors of the disease, and any mitigation of such symptoms will inspire confidence in the place of despondency, and hope instead of despair.

The treatment which was pursued in the above-reported cases was not all that could be desired, as in some instances it was impossible to command that rest which was deemed necessary. In most cases rest in bed is absolutely a *sine qua non* if any success is to be expected in the treatment of chronic metritis. The erect position always disposes to engorgement, and so also does the sitting posture. Any posture or position that may be assumed is aggravated by dress, as not only the whole weight of the various skirts is borne upon the hips or around the waist, when standing or walking, by a pres-

sure sufficient at least to retain them *in situ*, (and this pressure around the abdomen is just so much pressure directly down upon the pelvic viscera,) but this pressure is increased when sitting, owing to the folds of the abdomen upon the waist-bands, or, if corsets are worn, the liver, spleen, and stomach are all compressed, thereby opposing a direct barrier which retards or interrupts both the portal and vena cava circulations; and, in addition, the lower segment of the corset, being an elastic funnel-shaped article, exercises at once a compressive, cramming force upon the bowels, and of course upon the roof of the pelvis directly and of its floor indirectly. It is unfortunate that the female should be surrounded by such stays to their full, free development, and that such barriers should be drawn around them, crushing out health and happiness. The whole system of fashionable dressing in this country is founded upon principles as false as are the tastes which dictate and encourage it, and the more completely we can keep our patient beyond the influence of such a dangerous system, (which is far more pernicious in its ultimate results than the practice of compressing the feet by the Chinese,) the greater will be our success of treatment.

In bed, then, our patients escape such suicidal danger, and when exercise must come, (for even rest in bed may be continued too long) suspenders should always be worn, which will carry the weight to the shoulders, and then the abdominal and pelvic organs escape pressure.

While all that is said above relating to dress applies to every case, yet it would be detrimental to confine every patient suffering with chronic metritis to the bed. There are times, however, in the progress of treatment when rest in bed is imperative. During monthly periods, when hæmorrhage exists, while the dilation of the cervical canal by sponge-tents is being practiced, and when many other accidental conditions are present, it is clear that exertion would aggravate the disease or at least retard its treatment. When exercise is discovered to increase suffering and to intensify distress (and I have found this usually to be the case,) it is best always to insist on perfect rest, and confinement to the bed is the only sure way of obtaining it. If the patient is allowed to recline on a sofa, the injunction is too frequently disobeyed, for any sudden desire to get up is gratified, and she flits from room to room, often up and down stairs, into parlor or kitchen, and returning to her couch imagines she has taken no exercise. This is not so apt to be the case when she is undressed and in bed.

When the patient is married, sexual indulgence must be prohibited, and for this reason our hospital-patients improve faster and more effectually than those in private life.

The patient is easily convinced of this necessity of continence by the acuteness of her sufferings when it is disregarded, and will seek it by visiting friends or watering-places, and almost invariably finds some relief so long as she remains away, but, often imagining herself cured, returns to her conjugal relations only to experience the same suffering and distress. Widows, who were invalids from chronic inflammation of the womb during their wedded life, often exhibit a marked improvement of their general health, with almost entire relief of their previously painful symptoms, for the same reason. They are not cured however, for a subsequent marriage often dispels such a delusion.

The diet should be regulated according to many circumstances which will surround the patient, but, in the main, it should be simple, plain, and nutritious. Sometimes stimulants will be necessary, but generally we cannot be too particular to banish them entirely. In moments of nervous prostration or melancholia, they will be pleaded for, both by the patient and her friends; but, aside from the risk of incurring intemperance, (and there is a great tendency in this direction by such sufferers,) their benefits are only temporary, and the patient is usually worse after than before their use.

Fresh, cool air is an invaluable auxiliary to treatment in this connection. Because the patient is in bed does not preclude an abundance of fresh air. The tonic effect of this vivifying agent on the respiratory function, and, indirectly, upon the whole nervous system, is wonderful, and should be furnished, or allowed rather, without stint. The shutting out of fresh air and sun-light is one reason why confinement to bed is so pernicious to many invalids. The body can always be protected, and there should be no excuse tolerated for their exclusion, and I am convinced if all of us would personally examine into the hygienic and sanitary surroundings of our hospital-wards and private sick-rooms, we would not find their sick occupants and attendants so enervated and blighted.

The medicines which have usually been advocated in the treatment of this disease, I have often considered of doubtful benefit, so far as promoting resorption of effused material is concerned; yet if there are any which have seemed to do good, they are the iodide of potassium and the bichloride of

mercury. In a few cases, where no anemia existed, I think they have assisted this process. I have given sometimes one, sometimes the other, or both combined, administering, according to circumstances, from five to ten grains of the former and from one-twelfth to one-twentieth of a grain of the latter, three times a day, in some of the tinctures, as there might seem to be indications.

Anemia, dyspepsia, constipation, and other conditions were treated with appropriate remedies. When anemia with constipation existed, I have generally obtained the most satisfactory results from combining iron, quinia, and nux-vomica with small quantities of colocynth and rhubarb or blue-pill. For instance, I have sometimes directed the following:

℞ Quiniæ sulphatis, ℈i.
Ferri sulphatis, grs. ii
Ext. coloc. co., grs. x.
Ext. nucis vom., } ā ā grs. v.
Mass. hydrarg., }
M. ft. pil. No. x.

Sig. One morning and night until the bowels move every day, then one each morning, or one every other day p. r. n.

These ingredients being changed and the latter omitted usually altogether as appeared best.

The bromide of potassium often proved a valuable agent to check reflex phenomena, or quiet nervous excitability. When suffering is extreme, the hypodermic injection of a solution of morphia and atropia combined was used, or, when accompanied by much rectal or vaginal tenesmus, suppositories of the extracts of opium and belladonna were resorted to.

One of the most useful remedies which I have tried when dyspepsia existed with painful distension of the stomach and intestines with gas, was the hyposulphite of soda, ten grains, dissolved in a little plain water, after each meal, and repeated if necessary. But this is only palliative, and we can obtain its cure only by removing the disease of the womb (whose connection and sympathy with the stomach is so intimate) by regulating the diet, and by procuring fresh air and exercise.

It is surprising, sometimes, to find how much this disease is benefited by a change of air, scene, climate, and water. Without exception, whatever improves the nutrition exercises a favorable influence upon chronic engorgement, and this fact should induce us to build up our patients to as near a condition of good health as possible. No general depletion is ever

called for, and, in the use of alteratives, this danger attends, unless great discretion is exercised.

The medicinal qualities of the various mineral springs of our country, so rich in tonics and alteratives, and their beneficial influence in this disease, cannot for a moment be questioned. One of the above-reported cases of chronic metritis which had been under treatment in the hospital for six months with most decided benefit, visited the Iodine Springs of Virginia, and came back four months afterward, more nearly cured than any case I have ever attended. I have frequently seen patients, after a return from the sea-side, much invigorated and strengthened, and in reality much better, so far as this disease was concerned. There are iodine-springs in all parts of our country, and I am sure, if after a course of judicious treatment these were sought and the waters used perseveringly, we would not so often witness a relapse. When the chalybeates can also be obtained, either with the iodine-water or subsequently, the best results may be expected.

No system of general treatment was alone of any great benefit to the local disease in question among the dispensary-patients. By attention, however, to the general health, the use of every means that would promote digestion, assimilation, and nutrition, and by keeping the various secretory functions of the body actively employed, the patient was placed under favorable conditions which indirectly assisted local treatment.

When any signs of acute or subacute inflammation existed, the application of leeches at two or three different times, allowing a few days to intervene between each bleeding, using the hot-water injections morning and evening, and keeping the patient in bed all the time, soon relieved the active symptoms. Long-continued irrigation of the vagina and cervix with water as hot as could be borne produced a very sedative effect—and, in hospital-practice, this could easily be accomplished by a skillful nurse without much disturbance to the patient—and the effect was very decided. This cannot always be practiced satisfactorily in private families, unless good, intelligent nursing can be procured, for, if badly employed, it often annoys the patient, and then harm, rather than good, sometimes results.

This syringing or irrigation should be continued at least fifteen or twenty minutes each time, for, if hot water is used but a few moments, the first stimulating action of heat is produced, to be succeeded by congestion; but, when continued, it relieves the parts, and sedation follows.

This effect of the hot vaginal irrigation has been well advocated and attested by Dr. Emmett, of New York City, in an article published some time since.

Just as soon as the active symptoms disappeared, the cervical canal was dilated by means of sponge or laminaria tents. The result of this dilatation was twofold: it not only opened the way to intra-uterine medication, but it excited an action in the uterine walls which often exercised a favorable impress upon the effused morbid material. I know of nothing that reduces the hardness of the tissues of the uterus so quickly as the sponge-tents, and, when they are repeated of graduated sizes, commencing with the smallest that could be retained in the uterine cavity, and the dilatation continued until the finger could be introduced with ease, I have invariably found that many characteristics of chronic engorgement had disappeared, (especially the cartilaginous hardness,) and left the organ in the best possible condition to receive topical medication.

My preference has always been in favor of the sponge over the laminaria. Not only do the small tubules of the sponge ramify into the sinuosities of the mucous membrane, but imbibe from and deplete, as it were, the small mucous capillaries, besides being so much softer than the laminaria. After removal of the laminaria tent, it is found to be a hard, irregular mass, which would seem to be a most dangerous article to place within the uterus, but I have never observed any bad effects from its use. Almost always its shape is prismoid, and its edges are sharp and sometimes serrated or notched. As a dilater I think it much inferior to the sponge, but often it may be used with greater facility, and does not become so offensive, which greatly enhances its value. This last fault of the sponge was to a large extent corrected by carbolizing the sponge, as directed by Dr. Robert Ellis, American Journal Medical Sciences, vol. xlv, page 276. Shreds of cotton-wick steeped in carbolic acid are drawn through the longitudinal center of the sponge, which is then rolled or pressed into shape and covered with cocoa-butter, to which a certain quantity of glacial carbolic acid had been added. "The disinfectant properties of this agent completely protect the tents, and they are withdrawn in an inodorous state, even after a stay of twelve or eighteen hours in the cervical canal." A good extemporaneous way of making sponge-tents is recommended by Dr. Hough. The sponge is wrung as dry as it can be with the hand, and then molded by pressing it into a quill or any tube. It is then immersed in strong

alcohol, which immediately "sets" the sponge, and it preserves this form (which may be trimmed to any shape,) until moisture is applied, when it distends to its former shape and size.

In treating the cases of chronic metritis, the tents were sometimes made of sponge cut into pieces of various sizes and lengths, which, after being soaked in mucilage containing more than the officinal quantity of acacia, to which had been added carbolic acid, (f℥ss to f℥i,) were then tightly wrapped over an awl or catheter-canula with strong twine. These were not unwrapped until wanted for use. Before passing the tent into the uterine canal, it was dipped into a mixture of glycerine and carbolic acid of variable strength, to suit the indication. I never use any instrument for introducing the tent but the ordinary small uterine forceps, the cervix being exposed by means of Sims' speculum. By the forceps the tent can be made to change its direction so as to pass a point of flexion or to follow the course of the uterine canal in versions. I regard the carbolic acid and glycerine as not only ridding the sponge-tent of its most objectionable feature, but they exercise a most salutary effect upon the disease as therapeutic agents. The tents usually remained twenty-four hours, one being introduced upon the removal of the other, and, after the introduction of each, a pledget of cotton-wool, saturated with glycerine, was placed against the cervix. This not only kept the tent *in situ*, but the glycerine purifies the discharges and depletes the capillaries of the cervix and of the vagina. The use of this glycerine (or glycerine and carbolic acid) tampon was almost invariable after topical applications, and a string having been attached to the cotton before its introduction, the patient could easily withdraw it. Its benefits have been well taught by Dr. Sims.

Treating ulcers, tumors, &c., by compression of sponge externally, has been fully set forth by Drs. Batchelder and Roberts, of New York, as well as its utility in healing old sinuses, fistulas, and abscesses, when its action was applied within the cavity of the sinus. This same efficacy of use has been verified upon the diseased conditions of the uterus. The granular erosions of the mucous membrane are cured almost immediately, and the parenchymatous hardening and plastic effusion are greatly modified. Where ulceration exists, either in the cervix or body, the sponge-tent is invaluable.

Only once have I ever known the use of the tent to be followed by any deleterious result. It happened in the case of a dispensary-patient suffering profuse metrorrhagia, and she was admitted to the hospital for the purpose of

dilating the cervix, so that the cause of hæmorrhage could be ascertained. The report of this case was read before the Clinico-Pathological Society of this city, and was published in the National Medical Journal, vol. ii, page 307. That it may be properly estimated, I quote from that report:

"On September 5, (seven days after the use of the tents,) she was seized with violent pains in the lumbar region of the spine, which soon extended to the cervical portion. She was not seen by any physician until the 9th, when Dr. Ritchie was called, who immediately sent her again into the hospital.

"When she entered, she complained of much pain in the umbilical region and of oppression around the lower part of the chest. The muscles of the neck were rigid, jaws stiff, and *facies tetanica* well marked. Her symptoms increased, both in extent and severity; muscles of the abdomen became rigid as well as those of the back and arms. After a few days the lower extremities became involved, causing great pain around the pubes at the origin of the adductor-muscles of the thigh.

"The advance of the disease was gradual, positive, and sure. It seemed as if this power for the production of tonic, unyielding rigidity was generated in muscle after muscle—tightening every sinew, straining every tendon, and compacting every fibre until her death on the 15th—ten days after the first symptoms, and seventeen days after the use of the tent."*

This case of tetanus, like many others, arose from doubtful causes—whether from the deep ulcerations of the uterine parenchyma, as discovered after death, or from the irritation of the sponge-tents. In none of the cases in which it has been used, either by myself or under my observation, have I witnessed septicæmia or cellulitis, as has happened in the experience of others. After the uterine canal had been well dilated, sometimes the cases were treated by uterine injections, sometimes by applications made directly to the whole uterine cavity by means of the sponge or cotton probang.

Three cases of chronic metritis were treated by means of uterine injections or irrigations. The first important consideration was to keep the cervix well dilated, so that the injected fluid could have an easy escape. The mildness of the fluid will avail but little to avert those distressing attacks of uterine colic which I have sometimes observed. It has seemed strange that an injection of warm water could produce so much prostration

* See a similar result after use of sponge-tent, by Dr. J. H. Thompson, at page 102 of this report; also, a case of fatal metro-peritonitis, from the same cause, at page 96.

and, for a time, dangerous collapse, as occurred in the history of one of these cases. I had directed the patient to use the vaginal syringe each morning, but the first time she attempted it she evidently introduced the nozzle into the os uteri, which was open, and the result was almost disastrous. The nervous shock was alarming, and perimetritis resulted. No dilatation had been previously attempted in her case.

It has been the practice to commence the introduction of the tents three days after the catamenia ceased, and to persevere in their use until the index-finger could be passed into the cavity, which generally occupied from four to six days. Each day, after the dilatation had been completed, the uterine cavity was syringed with warm water by means of a Davidson's syringe, attached to an ordinary gum male catheter, or the long curved canula of the "Universal syringe." This washed away all the secretion and left the surface clean for the action of the tincture of iodine, either strong or diluted, the strong (Churchill's) usually being injected through the canula of Dr. Nott, (American Journal of Obstetrics, vol. ii, page 491.) It would be best, probably, to use Dr. Nott's or some similarly constructed canula* for all uterine injections, for sometimes, even when the cervical canal is dilated, any irritant that would contract the uterus might prevent the exit of the injected fluid, and serious consequences would result. It is not necessary that the *force* of the injection should be small to avert the danger to be apprehended—that a part of the injection may pass into the peritoneal cavity or into the uterine veins—for if the cavity contains fluid and its walls contract, unless some means of ready escape be provided, the whole force of the uterine contraction is upon the pent-up fluid, which seeks an opening anywhere; and if the os, either external or internal, has grasped the catheter, the contained fluid will almost certainly pass into the oviducts—perhaps into the uterine veins.

Vidal de Cassis, in 1840, published an essay setting forth some experiments upon the dead body with a view to test the aptitude of uterine injections to enter the peritoneal cavity. He found that, when the nozzle of the syringe was fastened within the neck of the uterus, forcible injection caused the fluid to enter the uterine veins and pass into the Fallopian tubes.

* I have often preserved a ready escape for the injected fluid by passing two gum-catheters into the uterine cavity; the fluid entered through one attached to the nozzle of the syringe and flowed out through the fenestra of the other.

When large injections were used with moderate force, the fluid passed through the oviducts in two instances, in six it entered the uterine blood-vessels. He practiced uterine injections to a considerable extent, and preferred the solution of nitrate of silver to iodine, recommending, however, that the uterine cavity be deterged by warm water before the caustic solution is used. Velpeau recommends uterine injections as practiced by Vidal, being assured that the injected fluid will not pass into the peritoneal cavity. In Germany, (American Journal of Obstetrics, vol. i, page 389,) says Dr. Kammerer, experimental injections on the dead body were resumed in 1862 by C. Hennig. These experiments gave the following results: that under a gradually increased pressure from injections made with a common uterine syringe, the canula being hermetically ligated to the cervix uteri, not a drop of the injected fluid penetrated either of the oviducts, the orifices of the latter only being filled to about three millimeters.

Klenn (same writer) found that the injected fluid, whenever the os was not ligated, always returned through it and never penetrated the oviducts, whether they were injected from a column of water five feet high or by means of a small syringe. Whenever the fluid penetrated the oviducts after ligation of the os, the fluid advanced slowly, an observation which is contrary to the assertion that the pains immediately follow the injections. In three cases out of eighteen, blue ink, injected through a narrow os with moderate force, penetrated the venous system of the uterus and broad ligaments without apparent laceration. To the latter circumstance is attributed the sudden appearance of metritis and peritonitis after injections. In the American Journal of Obstetrics, vol. i, page 377, is a "Historical Review of Uterine Injections," by Dr. Joseph Kammerer, of New York, which is replete with interest to any who wish to examine the views and treatment of many celebrated practitioners. I cannot, however, help questioning whether, in attributing to Hippocrates and other ancients, acquaintance with intra-uterine injections, he does not follow his classical translation too literally, for it is well understood that Hippocrates, and many writers of more recent date, speak of vaginal injections as uterine, which, to the ancients, was a comprehensive term, and not limited as at present.

The iodine was selected because it was thought to possess some qualities which do not belong to any of the other medicines commonly used as injections into the uterine cavity. The nitrate of silver was tried, but it ex-

erted no influence beyond the mucous membrane, while iodine undoubtedly penetrates with its alterative influence into the parenchyma of the organ.

Dr. Nott has shown how little the albuminous secretions are affected by the tincture of iodine, and that in its use we need not fear the formation of coagula, which close up the fenestra of the canula, or that it will combine with these secretions and be neutralized thereby, as is the case with many other agents. The strong (Churchill's) tincture was injected at intervals of five days, the uterus being syringed daily with warm water, to which Lugol's solution (one part to eight) had been added. About one pint of this mixture was passed through the uterus, and after each syringing a pledget of cotton, soaked in glycerine, was placed, so as to correct any version or flexion that existed. If retroversion or retroflexion was present, by pressing the tampon up in the posterior *cul-de-sac*, great comfort resulted. The same good effect was not so marked when the malposition was anterior, as the cotton could not be so well retained; still it was far better than a pessary.

Two or three times a week the upper portion of the vagina and intra-vaginal cervix was painted with Churchill's tincture.

Two of the three cases so treated were greatly improved; one so much so that pregnancy resulted two months after her discharge, although she had been sterile for eight years. When this last was admitted to treatment the uterus measured, by the sound, three and three-fourths inches; was retroverted; enlarged; tender to pressure; cervix eroded and indurated; muco-purulent, sometimes sanious uterine discharge; with pain in back, thighs, and hypogastrium; vesical, uterine, and rectal tenesmus, and vertex headache. She remained under treatment six months. All local treatment was omitted three days before the menstrual period and resumed three or four days after. When dismissed she did not suffer from any of her former symptoms. The uterus measured three inches, was much reduced in size, still somewhat retroverted, but considerably less so than it had been; no uterine discharge, and menstruation was without pain. The other was about similar in character and results, except as to pregnancy, as she is still a widow.

The third case so treated was benefited so long as the treatment continued, but relapsed upon its cessation. Twice have I undertaken it, but without any satisfactory results. The patient is a virgin and the corpus uteri is chiefly affected. The unsatisfactory treatment of this third case led me to omit the uterine injections and instead to use topical applications, by

means of a small sponge-probang, when the cervical canal was well dilated, or when this was partly closed, by the sound wrapped with cotton-wool, and I feel assured that this method of intra-uterine medication is much the safer.

From quite a frequent use of both methods of application, I think that in hospital-practice the uterine injections have a better effect, but the most diligent care should be exercised to avoid risk. In treating affections so chronic and indestructible of themselves, the physician has no right to expose his patient to danger, and the evidence of occasional harm or peril is quite sufficient to enforce discretion. All the rest of the cases were treated locally by the medicines upon the uterine sound, armed as above stated, or upon the probang. When the latter was used (which was immediately after dilatation) the sponge was pressed so as to squeeze out any excess of fluid, that it might not run over the vagina, for the uterus will invariably contract upon the sponge and then the fluid is forced out. A little practice soon determined the amount of saturation necessary. I have seen several cases of acute vaginitis when chromic or carbolic acid had been used, either upon the probang, the covered sound, or the applicator, by inattention to this caution

In the management of those cases where fibroids existed, the use of the sponge-tent was usually omitted. I have been able to accomplish little more than to modify the condition of the mucous membrane of the uterus and diminish the tendency to hæmorrhage; all intra-uterine applications generally did more harm than good. The engorged veins on the cervix were sometimes punctured, or a few leeches applied when menorrhagia threatened, and a comparatively slight depletion of the turgid vessels in this way often averted a much more profuse and intractable flooding. The leech-bite or the puncture can easily be reached if the bleeding becomes profuse.

Leaving out the six cases of chronic metritis with fibroids; the two following acute metritis, already detailed, and the two others, which submitted to treatment for too short a time to derive much benefit: all the others, seventeen, were very much relieved. Three of these seventeen have since borne children, while before treatment they had been sterile, one for three, one for five, and the other for ten years.

When the cervix was very much involved, the *potassa cum calce* was used, as recommended by Dr. Hughes Bennett, and its application has in each case verified his experience. Where the cervix only is the part affected and these means fail, amputation, as practiced in the case already referred

to, offers a dernier resort. I cannot represent that any of them were absolutely cured, that is, that the uterus resumed its natural conditions, but in several, and especially where the morbid action was confined to the cervix, the functions of the organ were to all appearances quite restored. Menstruation has been regular, the leucorrhœa absent, and fecundity exhibited. In most instances the patients have been discharged, suffering little, if any, with the distressing symptoms present in the beginning, but in some, success was only partial. Still the results, in the main, seem to encourage perseverance. The candor of such men as Scanzoni and Thomas is as commendable as it is consoling to other practitioners. "In treating this disease with all the necessary perseverance and foresight, we shall at least obtain a sensible amelioration in the state of our patients, if we do not succeed in obtaining for them a complete and durable cure. When we have only obtained an amelioration and entertain but little hope of cure, we should still endeavor to moderate such painful symptoms as may prove obstinate, by means of a well-directed symptomatic treatment."

ARTICLE III.

ENDOMETRITIS.

One hundred and seventy-eight cases of endometritis have been treated at my dispensary service, and in one hundred and twenty the disease has been limited to the cervical portion. Considering the frequency of this disease, its prevalence among all classes and conditions of females, and its great number of causative influences, both direct and indirect, it is of prime importance that the anatomical as well as the pathological characteristics of the tissues involved should be well understood. At the risk, therefore, of being tedious, I would invite attention to a few practical considerations relating to the construction of the mucous membrane of the uterus, embracing not only its lining membrane, but also that which covers the vaginal cervix.

Between the mucous membrane covering the external or vaginal cervix, that lining the cervical canal and that lining the uterine or corporeal cavity, a division is made which is not altogether arbitrary, but one that is almost necessitated by differences of minute anatomical structure, by variety of secretion, and by diversity of pathological changes. The mucous membrane covering the vaginal portion of the cervix—that is, all that portion embraced between the insertion of the vagina and the os tincæ—is smooth and firm and

covered, like the vagina, very abundantly with pavement or tesselated epithelium. The abundance of this epithelium-covering fills the interstices between the projecting villi beneath, and when it is removed these are discovered to be very numerous and prominent, and after disease has despoiled this portion of the uterus of its epithelial membrane, these villi or papillæ give to the cervix that granular appearance so generally known as "granular erosion." In Fig. 2, plate 12, of this report, taken from Dr. Tyler Smith's work on leucorrhœa, this prominence of the villi is well shown, but the same is often observed by the naked eye, and the papillæ look like little grains, sometimes larger than at others.

These villi are very vascular, their extremities containing a loop of vessels, which, when denuded of epithelium, bleed upon the slightest touch, and when hypertrophied and denuded, they appear so fungous as sometimes to be considered malignant. Dr. Tyler Smith contends that there are no mucous follicles in the external cervical mucous membrane, but others have seen them, and (if I can determine a mucous follicle) I think I have observed them. Tyler Smith himself does not appear to be sure, for he says: "That the appearances which might be mistaken for mucous follicles seem in fact to be nothing else than the villi more or less obscured by their epithelial covering." The secretion from this portion of mucous membrane is acid and quite tenacious, and, when the mucous follicles or crypts (from some cause) become closed, we have them distended with mucus, and in this state they have been called Nabothean ovules. This constitutes the follicular inflammation of some authors.

Within the cervical canal we find the mucous membrane more vascular; its villi considerably larger; its mucous follicles infinitely more numerous; its rugæ prominent and extensive; its epithelium of the cylindrical variety, and its secretion alkaline. Within the os uteri is generally seen a short circumference of mucous membrane, which, while it does not differ in its ultimate constitution from the rugose and fossated membrane above and lining the cervical canal, yet is not so rich in mucous follicles as the rugæ of the arbor vitæ.

The arrangement of the rugous folds and fossæ is not regular or uniform. Sometimes they can be seen at the os uteri externus and the smoother space above mentioned is absent. Even in the virgin cervix I have failed to observe any very uniform disposition of the rugæ.

Often only one well-marked longitudinal fold is discerned, and the transverse elevations and depressions stretch upward and outward at quite an acute angle, while in others the direction of these is at almost right angles. Again, in one specimen before me, the whole inner cervix presents a reticulated appearance, the depressions being deep, especially on the posterior wall.

Says Dr. Tyler Smith: "When the cavity of the cervix belonging to a virgin uterus is laid open by a longitudinal incision, so as to expose the whole of the cervical canal, the internal surface is generally found to contain four columns of rugæ or folds of mucous membrane, the rugæ being arranged in an oblique, curved, or transverse direction. Between these columns of rugæ, four longitudinal grooves or ridges are usually seen. In some specimens grooves, in others ridges, are present. Of these, the two grooves or ridges in the median line, anteriorly and posteriorly, are most distinct. The other longitudinal markings are situated, one on each side, between the anterior and posterior lips of the os uteri. The canal of the uterus is flattened in shape, and two of the rugous columns are arranged on the anterior lip, and the other two upon the posterior lip; the posterior half of the cervix being the larger of the two and containing the greater number of rugæ. The sulcus or division between the posterior rugous columns is also generally more strongly marked than the sulcus dividing the anterior rugous columns. The rugæ of each column, as seen by the eye alone, vary from about ten to fifteen in number. In the intervals between the columns, numerous small longitudinal folds may be seen; but these are less distinct than the transverse rugæ. In the healthy state, the transverse rugæ, with the fossæ between them, are covered with a viscid and transparent mucus; and when this is brushed away a reticulated appearance, caused by numbers of secondary rugæ, is visible in the mucous membrane beneath. The secondary rugæ run in various directions without much regularity. In some parts of the fossæ the mucous crypts are deeper than usual, and here and there minute openings are seen at the bottom of the pits, into which fine bristles may be passed to the distance of the twelfth of an inch or more. Besides the four rugous columns and the furrows between them, which are found in the well-developed cervix, other rugæ of irregular shape are seen, particularly at the upper and lower portions of the cervix, where the regular, transverse, or oblique rugæ become indistinct. The cervical rugæ have been

compared to a tree, a feather, or a fern-leaf; but when the whole cervix belonging to the uterus which has never been impregnated is displayed, it is not unlike an open book in miniature, printed in double columns." (See Fig. 10, page 34, Tyler Smith.)

In the infant or child, where we find the development of the cervix so much in advance of the corpus uteri, the arbor vitæ is exceedingly well marked. Often it will be found that these rugæ or folds do not assume the arborescent appearance.

After pregnancy, these rugæ are to a certain extent obliterated or blurred from the distension to which, like those of the vagina, they have been subjected; yet some are always present, and the glandular structure still remains, save such follicles as may have suffered irreparable injury. This rugous arrangement not only furnishes a larger glandular surface, but meets a demand of parturition which preserves the integrity of the mucous membrane. When a section of the virgin cervix is submitted to the microscope, we then become aware of the complicated arrangement and immense glandular apparatus of its mucous membrane, so long hidden from view. By a glance at Fig. 2, plate 14, some idea can be gained of its intricacy.

This represents only one longitudinal column, and he states that, "Besides the primary rugæ, each fossa is seen to be subdivided by smaller rugæ, from which curved septa, still more minute, take their origin, dividing the principal fossæ into a great number of crypts, arranged like a piece of fine net-work. In each of the fossæ between the primary rugæ, as many as from forty to fifty crypts or laminæ may be seen. A cervix of moderate size would show between the transverse rugæ of the four columns alone, with this low magnifying power, from two to three thousand follicular pits."

If the lens-power be increased, a vastly increased number of mucous follicles become visible, so that Dr. Smith has made an enumeration "which gives, as a moderate estimate, ten thousand mucous follicles to the membrane lining the cervical canal. If one of the longitudinal columns be divided in its long diameter, the cut section shows the depressions of the fossæ extending obliquely to a considerable depth, and occasionally mucous openings pass into the center of the walls of the cervix, and may be seen filled with the tenacious mucous proper to the cervical canal." (See Fig. 1, plate 15.

The mucous membrane lining the cervical canal is studded with villi,

in common with the os and external cervix and vagina, and the sensibility of these has been much discussed. Dr. F. Kilian considered them as sensitive in function, or rather as organs of sensibility, and consequently concluded that nervous filaments were also present, but he could not demonstrate them with the microscope. The apparent ordinary insensibility of the os and cervix he accounts for by considering them as sensitive to pleasurable but not to painful impressions. M. Jobert accounted for this obtuseness to pain in the cervix, except at its upper part, on the principle that the nerves which supplied the upper part passed from this to the vagina without distributing filaments to the rest of the cervix uteri.

While, however, the lower or vaginal portion of the cervix uteri is not ordinarily sensitive to pain, yet, in some diseased conditions, it becomes exceedingly sensitive, and, judging from the sympathetic nervous phenomena which so frequently attend its diseased condition, it would seem to enter into that general system of nervous relation which connects the uterus through the renal and hypogastric plexuses, with the cerebro-spinal and ganglionic centers. Generally speaking, says Chrobak, (Stricker,) "The neck is said to contain more nerves than the body; nervous filaments may be traced quite up to the mucous tissue, (Kilian;) on the other hand, the mucous membrane of the fundus is said to be more sensitive than any other part, (Lazarewitsch *et al.*)

There are some who claim to demonstrate nerve-filaments in the papillæ of the cervix, (Kilian, Hjalmar;) yet the real character of these so-called nerve-fibres remains in doubt.

Between the mucous membrane lining the cervix and that lining the corpus uteri there is a marked difference, and the line of demarcation is well defined. That of the neck is "tough, firmer, more transparent," and is more than twice as thick. An investment of connective tissue extends over the orificium internum quite into the corpus. It lies between the mucous and muscular layers, and is especially well marked on the posterior wall, (Rokitansky.)

The following is the most concise histological description of the mucous membrane of the uterus that I have been able to find, by Chrobak:* "In the virgin state it is from 1 to 1.8 millimeters in thickness, gray or pink, and becomes gradually thinner as it approaches the cervix and orifices of the ovi-

* Stricker, A Manual of Histology, page 608.

ducts;* no well-defined line of demarkation separates it from the underlying or muscular coat, and in fact it can only be isolated in small fragments. The surface is smooth, excepting only about the orifices of the tubes, where it presents very slight foldings, but no papillæ."†

"Again, it is covered in health with a thin layer of a more or less gray, translucent, and somewhat glutinous fluid, of slightly alkaline reaction; this contains in various and slight proportions cylindrical cells, little, roundish, granular cells, secretions from the uterine glands, occasional cilia, and very seldom intact ciliated cells, (in old people, we find, too, cholesterine, monads, algæ, free fat, &c. (Donné, Taylor, Smith, Scanzoni, Kölliker, Hennig, Schlossberger, Hausmann, *et al.*)

"The mucous membrane of the uterus has no frame-work of connective tissue. Henle claims that he has occasionally succeeded in demonstrating a fine net-work of pale fibres by penciling with a brush. This was accomplished by first treating the tissue with caustic potash.

"This frame-work really consists, however, of the uterine tubular glands, immediately to be described, between which there seems to be a mass of free nuclei from 0.006 to 0.008 millimeter in diameter, together with many elongated cells or various sorts of polyhedral or little plate-like cells, fibre-cells in the most various stages of development, a proportionately large amount of insterstitial substance, and bundles of muscular tissue reaching from the innermost layer of the muscular coat to the base of the glands."

The utricular glands "present in the human species a uniform type, though two forms are apparent in many animals." They represent, usually, single tubes of varying length; "often, however, they have one or more diverticula at or below the middle; the general shape is cylindrical, or somewhat club-shaped at the extremity, which terminates blindly; they discharge into the cavity of the uterus at the surface of the mucous membrane. Here they are apt to be compressed laterally or upon three sides, and the diameter of the orifice is greater than of the caliber in other parts.‡ They adopt most circuitous courses, and even wind spirally, like a corkscrew; thus the length of the follicles sometimes considerably exceeds the thickness of the mucous tissue. On the whole, the inclination of the tubes is vertical to the plane of the mem-

* Robin, *Mémoire pour servir à l'histoire anatomie de la membre muqueuse de l'ut. Arch. général*, juillet 1847.

† Hennig, *Der Katarrh*, &c.

‡ Hennig, *Catarrh der weibl. Geschlechtsorgane*, 1846.

brane, and this is especially marked at the lower part of the uterine cavity and in the neighborhood of the tube-orifices; on the other hand, the ducts in the upper part of the body and at the base have frequently an oblique or nearly horizontal direction.

"The base of these glands is very difficult to isolate in the normal uterus; in the menstruating or pregnant condition it is less so; it is also very seldom possible to obtain a complete view of it on cross-section, because of its many turnings. It consists of an uncommonly thin, structureless membrane, in which we generally find ovate nuclei, especially in the menstruating organ. These bodies must be distinguished from the muscular nuclei, which remain adherent to the follicular wall during the process of isolation."

Lott says, it is true the majority of authors ascribe cylindrical epithelium to the human female and most mammals, yet all do not coincide in this.

Weber, Leydig, Henle, Kölliker, Frey, and Hennig speak of cylindrical epithelium; others, as, for example, Gerlach, Scanzoni, Schröders, describe a pavement-epithelium. Leydig asserts that the glands of most mammals have a ciliated cylindrical epithelium.

Gustave Lott says of Friedländer's assertion, that he saw vibrating epithelium in the cervix of immatured girls, that it does not accord with the observation of numerous others.

The mucous membrane, upon the approach of the catamenial period, thickens very decidedly, and the glands swell so that the spaces intervening between them are lessened, while their length is about three times as great. This is true, also, of the cervical glands, both at the *molimen hæmorrhagicum* and during pregnancy.

I have endeavored to bring to mind the minute and important anatomical elements entering into the structure of the lining membrane of the womb, for I am sure its real nature is not remembered as it should be. While we mark the differences delineated between the mucous membrane of the external cervix, the internal cervix, and the corpus uteri, it will not do to draw around disease such a constant line of demarkation, nor indeed must it be supposed, when we speak of endometritis, that we entirely separate the morbid action from the sub-mucous parenchymatous tissue so closely united to it. Especially during the acute stage of inflammation of the mucous membrane does the muscular substance bordering upon it become inflamed, infiltrated, and congested.

Although having a class of diseases to treat similar to that of Dr. J. H. Bennet,* I have not met with such a large proportion of inflammatory affections of the cervix uteri. While Dr. Ashwell, at Guy's Hospital, reported one case of inflammation of the cervix in fifty, (twenty cases in a thousand,) he, Dr. Bennet, at the Western General Dispensary, found, out of three hundred cases, that two hundred and forty-three were suffering decided inflammatory disease of the cervix or its cavity, and that ulcerations existed in two hundred and twenty-two, either in the incipient form of excoriation or in the more advanced state of ulceration.

Out of one thousand patients who have sought my section or been referred to it by my colleagues or the house-physician, on account of some uterine complication or disease, one hundred and seventy-eight had endometritis. In nearly all (except six) the cervix was affected, but, as stated above, in one hundred and twenty the inflammation was limited to the neck of the uterus, the others having general endometritis. When, however, it is remembered that many cases of the one thousand were trivial complaints, not warranting any physical examination, the disproportion is not so great as it at first appears, and the conviction which impresses me is scarcely different from the conclusions of Dr. Bennet, "that the very great majority of the females who apply for relief, when laboring under confirmed uterine symptoms, physical or functional, will be found, on careful examination, to be suffering from inflammation of the neck of the uterus," or, I would like to add, its ravages.

The physiological *molimen hæmorrhagicum* of the uterus, which corresponds to the maturation and escape of a Graaffian vesicle from the ovary, verges upon the congestion which is usually accounted the first stage of inflammation, and any cause operating to intensify this periodic congestion, or to perpetuate the same, cannot fail to produce a train of tissue-changes with attendant symptoms usually recognized as inflammatory. This menstrual congestion generally lasts ten or twelve days, for it precedes and follows the sanguinous flow by two or three days, so that during only about two-thirds of each month is the menstruating female free from the danger incident to such a predisposition to inflammatory action.

Anything which induces, directly or indirectly, hyperæmia of the uterus or its lining membrane, such as cold, may excite an acute inflammation which will probably soon abate—it may be, will disappear entirely—but frequently

* Bennet on the Uterus, page 44.

is excited again by a repetition of the same or some similar provocative, aided by a constantly recurring periodic congestion of the uterus, until it finally becomes permanently established. This class of patients usually bears with the attending discomforts until the sympathetic troubles arrest the attention of the physician and then these complaints are traced to their source: this is especially the case with virgins.

Chronic endometritis often recognizes the same causes as acute or chronic metritis and is very frequently a follower of acute puerperal endometritis. Miscarriages and abortions often excite this disease. Blenorrhagic contagion, violent or excessive sexual intercourse, any direct injuries to the uterus, vaginitis, attempts to produce criminal abortion, improper or careless use of the sound, pessaries, (particularly intra or stem,) and general conditions or diseases, such as tuberculosis, exanthematous fevers, &c., may be enumerated as causes of endometritis. The following table will give only a partial idea of the causes operating to produce endometritis in the cases as seen at this dispensary-service.

Many of the enumerated causes were really only conditions which favored the operation of other agencies, as for instance parturition, in which cold, instrumental interference, want of proper rest, injudicious hygienic or sanitary measures, &c., were really the direct causes of the attendant inflammation.

Endometritis.

General:		
Blenorrhagic	18	
Following parturition	26	
Other causes, cold, &c	8	
	—	52
Corporeal:		
Blenorrhagic	2	
Cold at menstrual period	3	
Unknown	1	
	—	6
Cervical:		
Blenorrhagic	4	
Abortions	21	
Miscarriages	5	
Following parturition	32	
Cold at menstrual period	11	
Other causes	47	
	—	120
Total		178

Twenty-two of the one hundred and seventy-eight cases of endometritis were seen in the acute stage and the rest (one hundred and fifty-six) presented the chronic or sub-acute form of inflammation.

Symptoms.—Often the existence of endometritis is so little manifested by direct symptoms, that its insidious invasion has not been combated, or even discovered, until it has become well established.

It is a great mistake to suppose, with many physicians even, that a virgin never suffers from inflammation of the uterus. It is not a very uncommon occurrence, and my own observation attests the experience of Dr. Bennet as to its existence. Frequently I have been almost satisfied of its presence, when I could not, from what I feel is a judicious delicacy, propose or insist upon an examination, and sometimes the physician has to combat the importunities of an anxious mother, who, on account of a slight vagiual catarrh in her daughter, wishes an examination to be made. When, however, the gravity of the symptoms demands it, a false delicacy that would sacrifice the general health and well-being of the patient is reprehensible. Of the one hundred and seventy-eight cases, only four were maidens whose claims to virginity were beyond question.

The most constant symptom was leucorrhœa, which in one of its forms was complained of in nearly every case at some stage of its progress. To distinguish between the discharges from the vagina, the cervix uteri, and the corpus uteri is of prime importance. The discharge, if vaginal, must proceed from the mucous glands about the ostium vaginæ, inasmuch as there is no apparatus for any considerable mucous secretion between this and the os uteri. Under the stimulus of venereal passion these glands sometimes secrete a profuse amount of mucus, but in their normal condition the amount secreted in the absence of such excitement is so inconsiderable as to be unobserved. Along the vaginal canal a sufficient quantity of mucous secretion exists to lubricate its surface; and, when irritated, the epithelium is shed very rapidly, the cells often being immature. The whole of this vaginal secretion is, in the normal condition, as before remarked, distinctly acid and rich in epithelium, and, save in some cases, under sexual orgasm, is never so abundant as to appear as a discharge. The acidity of the vaginal secretion exercises a marked influence upon that of the uterus. Dr. Whitehead has insisted upon its action in whitening the mucous secretion by coagulation of its albumen, its less viscidity, and its power of preventing the coagulation of the

menstrual flow. Dr. T. Smith has shown how a little weak acetic acid will change the thick viscid mucus of the cervix so as to resemble the curdy mucus of the vagina. "It loses its viscidity and transparency altogether." This change takes place in the vagina owing to its acid secretion, and hence the discharges which most frequently come from the uterus may be attributed to the vagina.

The secretion of the mucous glands of the cervix uteri in health is clear, tenacious, alkaline, and filled with mucous corpuscles. This secretion is increased at the menstrual period, during gestation, and also during parturition. When it occupies the os uteri any length of time, the acidity of the vaginal secretion acts upon it as in pregnancy, causing the plug to appear opaque and white or curdy. Each of the above conditions stimulates the glandular apparatus of the cervix and an increased secretion results.

The same happens in inflammation of the cervical mucous membrane, and it is this hypersecretion, acted upon by the vaginal acid, that in nearly all cases constitutes leucorrhœa.

If the cervix be exposed with the speculum, a tenacious, ropy mass of partially changed opaque mucus hangs from its os, and sometimes the vagina is covered with detritus from this source, on account of the wearing away, as it were, of this ropy mass, owing to its changed character, produced by the acid secretion of the vagina. Often the vaginal surface is bathed with a creamy fluid, which results from this same reaction. Dr. Tyler Smith illustrates this reaction and change when he says: "It appears to me that, of the two principal forms of the discharge, the secretion from the canal of the cervix uteri may be compared to soft or fluid soap. It seems as if the alkali of the discharge combined with the fatty and albuminous element to form a saponaceous compound."

When pus is formed it mingles its cells with the mucus, and then mucopurulent characteristics prevail, while, if the denuded or ulcerated membrane bleeds, we find blood-corpuscles entering into the discharge. When blood is present to a limited extent, the discharge, as it appears at the ostium vaginæ, is of a dirty-brown or greenish hue. Tyler Smith calls attention to the fact that if the flow of blood is considerable, it may mask the leucorrhœal discharge, and be mistaken for menorrhagia.

The amount of leucorrhœal discharge varied from a mere show, which only stiffened or stained the underclothing, to a profuse, debilitating quantity

which kept the person and clothing constantly bathed and saturated. Where vaginitis, ulceration or erosion of the external vaginal cervix or of the cervical canal did not exist, the amount of discharge was, as a rule, not very abundant.

The character of the leucorrhœal discharge will often be of great diagnostic value. I have already adverted to the difference existing between the mucous membrane of the body and the cervix, and this will indicate at once why we should expect a difference in the character of the discharge. The secretion of the utricular glands of the body and the Nabothean follicles of the neck give to the hypersecretion of each of these uterine regions a characteristic appearance. The exudation of blood-corpuscles mingled with mucus may, as Dr. Bennet says, be considered as characteristic of internal metritis, as the rust-colored expectoration is of pneumonitis; and Dr. T. G. Thomas verifies this observation to a certain extent: "It is certainly a very reliable and valuable sign."* This sanguineo-mucous discharge continues sometimes during the whole interim of the catamenial period. Often, indeed, it is so bloody that the patient cannot tell when her catamenial period ceases or begins. Another characteristic discharge which I have noticed in some cases was a profuse sero-sanguineous flow. It was of this character in two of the cases of corporeal endometritis. Sometimes pus was mingled with the discharge from the corpus, and this was frequently the case also with that of the cervix; but, when present to any considerable extent, the cases were the most intractable to treatment. I have noticed, moreover, that the discharges from the body of the uterus were more apt to be offensive than from its neck or from the vagina.

When the inflammation affected only the cervical mucous membrane, the discharge was more glairy, and as it passed from the vulva was opaque and often like boiled starch or gum-water which contains some undissolved portions of gum arabic. Sometimes blood was mixed with the discharge, giving to it the brown or green appearance before spoken of, and pus-corpuscles in greater or less numbers were also frequently seen. I might say, in fine, that in the great majority of the cases of cervical endometritis, the discharge was muco-purulent, alkaline and often contained blood-corpuscles; that the discharge as it issued from the vulva, when alkaline, always came from the lining membrane of the uterus; that the absence of the alkaline reaction

* Thomas, Diseases of Women, page 260.

did not prove that the discharge was vaginal, inasmuch as its primary reaction may have been changed by the acidity of the vaginal secretion, and that the admixture of pus or blood indicated some destruction of the mucous tissue.

Another almost universal accompaniment of endometritis was pain in the sacral, lumbar, inguinal, or pubic regions. It was very seldom that pain in some one of these localities was absent. Sacral pain, or probably, more frequently, sacro-lumbar pain, was present in a large number of cases, but was often associated with pain in the left ovarian or hypochondriac region. These pains were much more severe and constant when granular erosion and ulceration existed in the cervix, or when the corporeal section was involved.

The sacral pain was sometimes complained of in the lower region of the sacrum near the coccygeal articulation, sometimes at its upper part, occasionally along the whole sacrum and coccyx. This pain was usually described as of a dull, aching, sometimes burning character, worse after exercise and during and immediately after menstruation.

This backache was almost always accompanied by extreme muscular weakness, and when the erect posture was assumed, this weakening pain in the back seemed to enervate the entire system; yet in many cases the pain itself was not complained of as being acute. Sometimes the patients stated that they suffered most when walking, but oftener they complained chiefly of the standing posture. Pain in the iliac regions was usually confined to the left. Many practitioners have sought for an explanation of this, but I have heard of none that was satisfactory; yet it is a very frequent accompaniment of endometritis. It corresponds sometimes to the situation of the left ovary, but usually it is higher up; often it is seated in the left inguinal or hypogastric regions. When this pain existed at the same time with backache and extreme muscular weakness and debility, I have never failed to find uterine disease of some kind, most generally endometritis, partial or entire. Dr. Bennet says, speaking of this pain in the left ovarian region, and failing to explain its relation to the uterus: "The fact, however, is undeniable, and renders the existence of a dull, aching, constant, circumscribed pain in the left ovarian region all but pathognomonic of inflammatory disease of the cervix uteri."

One case was so illustrative of these symptomatic truths, that I will briefly narrate it. A young lady, aged eighteen years, had always enjoyed

excellent health until within about sixteen months. She was of fine physique, and always was very strong, but since the time mentioned, her strength has been failing and she has suffered much from a gradually increasing pain "in the lower part" of her back; pain in the left ovarian region; a feeling of fullness and weight in the pelvis; frequent headache; distressing distension of the bowels, which compelled her to undress and seek her bed; frequent vomiting, and, occasionally, a slight leucorrhœal discharge; menstruation continued regular until recently, when dysmenorrhœa was added to the list of her complaints, aggravating all the others. From having been a strong, sprightly, and accomplished young lady, fond of exercise, household duties, and the dance, she is now utterly prostrated, melancholic, spiritless, and despondent, unable to walk a square without extreme suffering, and can only amuse or employ herself as an invalid. Her chief complaints were pain in her back, greatly increased by standing or walking; "want of strength," as she expressed it; and meteorism, her abdomen becoming enormously distended, interrupting respiration, interfering with the heart's action, and unfitting her for the enjoyment of society and the ordinary pleasures of life. A physical examination discovered corporeal endometritis. She was a virgin and the hymen was intact.

In some the pain was referred to the uterus itself, but only in a few cases, and these were complicated with parenchymatous inflammation. Pain during coitus was a very frequent accompaniment. Severe dysmenorrhœal pains were frequently complained of, and sometimes uterine tormina or spasm, during which the suffering was extreme; pain and tenderness were sometimes present also along the crest of the ilium.

In nearly all these cases of endometritis, pain was increased at the menstrual period. It is not to be inferred that painful menstruation was always a symptom of inflammation of the uterus, but when dysmenorrhoea did not previously exist, its subsequent appearance was a symptom of no small significance. Neither did its absence prove that uterine inflammation was not present.

Accompanying some of the above-mentioned pains, a feeling of bearing-down, or weight in the pelvis, was generally complained of. Sometimes this sensation was in the back; often in the pelvis, or at the perineum. In a few cases, uterine tenesmus was so distressing that the patient could not stand up or walk without the greatest distress; a feeling as if the pelvic organs

would drop or be strained out of the body. By a careful research among the many pains, aches, and distressing sensations complained of in these cases of endometritis, I find that most of them can be referred to that category of nervous disorders usually denominated *sympathetic* or *reflex*, and often the distress or suffering complained of was so remote, and apparently so disconnected from the uterine region, that without constantly keeping in mind the widespread sympathetic relations of the womb to the entire nervous system, mistakes would constantly occur.

Too often are these complaints unheeded by the friends of the patient, or they fail to command that sympathy which their reality deserves. Those who surround the patient do not comprehend such remote sympathetic sufferings, when, as so often is the case, the general physical appearance of the patient does not indicate disease. They are apt to suppose, because at times, under the influence of excitement, these sufferers seem to forget themselves and pass, as it were, from the bed of torture to the rooms of social pleasure or the halls of gaiety and mirth, that the patient's sufferings are more imaginary than real. This mistake is a very serious one, for the want of consideration and sympathy, to say nothing of the reproaches and rudeness with which their complaints are sometimes received, depress and paralyze the already impaired mental and moral faculties, which, reacting upon the disease itself, aggravates all the symptoms, besides sometimes inducing a state of depression and melancholia more painful to witness than the agony of disease.

Fortunately the days have gone by when these sufferers fail to find any appreciation of their complaints by physicians, who understand why these transitions may be sudden and complete, yet not merely whimsical. I am almost afraid that many medical men do not remember as they should how frequently aberrations of the mind, mental hebetude, morbid hallucinations, irritability of temper, moroseness of disposition, and sometimes even insanity are induced or excited by uterine disease. They fully understand how menstruation and pregnancy react upon the nervous centers, but often forget that disease may in a greater degree affect the same.

If time and space allowed, I would like to classify and group these reflex complaints and diseases, but they forbid, and I can only refer to a few of the most prominent.

Headache, so frequently considered neuralgic, was a very constant

attendant upon cases of endometritis. Sometimes the whole head was affected, but most frequently the pain or ache complained of was in the crown or back of the head. This form of headache is mentionod by most authors as symptomatic of uterine disease. Says Byford: "It is almost invariably the case that a woman has chronic uterine disease, if she complains of persistent pain in either of these regions. The occipital pain I have observed in this connection much oftener than the pain on the top of the head." This last observation does not hold good of cases seen in this dispensary, for pain at the vertex, or on top of the head from the vertex along the sagittal suture to the frontal bone, was present in a much larger number of cases than where it was confined to the occipital region. Frequently, hemicrania, pain in the eyes, through the temples, or over the brow, existed. The *character* of the pain is important. That on the top of the head was usually spoken of as a "burning pain," as a "hot spot on the head," and was oftenest noticed in sterile women, and, as might be inferred, in those suffering corporeal endometritis, for sterility is most usual where this exists. My observations correspond with Dr. Byford's in that, when headache was much complained of, the patient seemed to suffer fewer other symptoms of uterine disease, although an examination disclosed its presence, and a cure of the uterine disease relieved the cephalalgia.

Headache was frequently accompanied by nausea or sometimes by vomiting, (sick-headache.) The sympathy existing between the uterus and the stomach I have already referred to in the article on chronic metritis. This sympathetic disturbance of the stomach in endometritis was of an ordinary dyspeptic character, sometimes induced by special articles of diet. In one case, the patient rejected apparently everything soon after eating. In many others, great distress was manifested after meals. Cramps attacked some after each ingestion of food—anorexia, voracity, depraved tastes, sometimes were features of this stomachic derangement. The bowels were constipated in a large number, sometimes diarrhœa alternating with constipation.

The intestines often, as mentioned on page 301, became distended with gas; borborygmus was common, and sometimes in the married this meteorismus was mistaken for pregnancy by the too willing patients or their friends.

Hyperæsthesia of the skin in some portion of the body was also present at times, especially over the abdomen and scalp.

It will be noticed that many of these sympathetic complaints are usually recognized as hysterical, and such they may be called. Most of the cases of hysteria, I have generally found were connected with, if indeed they were not caused by, uterine disease. Convulsions, when this is the case, are much more apt to occur during or about the menstrual period. The cases of so-called "spinal irritation" in females, especially virgins, are, much more frequently than is usually supposed, the subjects of endometritis.

When these sympathetic phenomena had existed for a long time and the leucorrhœal discharge had continued profuse, the patients were generally anæmic. In some, marasmus was extreme, and the worn, emaciated, feeble invalid had succeeded to the buoyant, well-developed, strong woman. Nervous suffering, with its despondency, loss of rest, and morbid excitability, seemed, in a few instances, to have worn out health as well as life, without being complicated by any great drain upon the economy, such as excessive leucorrhœa or hemorrhage.

I do not know of any patients who have died directly from endometritis, but in some instances the health was so much deteriorated by the disease and its sympathetic affections that the subject was predisposed to many intercurrent diseases and their ravages.

Although, from the presence of some of the above-mentioned local, sympathetic, and general symptoms, we may be almost sure of the presence of uterine disease, yet we cannot be so certain of its location, extent, character, or complications. What, however, remains to be determined will be quite satisfactorily ascertained by a careful physical examination of the pelvic organs

By the bi-manual method of palpation, when the endometritis was general, the whole organ was found to be enlarged, (not so much so as in metritis, however;) tender to deep pressure, and exquisitely painful if the cervix was bent upon the body, which caused the inflamed surfaces to rub against each other. The neck was puffy, or more or less indurated, and if carefully pressed at the os uteri, this gaping, dilated opening seemed to be the open end of a hard cylinder, the cavity of which was represented by the dilated uterine canal and its walls by the mucous membrane and adjacent parenchymatous tissue, which had partaken of the morbid change. This denoted

endometritis, which had existed for a considerable time. The organ rolled about in the pelvic cavity in some, and assumed a mal-position determined by gravity. The cervix was low in the vagina, and often, from its increased size, pressure upon the rectum or neck of the bladder explained any local symptoms relating to these important viscera. Erosion or ulceration of the external vaginal cervix could generally be detected by digital explorations. By using the speculum, the amount of congestion, inflammation, and ulceration of the upper portion of the vagina and external vaginal mucous membrane was noted. In two out of three of the cases where the cervical canal was affected, abrasion or erosion of the mucous membrane of the vaginal cervix uteri was observed, and in each of these cases the leucorrhœal discharge was purulent. The vaginal cervix was generally discovered bathed in muco-pus, which required to be wiped away before the real character and extent of this erosion were manifest. Dr. Bennet has cautioned against supposing the bright, rosy hue of the vaginal and cervical mucous membrane in women of very fair complexions to be indicative of inflammation or congestion; and, moreover, the white, creamy secretion often present soon after menstrual periods, or when a little congestion from cold prevails, must be discriminated from muco-pus. Ordinarily the erosion or ulceration was so well marked that no difficulty was experienced.

Sometimes the lips of the uterus required to be gently separated before the excoriation could be seen, and in some cases, although very few, a solution of nitrate of silver, as suggested by Dr. Bennet, was penciled over the surface of the os and vaginal cervix, when its presence and limits could be easily defined.

Ulceration, as usually referred to, when speaking of uterine disease, is so often misapprehended that I doubt if I shall be understood when I say that, in the sense as comprehended by some, I have never seen in any of these cases of endometritis the excavated ulceration they seem to suppose exists; that is, destruction and loss of tissue, as characterized by elevated edges and depressed centers. In some stages of follicular ulceration, when the follicle has just burst, a depression may exist; but this is very soon filled up by hypertrophic enlargement of the villi, which soon protrude beyond the surrounding surface. When the anatomical characters mentioned in the beginning of this article are considered, it will be easy to understand why

the depressed excavated ulcer does not appear on the cervix and os uteri much oftener. The abrasions, excoriations, and granular erosions are but stages of the ulcerative process. We may discover erosion or separation of the epithelium, hypertrophy of the villi, which crowd upon each other, choking out the most weakly, or fissures between these exuberant villi, giving to the surface of the cervix a resemblance to raw beef. The granulations bleed very easily, and often they may be seen studding the cervical canal.

A condition resembling, at first glance, an abrasion about the os uteri, or its vaginal surface, I met with in two cases at the dispensary, and they were similar to those mentioned by Chomel in his "Clinical Lectures," referred to by Dr. Tilt* as being similar to the port-wine stains or erectile spots on the skin, and, in reality, are the result of exaggerated blood-vessels of the villi. In both of these cases profuse hemorrhage had been suffered, and they were cured by destroying the diseased surface with the potassa cum calce.

In nearly all the cases of endometritis, especially where the neck was involved or where abrasion or ulceration existed, the external os uteri was open to a greater or less degree—greater in those who had borne children, less in those who had not. Sometimes, from the swelling of the mucous membrane of the cervical canal, its cavity appeared reduced in caliber, but this œdema soon disappeared with the acute symptoms. This opening or dilation of the external os and cervical canal, and of the internal os when the disease extends beyond it, has never, that I know of, been satisfactorily accounted for; yet the fact exists and constitutes an important diagnostic symptom.

In those cases where the sound entered the uterine cavity without recognizing any narrowing of the internal os, the fundus and body of the uterus were found enlarged and very tender, and gave other signs of corporeal inflammation; while, on the contrary, when this strait was appreciable by a slight resistance to the progress of the sound, these indications of corporeal disease were usually absent.

Treatment.—The treatment of endometritis at this dispensary has been far more satisfactory than of metritis. Much that was attempted for the cure of chronic metritis had a decidedly better effect upon endome-

* Braithwaite, part xxix, p. 286.

tritis. Strict attention was directed to the general health of the patients, and as the disease almost always presented itself in the chronic stage, its effects had been already felt on the constitution, therefore tonics, especially the chalybeates, were liberally prescribed, with moderate out-door exercise, and a good, nourishing, plain diet; ameliorating by appropriate medicines, as far as possible, the distressing symptomatic affections, so as to procure comfort and rest; and counseling moderation in (but not always entire abstinence from) coitus.

Very much can be accomplished in the management and cure of endometritis by general treatment. Medicines administered constitute but a small part of the general treatment referred to. We must include, attention to hygienic and sanitary laws, the regulation of diet, the avoidance of fatigue and exposure, the procurement of moderate and judicious exercise. We must allow an abundance of fresh air, surround the sufferer when possible by cheerful associations and companions, enlist the sympathies of her friends, infuse hope, and relieve, with such therapeutic agents as are applicable, whatever distressing symptoms may be most complained of, never losing sight, however, of the fact that *any general depletives always do harm.*

Nervous symptoms were often relieved by the bromides of potash, of ammonia or of soda, the valerianates of quinine, of iron, or of zinc, and counter-irritations of iodine or turpentine. The digestive function was particularly interrogated, and promoted when deranged by pepsine, nux vomica, etc.; but stimulants were particularly avoided for reasons already mentioned.† I have often prescribed a formula, however, which I learned from Dr. Thomas, of New York,* and I have seldom failed to observe the "best results" which he so often obtained from its use in these cases of sympathetic derangement of the stomach, where the gastric juice seems to be inefficient in digestive properties. It is the following:

℞ One rennet, washed and chopped.
Sherry wine, 0i.
Macerate for twelve days; then decant, filter, and add:
Dilute nitro-muriatic acid, 3ii.
Tinct. nux vomica, 3ii.
Subnitrate bismuth, 3ii.
One tablespoonful in a quarter of a tumbler of water before each meal.

* Thomas, Diseases of Women, page 245, 2d ed.
† Article ii, p. 278.

The above was often modified thus:

℞ Bismuth subnit., grs. v.
Pepsine pulv., (sacch.) grs. x.
Nucis vomicæ pulv., grs. ii.
M. (Put in capsule.)
Sig. Take immediately before each meal.

When acidity was present and the stomach and bowels distended with the gases of fermentation, it has been customary to direct ℞ sodæ hyposulph., gr. x to xx, about an hour after each ingesta. When constipation existed the compound nux-vomica pill (omitting the mass. hydrarg.,) as directed in Article ii, page 279, was found efficacious, provided the patients will assist its action by habitual and regular attention to alvine evacuation.

It is surprising how the rectum can, as it were, be educated to discharge its contents at regular times.

Rest in some cases was found to be necessary, especially if any acute action was present or was excited by menstruation or sexual over-indulgence. Of course, during some of the stages of local treatment, the patient was kept in bed or compelled to remain in the reclining posture. After local treatment had been prosecuted for a reasonable time, the patients were advised to seek a change of air and scene, but in this class of individuals who frequented the dispensary, compliance was rarely within their power.

The benefits to be expected from general treatment alone, while very considerable, are not satisfactory; but, when united with local measures, reasonable expectations are usually realized. Often the relief afforded is as gratifying as it is unexpected by the patient and friends.

Where excoriations or ulcerations exist we cannot expect a cure without topical treatment. Much relief may be attained by other means, but I have yet to find an erosion or ulceration of the os or cervix uteri which healed spontaneously. Patients have repeatedly consulted me about this condition, and after having been examined they have gone away, often to the country, and when they returned, although greatly improved and much relieved, yet the local lesions remained about the same. Dr. Thomas* has expressed this opinion also when speaking of granular ulceration. "There is no proof existing that this disease is ever recovered from without surgical interference. Although, as to this being impossible, I am by no means positive."

If acute symptoms prevailed at the time of commencing treatment, a

* Thomas, Diseases of Women, page 305, 2d ed.

few leeches were applied to the cervix or the cervix was scarified, the patient being kept in bed and the vagina syringed with hot water every few hours. This mode of local depletion, by leeching or stabbing the cervix, was repeated every other day, until the symptoms were relieved. Very often, after each syringing, the glycerine-tampon was applied, as in metritis. Often a week of such treatment sufficed to abate every acute symptom; and, where the patients remained under treatment until discharged, they have had no return of the trouble, except in cases where the acute attack supervened upon a previously existing chronic endometritis. In all but two of the twenty-two cases seen in the acute stage, the disease was confined to the cervical canal.

Of these latter, twelve were discharged cured, and the rest (ten) failed to report after the acuteness of the disease disappeared. The two where the whole uterine canal was involved were blenorrhagic and very obstinate, running into the chronic form and requiring about six months of treatment for their restoration. After the acute stage, if any appearance of disease remained, the same treatment was pursued as with the chronic cases now to be mentioned.

In chronic endometritis, sometimes called chronic catarrh of the uterus, the use of the sponge-tent is almost invaluable. When it is remembered how many thousands of mucous glands are hidden between the folds of the cervical rugæ, and how impossible it is to bring any medicament into contact with them, it will at once commend itself that a very great advantage is gained if these folding and rugæ are distended so as to expose the whole mucous surface to the action of whatever agent we use to modify their diseased condition. In addition, we obtain the good effects of the sponge itself—pressure upon the hypertrophied and engorged papillæ. In Article ii, page 281, the sponge-tent has been discussed, and no doubt much of the good resulting in its use in chronic metritis is due to its beneficial effects upon the concomitant mucous disease in that affection. Then, again, the tents may be so medicated as to possess alterative and astringent properties and may be carried to the fundus uteri.

In the dispensary, the tent has been much used as an accessary to other means of local treatment, but often its direct effect was decidedly beneficial. In those cases where granulations, (fungous and sometimes polypoid in form,) extended into the cervical cavity, and doubtless into the corporeal also, its advantages were most apparent. During its use, the recumbent posture was

enjoined, or, at least, confinement to the house. Sometimes patients would go about their usual occupations without any inconvenience while wearing the tent, but this is to be condemned as imprudent in any case. After dilatation had been completed, sometimes the uterine injections were practiced, or the sponge or cotton probang, armed with some caustic or alterative medicine, was used. Uterine injections and intra-uterine applications were mentioned in connection with chronic metritis, *and I refer the reader to that article, to avoid repetition.

As a rule in these cases, Emmett's "applicator," a flat silver probe, around the end of which raw cotton had been twisted, was used to make intra-uterine applications. The end covered with the cotton was dipped into a saturated solution of carbolic acid, and, after carefully wiping away all excess of the acid, it was passed into the cervical and into the corporeal uterine cavity, if affected, turned about in various directions, and then gently withdrawn. The applications were made twice a week, and, when it was possible, the patient remained in bed during the rest of the day. Every day a pledget of cotton soaked in glycerine was pressed against the cervix or into the posterior *cul-de-sac*, and allowed to remain until evening, when it was removed and the vagina syringed freely with warm water containing alum and sulphate of zinc. The alum and tannic acid solution is better, but the latter ingredient stains the clothing, so as often to be disagreeable.

While it is true that vaginal injections generally fail to reach the real seat of the disease, yet their use is of great benefit, not only in deterging the parts, but they impart tone to the vaginal mucous membrane, so often relaxed, causing contraction in the walls of the vagina, and thus raise the partially prolapsed uterus. In addition, they reach the external mucous surface of the uterine neck, which is often implicated, come in contact with the mucous follicles of the os, and often penetrate into the cervical canal. In treating virgins this latter is often the only mode of treatment that can be adopted, save what is general.

The nitrate of silver was frequently used with great success, but I am afraid it sometimes caused cicatricial hardness when applied indiscriminately. It has been a custom with some to pass the stick of nitrate of silver into the cervical canal, irrespective of any visible ulceration, and this was persisted in, month after month, to cure chronic uterine catarrh. Some cases treated in this way have presented themselves, and I have invariably found the sur-

*Article ii, p. 281 to 186.

faces around the os uteri hard and inelastic, seeming to be cicatricial. I am not certain that this condition proceeded from the use of the caustic, but it has appeared so sometimes. Nevertheless it is a valuable agent and particularly adapted to the cure of follicular erosions. Its use was almost invariably followed by more or less hemorrhage.

Chromic acid was occasionally used, especially in cases complicated by granular erosion, or when the os and cervical canal seemed studded with mucous polypi. In some instances it was introduced into the uterine cavity, in the same manner as the carbolic acid.

Tincture of iodine and persulphate of iron were also used, especially the former, in intra-uterine injections, or applied by means of a camel-hair pencil. Next to carbolic acid it has been used at the dispensary in the treatment of chronic endometritis more frequently and with better results than any other local remedy.

The *curette*, as recommended by Récamier, and more recently by Tilt, I have never used, nor do I consider it to have ever been called for in any of the cases I have met with, either in hospital, dispensary, or private practice.

The foregoing will give some idea of the general and local treatment of this disease, and while I cannot, in the ultimate history of each case treated, record a perfect cure, yet there is sufficient evidence to attest that its results have been flattering to the institution, as they have been advantageous to its beneficiaries.

I had hoped that I might be able to report in full the cases of para and perimetritis, but the very short time that has elapsed since the report was determined upon, and an unusual demand upon my time and energies, compel me to abandon my first purpose, and to submit the foregoing hastily prepared papers, with the general synopsis, for your consideration.

The increased facilities which the hospital and dispensary will possess in the coming year, the more thorough acquaintance with its special departments, the more accurate record of its cases, and the augmented interest growing out of these advantages will enable and stimulate those having charge of its various sections in the future, to present such a statement of its workings as will be commensurate with its progress and success.

I desire to express my thanks to my colleagues and to the dispensary-assistants for their uniform courtesy and kindness, and to yourself for that counsel and aid which have so often been sought, but never in vain.

DEPARTMENT

OF

THE DISEASES OF CHILDREN.

BY

SAMUEL C. BUSEY, M. D.

DEPARTMENT OF DISEASES OF CHILDREN

My Dear Doctor: In compliance with your request I herewith transmit my report of the operations of this department of the Columbia Dispensary, arranged in tabular form and accompanied with remarks upon several interesting subjects connected therewith. I have simply sought to present my own opinions and to explain the practice which has yielded the most favorable results, and have not pretended to discuss fully and completely the causes, nature, pathology, and treatment of the several diseases alluded to, nor to enter into any minute and detailed description of the various forms in which they present themselves, nor to discuss the relative merits of the different methods of treatment or of the various substances employed in the treatment, but have confined myself closely to the precise points which I desired to set forth.

I regret that I am unable to call your attention to many interesting and anomalous cases which have been presented at the dispensary, which, perhaps, might have added more interest to your report than any opinions of my own.

Hoping, however, that the accompanying report may prove acceptable, I remain yours, &c.,

S. C. BUSEY, M. D.

J. H. Thompson, M. D.,
Surgeon-in-Chief.

DEPARTMENT OF DISEASES OF CHILDREN.

By Samuel C. Busey, M. D.,

(*Physician-in-Charge.*)

Article I.

Febris Intermittens.

To facilitate the summing up and analysis of the operations of this department, I have constructed the following tabulated statement, which shows at a glance the sex, color, and diseases of the patients which have been treated in this department since its organization, in September, 1869. No one over fifteen years of age is admitted, and all applicants suffering from ophthalmic and aural affections have been referred to the department of diseases of the eye and ear. Those suffering from any menstrual trouble have been referred to the department of diseases of women and a number who could not be properly treated in the dispensary have been sent to the Children's Hospital. Neither of these classes are enumerated in this table. The fifty-two "not classified" comprise all trivial complaints which needed no special attention, cases of obscure and uncertain diagnoses, and cases of novel and anomalous character, to some of the more interesting of which I may briefly refer hereafter.

In classifying the diseases much embarrassment has been occasioned by the want of a uniform and accepted nomenclature of the diseases of children. In the selection of the nosological terms herein employed, I have followed approved authors. Doubtless some incongruities will be apparent to the intelligent reader, but I have sought to avoid the not unfrequent error of employing nosological terms indiscriminately drawn from different languages, according to the fancies of the author.

Classification of the diseases of children treated at the Columbia Hospital Dispensary from September 1, 1869, to July 1, 1872.

[TOTAL NUMBER, 1,028.]

	Febris remittens.	Catarrhus vaginæ.	Prolapsus ani.	Polypus nasi.	Insomnia.	Morbus coxæ.	Hydrocele infantalis.	Epilepsia.	Icterus.	Ozæna.	Hernia ingenita.	Parotides.	Furunculosis.	Hydrocephalus ingenita.	Morbus Brightii albuminuria.	Pyrosis ingenita.	Rauula.	Cryptorchidia.	Paraplegia.	Atrophia musculorum ingravescens.	Tortocollis.	Rheumatismus acutus.	Hernia pudendalis.	Epistaxis.	Hydrocephalus acutus.	Labrum leporinum.	Cellulitis.	Injuriæ.	Asthma.	Not classified.	Aggregate.
Male	3	.....	2	...	1	2	3	1	1	...	2	...	2	2	2	1	1	1	1	1	1	1	...	...	1	1	1	24	1	23	75
Female	1	4	2	3	2	1	...	1	1	2	1	2	...	1	...	...	...	...	...	...	...	...	1	1	...	...	...	21	3	29	78
White	3	.....	3	...	3	1	...	1	1	2	1	1	1	...	...	...	...	...	...	...	...	...	1	1	...	...	1	23	...	28	72
Colored	...	4	1	3	...	2	3	...	1	...	1	1	1	2	2	1	1	1	1	1	1	1	...	...	...	...	...	22	4	24	81
Total	4	4	4	3	3	3	3	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	45	4	52	153
Male	120	44	40	20	19	16	22	13	11	11	9	7	7	7	8	4	4	5	10	11	3	3	3	4	7	1	3	3	3	2	434
Female	76	57	55	33	31	25	13	9	14	11	11	10	10	13	7	10	10	9	1	7	5	4	4	3	...	4	1	4	1	6	441
White	130	48	46	15	19	20	16	6	11	11	11	10	7	7	9	4	5	9	1	7	6	5	3	1	6	1	3	4	1	2	415
Colored	66	53	49	38	31	21	19	9	10	11	9	10	13	6	5	10	9	9	10	11	6	6	4	6	1	2	2	2	2	6	460
Total	196	101	95	53	50	41	35	22	25	22	20	17	20	20	15	14	14	14	11	18	11	9	7	7	7	5	6	7	4	8	875

	Febris intermittens.	Entero-colitis.	Bronchitis.	Scrofulosis.	Helmithiasis.	Catarrhus laryngis.	Alvus adstricta.	Pertussis.	Tonsillitis.	Syphilis ingenita.	Cholera infantum.	Eczema.	Stomatitis.	Dyspepsia.	Hernæ.	Hypertrophia tonsillarum.	Phthisis pulmonalis.	Dysenteria.	Rachitis.	Neuralgia.	Otorrhœa.	Anæmia.	Pharyngitis.	Hernia umbilicalis.	Adhæsio linguæ.	Myalgia.	Dentitio difficilis.	Incontinentia urinæ.	Laryngitis.	Vomitus.	Aggregate.
Male	120	44	40	20	19	16	22	18	14	11	11	9	7	7	8	4	4	5	10	11	3	6	3	4	7	2	3	1	3	2	434
Female	76	57	55	33	31	25	13	9	11	11	10	11	10	13	7	10	10	9	1	7	5	3	4	3	...	3	4	4	1	6	441
White	130	48	46	15	19	20	16	6	11	11	7	11	7	7	9	4	5	9	1	7	6	3	3	1	6	3	4	1	3	2	415
Colored	66	53	49	38	31	21	19	21	15	16	14	9	10	13	6	10	10	9	10	11	2	6	4	6	1	2	2	4	1	6	460
Total	196	101	95	53	50	41	35	27	25	22	21	20	17	20	15	14	14	14	11	18	8	9	7	7	7	5	6	5	4	8	875

Every physician who has had any experience in a dispensary-practice is fully aware of the attendant difficulties and of the unsatisfactory manner in which the histories of interesting cases are frequently recorded. These difficulties and embarrassments are multiplied in this department. Adults, not dependent on others for physical assistance, are prompted by their individual sufferings to return regularly at the stated hours, but the parents and friends of sick children, among the poorer classes, who seek medical aid at public dispensaries, are proverbially indifferent to the ailments and sufferings of their offspring and wards; hence the great carelessness in following the prescribed directions, in the proper administration of medicines, and the dereliction of duty in failing to present the suffering child at the dispensary at the regular and stated periods. Consequently the practical results, so far as they relate to the advancement of medical science, refer almost entirely to statistical observations of the variety and frequency of diseases in particular localities. Few opportunities are afforded for the study of pathology and morbid anatomy, and mortality statistics are utterly valueless. The diagnosis and treatment of diseases are the practical lessons of a dispensary-service. The final result of the treatment is frequently left in doubt by the failure of the patient to continue attendance until finally discharged. Yet the observation of a number of cases of any particular disease, presenting in their varied aspects all the phases of the disease and exhibiting the partial, if not conclusive, effects of the different plans of treatment, furnishes a rich store of useful information. As a school for the clinical teaching of the differentiation of diseases, it is only excelled by hospital-opportunities, inasmuch as ample facilities are afforded to verify diagnoses, so far as such can be accomplished by the physical inspection and examination of the patients, and the not unfrequent opportunities to compare the phenomena of particular affections exhibited by a number of patients present at one and the same stated period. Hence the value of all statistics of the variety, number, and relative frequency of the diseases treated in dispensaries, together with the ages, sexes, and colors of the patients. For though this class of patients is drawn from the poor and needy, who inhabit the alleys and filthy streets of populous cities, occupying illy-constructed and badly-ventilated tenements, frequently crowded together without proper protection and with a scanty subsistence, the prevalence of dis-

ease among them must be accepted as the criterion by which the healthfulness of cities is to be determined.

According to my experience, dispensary-practice is singularly exempt from the exanthematous diseases and from diphtheria. This observation acquires additional interest from the fact that during the period in which these statistics have been gathered, wide-spread epidemics of measles and scarlet fever have prevailed throughout the adjacent cities of Washington and Georgetown, and within the geographical limits from which the larger proportion of the patients visiting this dispensary are drawn. Admitting the ordinary caution and care against "catching cold," which usually the poor and needy take to prevent the "driving in" of cutaneous eruptions, as the barrier to the presentation of such patients at the dispensary-building, nevertheless, if these epidemics had prevailed to any considerable extent among these classes of inhabitants, there would surely have been many cases seeking relief from their obstinate *sequelæ*. Yet but a meager number of cases of bronchitis and diarrhœa have been traced to these causes, and these are the only two *sequelæ* which have been presented.

In the foregoing table I have enumerated the diseases in the order of their frequency, and though the observations cover, in the aggregate, but 1,028 cases of disease, the numerical results are attested by the ordinary experience of private practice. In the order thus established by relative frequency, intermittent fever is considerably in excess of any other. The relative proportions of the sexes and colors are singularly interesting. Its greater prevalence among the males and whites is not simply the lesson deduced from the aggregation of all the cases admitted within the dates mentioned, but it is likewise shown by the following analysis of each year, thus materially enhancing the value of these statistical results:

Analysis of the sexes and colors of each year.

		1870.	1871.	1872.	Total.
White	Males	27	41	10	78
	Females	23	26	3	52
Colored	Males	13	23	4	40
	Females	11	13	2	29
Total		74	103	19	196

This excess of males and whites over the females and the colored is not due to any excess of males and whites admitted to the dispensary, for, in the

general aggregation of the sexes and colors, it is shown that more females were admitted than males, and more colored than whites, thus: males, 509; females, 519; white, 487; colored, 541.

The conclusion, then, is inevitable that, within the area of the operations of this institution, intermittent fever more frequently attacks the male sex and the white race than the female sex and colored race, and it becomes a matter of importance to ascertain, if possible, the causes of this difference in the sex and color of its subjects. If this difference was only confined to the sexes, it might be very easily accounted for on the very probable hypothesis that the male sex was more generally exposed to the causes of this disease; but this theory is untenable in view of the facts that in a number of patients, in which the colored and females are in excess of the white and males, a larger proportion of the white males and white females than of the colored males and colored females are seized with the disease.

With the view of testing the value of these results, I have, through the kindness of my colleague, Dr. William Lee, to whose department in this institution all the cases of intermittent-fever among adults are referred, made the following analysis of such cases. During the same period covered by the cases among children, Dr. Lee has admitted to his department 1,114 cases of all diseases, of which there were: whites, 550; colored, 564; males, 380; females, 734.

Among these 1,114 patients, there were 334 cases of intermittent fever, which, being classified according to race and sex, show the following results:

	White.		Colored.		Total.
	Male.	Female.	Male.	Female.	
Whole number.....	207	343	173	391	1,114
Intermittent fever.....	111	108	51	64	334

Thus it appears that the results shown by my statistics are fully corroborated by those of Dr. Lee. The simple fact that there were a greater number of colored female than of colored male cases, thus differing in this particular from my figures, is clearly due to the very considerable excess of females in the gross aggregate; but the ratio of the disease among the females of both races is very considerably less than among the males, and less among the colored than among the white.

Among medical men there are two theoretical explanations of the cause

of intermittent fever. One is based upon the idea that, under certain influences and conditions, a substance denominated malaria, occult in its properties and in its form, is generated and taken into the system; the other seeks its explanation in the diurnal changes of temperature. Neither of these theories furnishes a satisfactory explanation for this disparity in the sexes and colors of its subjects, for if the disease owes its origin to the absorption of a poison so minute and diffusible that it cannot be recognized, except by its peculiar and characteristic phenomena, surely there is no reason why, in a locality in which the colored outnumber the white, and which is pervaded by an atmosphere impregnated with this subtle poison, there should not be more colored than whites, and an equal ratio of females among the white and colored, made to feel its deleterious influences. As yet, physiology recognizes no difference in the structure and function of the alimentary mucous membrane of the white and colored races, neither has any difference been discovered in the pulmonary organs of the different races and sexes which favors or facilitates the introduction of poisonous malaria into the system. How far the marked and opposite distinctive colors of the skin may operate in promoting the absorption of atmospheric poisons into the general system, I shall not, in the absence of other data, seek to determine; but the comparative exemption of the African race and very general susceptibility of the Irish people to malarial influences impress me with the belief that constitutional and national peculiarities play an important part in the causation and development of intermittent fever.

The diurnal changes of temperature, either as the exclusive or associate cause, are equally unsatisfactory in furnishing an explanation of the facts exhibited by these statistics, for there is no reason why these changes would not affect alike both races and both sexes; yet it appears that in the whole number of patients of all diseases, in which the colored race and female sex are in excess, intermittent fever is more prevalent among the whites and males; and, of the intermittent-fever patients, the larger number of both races are males, and the female whites exceed the colored males. In view of these considerations it is evident that some additional cause or agency, other than the absorption of noxious malaria or exposure to the diurnal changes of temperature, must be sought to account for these apparent idiosyncracies.

To pursue the inquiry thus suggested I have classified below the ages of the sexes and races of the intermittent-fever cases among children:

Classification of ages and colors.

		1 and under.	1 to 5, inclusive.	5 to 10, inclusive.	10 to 15, inclusive.	Total.
White	Males	3	16	29	30	78
	Females	2	21	17	12	52
Colored	Males	3	11	12	14	40
	Females	5	12	4	5	26
Total		13	60	62	61	196

Thus it appears that among infants one year old and less there were six males and seven females, five white and eight colored; so that, viewing these figures in their relation to the aggregates of each race and sex, it seems clear that the causes operated alike during this period of life upon both sexes and both races, and as the proportion of the cases of disease among those of one year of age and under is so small, whether compared to the gross aggregate of all the cases or to the aggregate of the respective classes of the cases of the disease, it seems equally evident that infants are either less susceptible or less exposed to the operation of the causes. Tracing the relation which the three subsequent quinquenniads bear to the frequency of the disease among children between one year and fifteen (inclusive) years of age, it appears that among the male whites there is an increasing ratio and among the female whites a diminishing ratio, while among the colored males there exists but a slightly altered and among the colored females a markedly diminished ratio of disease between the first and third quinquenniads. This result, considered in connection with the universal law, that disease among all classes of children is far more frequent under five years of age than during the subsequent periods of childhood, and the conclusion seems irresistible that exposure in the open air and to the sun's rays constitutes an important factor in the causation. This conclusion is corroborated by a consideration of the habits of the four classes of children studied in this connection. The helpless infant, unable to walk or go beyond its mother's grasp, is usually, even among the indigent and squalid classes, protected and sheltered, as best their scanty means and comfortless lodgings will afford, from the vicissitudes of the weather and the rays of an

autumnal or vernal sun. During this period of life intermittent fever finds but few subjects, and they irrespective of sex or race. During the immediately subsequent period, when the child is permitted to enjoy its liberty, pleasures, and sports in the street, away from the sheltered seclusion of the lodging-room, exposed to an atmophere purer and more salubrious, basking in the sun-light, and yet, perhaps, breathing in the noxious and subtle malarial exhalations, the figures exhibit a marked increase in the proportion seized with fever, and this proportionate increase is common to the four classes of patients, though more marked among the whites. During the third and fourth periods of childhood the proportion of disease increases among the males, being less marked among the colored, and diminishes among the females of both races. This is the period of boyhood usefulness and boyish sports in the open air, earning a scanty subsistence or playing at tops and battledoor, while the girl is lending a helping hand to the mother under the shelter of the family domicile or at service at a more comfortable abode. Surely this is not an overdrawn picture, but simply the tracing of the cause of disease through the habits of nature, seeking corroboration of the deductions from statistics through the incidents of every-day life, and conforming the peculiarities of a disease, in the selection of its subjects, to the well-known habits of its victims.

The statistical results in regard to the relative frequency of the disease among the races and sexes of children are corroborated by the statistics of the adult cases.

The following tabulated statement exhibits the gross aggregates of the races and sexes of both classes of patients, adult and children, and the percentages of intermittent-fever patients of the sexes and races of each of these two classes of patients:

	Male.	Female.	White.	Colored.	Total.
Whole number of each race and sex of the adults....	380	734	550	564	1,114
Per cent. of intermittent fever.....	42.63	23.42	39.63	20.56	.....
Whole number of each race and sex of children	509	519	487	541	1,028
Per cent. of intermittent fever	23.56	14.66	26.67	12.21	.....

Thus, as among children, the adult males and whites are more liable to the disease than the females and colored. Thus far the analogy is complete.

But when the adults are classified according to the sexes of the two races, as below,

	White.		Colored.		Total.
	Male.	Female.	Male.	Female.	
Whole number of patients	207	343	173	391	1,114
Whole number of intermittent fever	111	108	51	64	334
Per cent. of intermittent fever	53	31	29	16	.....

it appears that the percentage of the disease among the adult white females is greater than it is among the colored males. Hence the force of the suggestion in regard to the causal influence of open-air exposure is weakened, for it cannot be that the colored males are less exposed than the white females. In the absence of any other explanation of this discrepancy, made apparent by these statistics, I am compelled to conclude that it is only susceptible of explanation through certain physiological peculiarities.* How far color operates in determining the susceptibilities of the two races cannot, in the absence of any statistics of the disease among the mixed race, be estimated. Whatever may be its influence, it does not present itself to my mind as the conclusive and determining distinction. The excess of whites is shown, by actual enumeration, to be due to the great predominance of immigrants, especially the Irish and their descendants; hence acclimation becomes a constituent in the general summing up of the causes. As physical and vital qualities are transmissible by inheritance, why may not acclimation, which has been acquired by the African through generations, be transmitted to their offspring? Thus may be explained the differing susceptibilities of the native colored and the native children of the white immigrants. Perhaps no two races are more opposite in their temperaments than the Irish and the African; the former are nervous, excitable, and impressible, the latter phlegmatic, stolid, and indifferent; yet, perhaps, none more alike in their manner of living, herding together in squalid and comfortless houses, not caring for the ordinary comforts of life, disregarding the simplest laws of health, and subsisting upon meager diet. Acclimation, acquired and inherited, which is so frequently illustrated in the comparative immunity of individual members and of fami-

* Galt, in his memoir, entitled medical notes on the Upper Amazon, (American Journal of Medical Sciences, vol. lxiv, p. 403,) states that in the regions bordering on the Lower Amazon the "native red man" is less able to resist the malarial fevers than the "white or negro."

lies of the white races, who are alike, so far as is apparent to our observation, exposed to the causes which are supposed to induce intermittent-fever, furnishes a rational, though not a conclusive, explanation of these varying susceptibilities. Doubtless there are many other influences, physiological and atmospheric, which enter into the constitution of the composite and complex causation of this fever.

The marked and rapid destruction of the colored blood-corpuscles in malarial fevers, suggests, as intimated by Dr. Joseph Jones, of New Orleans, "the action of a special poison." Chill is the characteristic phenomenon of malaria, and so likewise is it a marked feature, though perhaps not so regularly periodical, in all other diseases in which there is a rapid destruction of the colored blood-corpuscles. Dr. Jones (American Practitioner, vol. vii, p. 16) asserts that, "in malarial fever the constituent of the blood which suffers to the greatest and most essential degree is the colored blood-corpuscles," and that the destruction takes place principally in the liver and spleen. The analogous phenomena of intermittent fever and pyæmia, and the characteristic alterations of the normal color of the liver and spleen, resulting from the accumulation of the disintegrated colored blood-corpuscles, together with the nutritive changes in the same organs, present important considerations in connection with the study of the cause.

In thus pursuing the inquiry suggested by the statistics before me, I am led to the following conclusions: first, that some additional or associate element, other than the absorption into the system of the poisonous miasmatic exhalations or the impression upon the system of the diurnal changes of temperature, must play an important part in the production of this disease;* secondly, that exposure to the sun's rays in the open air enters largely into the general constitution of that complex, though as yet mythical, substance,

*Galt, in his "Medical Notes on the Upper Amazon," (American Journal, vol. lxiv, pp. 405–406,) calls special attention to the fact observed by him during his wanderings along this great river and its tributaries, that the cause of malarial fever was far more intense and the number of cases vastly greater in the localities and among the people most exposed to the tropical sun. He expresses the opinion, which is corroborated by many observations, that "excessive dryness and excessive moisture both seem to prevent the accession of malaria." He says, further, "When the wanderer leaves the main river and betakes himself to the higher grounds of any of the tributaries of this huge watery cormorant, where he begins to encounter rocky beds to the streams, rocky sides to the rivers, a comparative chillness of air in the mornings and evenings, with a greater frequency of fogs, while the mid-day is a glowing heat, there begin the *tirciana*, as the malarial intermittents are called."

malaria; and though, perhaps, not an essential element, yet like heat and moisture, holds no inconsiderable place in this etiological relation. And thirdly, That the susceptibility to these causes, whatever they may be, is very much more highly developed among the white than African race, due either to the distinctive characteristics or habits of the races; for surely no one who has lived among a mixed population of the white and black can have failed to have observed that malarial diseases either possess an elective affinity for the whites or that the African is less impressible by their causes, and that the latter suffers less frequently and less severely from the secondary effects of malarial poisoning, is more amenable to treatment, and less liable to relapses.

The symptomatic phenomena of intermittent fever during childhood differ somewhat in the earlier years of life from those marked and regular symptoms which ordinarily characterize its invasion and progress among adults, in the frequent absence of the cold stage, with defined rigors and shiverings. The fever, with sudden and high elevation of temperature, not unfrequently attended with great cerebral disturbance, and, occasionally, with alarming nervous phenomena, is usually the first warning of its inception When the febrile stage is ushered in by prodromata, they are often illy defined and demand the closest scrutiny to detect its insidious invasion. In many cases, especially in the milder forms, the periodic seizures, not unfrequently irregularly intermittent, are attended with symptoms so variable and protean in their character, that only those who may have had opportunities to observe the multiform phases in which malaria exhibits its phenomena will readily detect the insidious inception and progress of the disease. Periodicity is the only uniform characteristic, and this may be manifested in a single symptom, sometimes slight and trivial, at another time in a convulsion varying in duration and intensity, perhaps succeeded by a high fever and alarming delirium; or it may present itself in a state of collapse apparently threatening immediate death, or, again, in an array of seemingly harmless symptoms, which one feels disposed to attribute more to the anxiety and imagination of the mother than to disease. But however mild and trivial the symptoms in the beginning, if not promptly arrested, they progress into well-defined and characteristic forms, and surely eventuate in the unmistakable impression upon the general system. These insidious forms of invasion and indefinite phases are proportionately more frequent among infants and very young chil-

dren. With the advance of age the fever assumes its more regular and marked characters, and presents, very generally, the symptoms of its three distinctive stages.

When neglected and persistent, intermittent fever produces in children, as in the adult, its ordinary sequences, and the younger the child the more speedily are these effects to be anticipated. Anæmia, marked with a bloodless skin, and, in the white, with a peculiar sallow color, a small, pale tongue, almost bloodless lips and buccal mucous membrane, in the colored, with pearly-white sclerotica, though occasionally tinged yellow, which yellow tinge is usual in the white; an hydræmic state of the blood, occasionally eventuating in dropsical effusion; and enlargement of the spleen are its most frequent sequences.

*The relation, as cause, which malarial fever bears to renal disease is exceedingly interesting, and demands more careful consideration and study than have been bestowed upon it. It can no longer be denied that chronic malarial poisoning will, in occasional cases, eventuate in the establishment of disease of the kidneys.† Professor Jones, of New Orleans, who seems to have carefully studied this relation, concludes, from his observations and investigations, that, in cases of malarial fever in which albumen appears in the urine, it is due to one of the following conditions:

1. "To preceding disease of the kidneys, of the liver, or heart."

2. "To the prolonged action of the malarial poison, and the structural alterations induced by it in the spleen, liver, and kidneys."

3. "To the congestion of the kidneys from cold, or from the impaction in the capillaries of pigment-matter, or from the irritant action of the malarial poison upon the excretory structures in cases which have suffered with repeated attacks of intermittents."

In the American Journal of Medical Science (vol. lxv, p. 123) will be found a report of a number of cases of renal disease in children, which came under my observation in the Children's Hospital of this city. In two of the

* Roberts has not met with any case of renal disease occurring as the *sequela* to ague. Both Becquerel and Frerichs likewise state that, in dropsies following intermittent fever, they had never found evidence of kidney-disease; but Rosenstein found in the Dantzic hospital 23 per cent. of the cases of Bright's disease referable to antecedent ague. Heidenhain found secondary renal disease in a very large proportion of malarial fever in some epidemics. Parkes, Niemeyer, Stewart, and Dr. J. J. Woodward, have witnessed cases of Bright's disease referable to malarial poisoning.

† American Practitioner, vol. vii, p. 19.

cases the numerical relation of the white and colored blood-corpuscles was very markedly disturbed. At the time of preparing the report I entertained the opinion that the colorless corpuscles were actually increased; but, deferring to the opinion of Dr. Jones, since published, I must conclude that the increase was relative, due to the great destruction of the colored corpuscles. This view is sustained by the favorable prognosis of such cases, for the indication to restore the normal relation of the white and red blood-corpuscles by increasing the latter, rather than by diminishing any actual numerical excess of the former, is, in the present state of therapeusis, more suggestive of medication.

The enlargement of the spleen is, I think, proportionately, more frequent among children under ten years of age than among adults. From the conclusion set forth by Dr. Jones the inference would follow as a logical sequence that there was some constant coincident relationship between splenic enlargement and kidney-disease, but so far as my observations have extended none has been recognized. In the reported cases of kidney-disease consequent upon chronic malarial poisoning, there was no appreciable enlargement of the spleen. Dr. Jones states that, while he has failed to detect any evidence of kidney-disease in those cases where, from "prolonged action of the malaria," profound structural alterations of the liver had taken place, accompanied with "ascites and extreme dropsical infiltration of the lower extremities," yet, in all cases of chronic malarial poisoning in whiich he has detected albumen in the urine, he has found "structural alterations of the kidneys."

The treatment is so simple and uniform that little need be said. The notes of my cases present a few points of interest, which may serve to correct some errors in the ordinary mode of practice. Quinia is emphatically the remedy, and the principle regulating its administration is to control, as speedily as possible, the paroxysms. Experience has taught me that unless there exists constipation it is altogether unnecessary to precede it with any purgative. In former years it was considered indispensably necessary, to facilitate its effect and to avoid excessive cerebral disturbance, to precede the administration of quinia with a full purgative dose of calomel, and this preparation of the system was deemed an essential prerequisite in those cases where the secondary effects, indicated by a sallow skin and yellowish-tinged corneæ, had supervened. Such practice I am compelled to reject *in toto*. Mercury, either as an alterative or a cholagogue is contra-indicated, and should

never be given, unless as a purgative when constipation exists. Whatever hepatic complication or derangement may exist, it is simply one of a series of resultant phenomena, and is best treated by curing the primary disease. The sallow skin is a characteristic sign of malarial anæmia, and speedily yields to appropriate treatment: quinia alone or in combination with iron Except in children of one year of age and under, there is no absolute certainty of arresting the paroxysms, unless from fifteen to twenty grains be given during the intermission, and the dose of the medicine and intervals of administration should be regulated by the time to elapse between the consultation and advent of the expected paroxysm. It is always important, especially in very young, feeble, nervous, excitable children, to arrest the paroxysms promptly, and without unnecessary waste of time, for, though many children bear one or more paroxysms, without any serious consequences, occasionally alarming and dangerous symptoms suddenly complicate the case. Nor should the risk of a recurring paroxysm be incurred rather than give a sufficient quantity of medicine during a very brief intermission, because of any fear of the detrimental operation of quinia during the existence of fever. I know of no more efficient diaphoretic, and fully coincide with Jacobi, that quinine reduces the temperature more markedly and quicker than any other remedy, and does not act so rapidly on the pulse."

During the first year of my service in this institution I employed the sulphate exclusively, usually in the form of solution, dissolved with sulphuric acid. I experimented very extensively, with a view to discover some method of concealing the bitterness of the drug, but after many fruitless attempts finally abandoned it as a hopeless undertaking. With adults, since the introduction of the capsules and the compressed pills, the taste can be very easily entirely concealed. Children take the bitter solution more readily than either of these. The admixture of quinia with the fluid extract of liquorice is wholly inadmissible, because the quinia, being insoluble in the extract, soon settles at the bottom of the bottle, forming, with a sediment from the extract, a tenacious glutinous substance, which can only with great difficulty be again shaken into a homogeneous mixture, and if any acid be added to dissolve the quinia the saccharine matter is precipitated, and hence the solution is as bitter as if the menstrum had been simply water.

In 1871, my attention was arrested by the perusal of the article entitled

"The use of Quinine in the Diseases of Childhood," by Professor Binz, of Bonn, Germany, and published in the American Journal of Obstetrics, (vol. iii, p. 1,) in which he enunciated the three following conditions to be kept in view in the use of quinia in infantile disease: "First, the dose should not be too small; secondly, a readily digested preparation should be selected; and, thirdly, the drug should be administered before the disease has obtained its acme." It was Bricquet who first recognized the fact, since accepted by Binz, and Jacobi of New York, that the infantile age especially tolerates quinia in large doses. My own experience, both in dispensary and private practice, attests the truth of this conclusion. The tentative and time-wasting plan of administering quinia in minute fractional doses, with the view only to mitigate the severity and shorten the duration of successive paroxysms, is exceedingly reprehensible, inasmuch as it prolongs the course of the disease and demands additional sacrifices of the constitutional vigor. The second condition can be fulfilled by dissolving the sulphate with hydrochloric acid or, what is preferable, by using the hydrochlorate of quinia. To any child one year and under five years of age a scruple of this salt can be given in six doses during an intermission of twelve hours with entire safety, and if necessary the dose can be increased. The advantages of this salt consist in its quick absorption, diffusibility, less liability to produce gastric irritation or vomiting, and in the mildness of the ordinary nervous and cerebral disturbances.* It invigorates the appetite and stimulates digestion, in these qualities differing, in a marked manner, from the sulphate when given in full doses.

During the autumn of 1871 I administered in fourteen cases of intermittent fever carbolic acid, the same having been previously employed by Freulich. The history of these cases, with the failures and successes, I subsequently published in the National Medical Journal, (vol. ii, p. 297.) The conclusion drawn from these experiments was that carbolic acid would cure the disease, but that it was uncertain, unreliable, and slow in producing such results. Subsequently to this publication Dr. Yandell, of Louisville, published in the American Practitioner the result of a series of experiments made by him with the same agent in the same disease, with the opinion that

*Binz says that gastro-intestinal irritation is only caused by quinia when the gastric secretion is not sufficiently acid. This can always be avoided by giving quinia in a slightly acid solution. (Archives of Scientific and Practical Medicine, January, 1873.)

it was utterly worthless. To test the accuracy of my own conclusion I selected five well-marked cases, in two of which it proved successful, though not until it had been given during ten days in gradually increasing doses. In one of the failures it was suspended after ten days' unsuccessful employment, because of the appearance of a papular eruption over the whole surface of the body, attended with constant and excessive itching, which gradually disappeared without treatment. More recently Dr. Didat, of Paris, has used carbolic acid in the treatment of intermittent fever by injecting subcutaneously a solution of the strength of one part of the acid to one hundred parts of water. Four injections are made the first day, three the second, and two the third. Dr. Didat says the fever is always abated by the first operation and frequently cured. The other two are merely a matter of precaution.*

In the treatment of the ordinary sequences of intermittent fever, anæmia, and chronic enlargement and induration of the spleen, quinia and iron, with a proper and nutritious diet, furnish the only hope of successful results. Anæmia is very amenable to treatment; not so, however, with chronic splenic enlargement. Acute enlargement will usually subside with the entire elimination of the malarial poison from the system and the restoration of the blood to its normal condition. These conditions are fulfilled with quinia and iron. In chronic cases the spleen occasionally attains enormous size, half filling the abdominal cavity, compressing the thoracic cavity, displacing the viscera of both cavities, and attended with the various functional disturbances incident to such visceral displacements. In two instances, (the notes of which are in my case-book,) the heart was entirely displaced to the right of the mid-sternal line. In such chronic cases the issue is one of time. Every effort, by means of tonics, quinia, iron, and a nutritious diet, with proper and prudent regulations in regard to exercise and exposure, must be made to restore the general health and the constitution to its normal condition and to maintain it at that standard. Such result being obtained and maintained, time may eventually effect the reduction of the "ague-cake." If relapses of the fever are permitted, or renewed attacks incurred in consequence of a suspension of the treatment or fresh exposure to the causes, the sequences become more obstinate and protracted and less amenable to treatment. A large portion of those seized with the

* The Lancet, January 11, 1873.

fever in the autumn will suffer a recurrence in the spring, and these vernal recurrences are usually much more obstinate than the original autumnal attack. In this latitude the tendency to relapse is very common, and can only be prevented by the daily use of a moderate quantity of quinia, to be combined with iron if anæmia co-exists. In those occasional instances where quinia fails to arrest the paroxysm, the explanation of the failure is to be found in the existence of some of the secondary effects or in some imprudent exposure or habit. In such cases the special cause must be detected and removed, and such general therapeusis adopted as will best meet the indications presented.

Chronic malarial poisoning, in whatever form it may localize itself, is best treated with quinia, iron, and a nutritious diet. It occasionally happens that the characteristic phenomena of chronic malarial poisoning are completely masked by an array of symptoms which may present a well-defined picture of some malady in nowise resembling the real disease; for instance, during the past autumn there were many cases of diarrhœa, with profuse serous stools, which readily submitted to quinia, and which obstinately resisted the remedies ordinarily found efficient in diarrhœa. These masked malarial affections cannot be accurately diagnosticated. The prevalence of malarial disease is suggestive of the complication, but the manifest benefit derived from the administration of quinia furnishes the only point of positive diagnosis.

Article II.

Entero-colitis, Cholera infantum, Dysenteria, and Dentitio difficilis.

As the purpose of this report is simply to present to the reader the points of special interest indicated by the notes of the cases of the different diseases treated, and not intended to be an extended dissertation on the nature and pathology of the diseases respectively, I have, to avoid confusion and repetition, associated these four allied disorders. The three diseases, and, usually, the last, (if it be entitled to a distinctive designation as a disease,) besides other points of similarity, have one symptom—increased frequency of the alvine dejections—common to them all. Authors of very high repute have sought to establish distinctions based upon peculiar characteristics of the stools and locality of morbid lesions; yet all admit that, clinically, it is impossible to determine, with accuracy, the pathognomonic

differences. The local morbid lesions are to be found, more or less defined, in the gestro-intestinal mucous membrane, most usually in the larger intestine. Entero-colitis and dysenteria are nosological terms, intended to represent the precise anatomical locality of some grade of an inflammatory process, having its beginning, if not also its termination, in the mucous membrane of the digestive tube; yet it is not always easily determined where entero-colitis terminates and dysentery begins, or where cholera infantum ends and entero-colitis commences. The choleriform stools of cholera infantum may eventuate in the establishment of either entero-colitis or dysenteria, and if frequent muco-sanguinolent stools, accompanied with tenesmus, abdominal tenderness, and fever, be accepted as pathognomonic of dysentery, many cases running the course of entero-colitis terminate with well-defined dysenteric symptoms. Even so eminent a Pædiatrica as West, of London, recognizes no other difference than the grade of the morbid process.

If the frequent and exhaustive serous and choleraic stools, attended with rapid waste and collapse, define and limit cholera infantum according to the systematic classification of diseases, where can be classed that common form of simple diarrhœa not usually attended with fever or abdominal tenderness? Is not the distinction one of degree rather than of kind?

The term entero-colitis implies an inflammation of some portion of the intestinal mucous membrane. West says the anatomical changes are found "chiefly, though not exclusively, in the large intestine," and that the affection of the small intestine is "secondary and subsidiary" to colitis. J. Lewis Smith found in his 81 autopsies, with a single exception, "lesions indicating inflammation of the mucous membrane of the colon," and "in a large proportion of the cases, also, ilietis." Bouchut discovered constant change in the large intestine, and maintains that the "mucous membrane of the small intestine is the only one of the constituent parts of this organ which participates in the changes of entero-colitis," and, furthermore, that the lesions which it presents are to be found "in nearly all the subjects." Meigs and Pepper "invariably found," in their numerous autopsies of cases of entero-colitis, inflammatory lesions of the large intestine, in some cases limited to it, in others extending to the small, and maintain that it is clearly established that inflammation is much more frequently found in the large than in the small intestine. Notwithstanding these very decided opinions, based

upon post-mortem investigations, experience and observation, affirmed by post-mortem examinations, demonstrate the uncertainty of the clinical distinction between inflammatory and non-inflammatory diarrhœa. For, with all the symptoms of the former present during life, the autopsy may fail to disclose any inflammatory lesion appreciable to the naked eye. In 127 autopsies of children who had died of intestinal diseases, Rilliet and Barthez discovered the characteristic appearances of entero-colitis in 84 cases, which had presented the symptoms of that disease; "in 24, though no symptoms had existed during life, similar changes were discovered; in 19 the signs of disease were present during life, but its morbid appearances were absent." West has enjoyed a similar experience, and Bouchut and Smith have occasionally failed to discover any morbid lesion. M. Bertin in 57 autopsies failed in 4 to recognize any appreciable lesion. And M. Ballard expresses the opinion that children at the breast may have diarrhœa without a trace of inflammation of the intestines. If these be facts, they establish nothing more than that a certain array of symptoms represents, in one class of cases, certain well-marked morbid lesions, and in another class nothing. To seek explanation of the absence of any morbid lesion by ascribing the symptoms to functional disorder, is simply the admission that functional disturbance may eventuate in tissue-change, a fact well established. If hypersecretion, increased peristaltic action, and flux represent in one case functional disturbance and in another some grade of the inflammatory process, analogous reasoning would deduce the conclusion that the latter had its beginning in functional disturbance. If like causes, under like conditions, produce like symptoms, which in one class of cases terminated fatally without and in another class of cases with appreciable lesions, the logical inference would be that the difference was one of degree, and not of kind. Functional activity augments secretion; so does simple hyperæmia; and the two conditions may be correlative phenomena. In catarrhal intestinal inflammation it is perhaps impossible to determine, by the objective symptoms, which is the precedent condition. But the true explanation of these discrepant results lies in the fact expressed in the *failure* of the investigator to find any morbid lesion. I am convinced that further and more accurate research will establish their identity in morbid process.

The simple diarrhœa, so frequently supervening upon irregular, tedious, and difficult dentition, ordinarily harmless in itself, and, perhaps, salutary

in the beginning, not unfrequently, in subjects favorably predisposed by a bad physical condition and improper hygienic surroundings, eventuates in the establishment of one of the more serious forms of intestinal diseases, and possesses, in this connection, no other significance than its causal relation to inflammatory and non-inflammatory diarrhœa. Having its origin, as is almost universally held, in the development of the muciparous follicles of the intestinal mucous membrane, stimulated to excessive activity and increased secretion by the physiological process of dental evolution, during which period, with rare exceptions, cholera infantum seizes its victims, selecting, most generally, those of feeble, delicate, and nervous constitution, the close relationship which the natural process bears to the disease as cause seems to be more than a mere coincident circumstance.

For convenience and comprehensiveness I have classified all the cases of non-inflammatory diarrhœa under the head of entero-colitis. In doing this, I feel fully justified by the additional considerations that the latter is almost invariably preceded by the former, which, from neglect, injudicious, or improper treatment, gradually, and oftentimes imperceptibly, develops the lesions characteristic of one of the more serious forms of disease. Rarely, if ever, does ilietis or colitis mark their inception. Hence, as West says, the distinction between them "is one of degree rather than of kind."

I am seeking to establish the identity rather than the unity of these diseases, and the foregoing considerations show the practical inutility of these classical subdivisions and make apparent the danger of too much reliance upon the names rather than upon the symptoms. Undoubtedly, cases of these diseases occur, typical in their inception, symptoms, and progress; yet the far more frequent commingling of their phenomena renders classification difficult and, to a certain extent, valueless. The causes, symptoms, and course, together with the age, physical condition, and hygienic surroundings of the patient, demand the attention and suggest the appropriate treatment.

Cholera infantum, so well marked by a group of symptoms, more distinctive in their general array than in their separate and pathognomonic significance and more formidable in their concurrent impressions upon the general system than in the special and solitary effect of any one of them, presents in typical cases, the clinical features of a well-defined disease. The sudden onset of the assemblage of symptoms; their marvelous haste

toward decisive and calamitous results; their terrible ravages, speedily expressed in the rapid prostration and exhaustion of the physical and vital powers, would seem to entitle this group to a distinctive appellation, Trousseau, in his graphic delineation of the disease, as it came under his observation, evidently had in view its similarity to Asiatic cholera; yet, holding on to the doctrine, so constantly promulgated by him, and which Bouchut also maintains, that diseases owe their characteristic and distinguishing features to specificity, he maintained that the points of dissimilarity are the "evident stamps of specificity." Its infrequency, as compared, with non-inflammatory diarrhœa and entero-colitis; the occasional absence of appreciable morbid lesions, and, when present, their insignificance as compared to the gravity of the symptoms, and its frequent and direct association with dentition, manifestly point to some constitutional peculiarity as an additional determining cause. This suggestion acquires force from the circumstance, believed to have been first suggested by Dr. J. F. Meigs, that in some families there exists a hereditary predisposition to the disease. More than once I have observed that the children of some families suffered from the graver disorder, while others in the immediate vicinity, and apparently living under less favorable hygienic conditions, escaped disease. The children of some families are never sick without becoming ill.

Dysentery, as nosologically defined, is so rare a disease during childhood, and especially during the earlier years, that some authors have denied its occurrence except as a secondary effect. Bouchut doubts its occurrence, and Vogel asserts that sporadic dysentery frequently occurs in infants. West, Smith, Meigs and Pepper, Trousseau, Tanner, and Ellis recognize the essential fact—the localized inflammation—but fail to indicate any other anatomical peculiarity of the morbid condition. In 1,028 cases of all diseases, I have memoranda of but 14 cases. These were sporadic. Basing my diagnosis upon the presence of fever, abdominal pain and tenderness, tenesmus, and muco-sanguinolent stools, I have felt compelled to separate them from the cases of entero-colitis, though the similarity of causes, conditions of life under which they appeared, and the not unfrequent occurrence of cases of entero-colitis, in which the same symptoms ultimately appeared, strongly impress me with the futility of a nosological distinction. Epidemic dysentery is marked by peculiar phenomena; but as the disease ordinarily appears during infancy and during the summer months, the few

cases being scattered here and there among a number of cases of entero-colitis and cholera infantum—all seemingly living under like conditions—the practical advantages of a distinct classification do not present themselves with much emphasis.

In the large and populous cities of this country the annual epidemics of intestinal diseases are the scourges which decimate the infant population. In this city all combined fall far short of the number of cases of intermittent fever, as shown below :

	Male.	Female.	White.	Colored.	Total.
Per cent. of intermittent fever	23.56	14.66	26.67	12.21	19.06
Per cent. of intestinal diseases	11.76	14.59	12.28	14.01	13.23
Total of all diseases	509	519	487	541	1,028

Recurring to the statistics before me, I find nothing specially interesting or instructive exhibited by a classification of sexes and races, beyond their more frequent occurrence among the females and colored :

	Entero-colitis.	Cholera Infantum.	Dysenteria.	Total.
Male	44	11	5	60
Female	57	10	9	76
White	48	7	5	60
Colored	53	14	9	76
Total	101	21	14	136

When compared, as below, by their percentages to the whole number of each class of patients, the relations shown above vary ; yet in the aggregate the percentages exhibit the same relation of frequency :

	Male.	Female.	White.	Colored.
Total	509	519	487	541
Per cent. of entero-colitis	8.62	10.91	9.85	9.79
Per cent. of cholera infantum	2.16	1.93	1.43	2.56
Per cent. of dysenteria	.98	1.75	1	1.66
Total per cent	11.76	14.59	12.28	14.01

The diseases separately do not follow any constant or general law as to frequency among sexes and races, but in the aggregates they exhibit greater frequency among the females and the colored. This is more clearly

exhibited by the following arrangement, which shows the number of each disease for each year, classified according to sex and color, and the whole number of patients for each year, similarily classified. Thus it appears that the proportion of each disease to the whole number of each class varies in each year:

	Entero-colitis.			Cholera infantum.			Dysenteria.			Whole number of patients.		
	1870.	1871.	1872.	1870.	1871.	1872.	1870.	1871.	1872.	1870.	1871.	1872.
Male	22	16	6	7	3	1	4	1	.....	182	236	91
Female	20	30	7	3	7	.....	6	2	1	179	263	77
White	26	14	8	4	2	1	2	2	1	188	236	63
Colored	16	32	5	6	8	.....	8	1	.....	173	263	105
Total	42	46	13	10	10	1	10	3	1	361	499	168

These negative results are corroborative of the suggested identity of the three diseases. Meigs and Pepper think cholera infantum more frequent among the males. My statistics sustain this opinion, but the aggregate percentages show that the female sex is more liable to the diseases.

	Male.	Female.
Per cent. of cholera infantum	2.16	1.93
Aggregate per cent. of the three diseases	11.76	14.59

Dysentery exhibits an excess among the females which may be accounted for by the greater number of female patients, or, perhaps, by inaccuracy in the differential diagnosis, which latter circumstance might depreciate my standing as a diagnostician, but would, presumably, affirm the similarity of the diseases, at least in their symptomatic and objective phenomena.

The greater frequency of the diseases among the colored may, perhaps, find its explanation in the greater number of illegitimate births, and the consequent neglect and improper diet and feeding. Mothers, without husbands and means of support, are frequently compelled, to obtain "service" among respectable and well-to-do families, to board their infants with those who pursue such business for a livelihood, only giving them the breast during a hurried visit morning and evening. During the intervals the child is frequently insufficiently and improperly fed. Numerous such instances have come under my observation, and Bouchut makes mention of the fact that, in Paris, non-inflammatory diarrhœa is very prevalent among the infants of mothers who,

"obliged to work in order to sustain their existence, quit their infants in the morning, return at several moments of the day to give them the breast." Apart from any consideration of the physiological or constituent alterations which may be induced in the mammary secretion, by the mental disquietude growing out of the conviction of moral turpitude or the privations of poverty, the "disagreement" of the milk with the child, so frequently the alleged cause of the early weaning so generally practiced by these "at-service mothers," may find its explanation in the watery condition of the milk, which has been shown, by M. Peligot, to be proportionate to the length of time it has been retained in the breast. Upon the consequences of this partial weaning, and the subsequent improprieties of the feeding, I need not now dilate.

The influence of lactation, both natural and artificial, in the causation of infantile intestinal diseases, is far too frequently overlooked by the careless practitioner. Milk is the natural aliment of young animals, but the nursling is very frequently fed exclusively upon milk wholly deficient in the necessary nutrient and healthy constituents, and, indeed, often upon it when it is diseased. In this *résumé* of the causes I cannot venture to discuss this subject *in extenso*, and might well content myself with a simple reference to the very full and instructive works of Routh on "Infant-Feeding," and Donné on "Mothers and Infants," but I desire to impress the young practitioner with the importance and, in many instances, with the imperative necessity of searching for the cause in the habits, mode of life, and diet of the mother, and in the manner and frequency of nursing the sick infant. It is not only necessary to ascertain that the secretion is healthy in quality and that it comes up to the proper standard in its normal constituents. The deleterious influence upon the lacteal secretion of sudden bursts of passion, of a nervous temperament, of menstruation and pregnancy, of excessive sexual indulgence, of irregular habits of life, and of certain articles of diet is too well established by clinical observation, if not by chemical analyses, to be considered as mere coincidences unworthy of the attention and investigation of the scientific physician. Dr. Decaisne has recently (London Lancet, September, 1872) shown that insufficient food may occasion very serious and varied disturbances of the quality of the milk. In his report to the Académie des Sciences of the results of his observations of forty-three women who nursed their infants during the siege of Paris, he deduced the conclusions that some women

may, upon insufficient diet, produce abundant and rich milk, and their children will thrive, while they themselves will emaciate; another class will produce but little milk, and that very poor, and their children will suffer for want of nutriment and sicken with choleraic diarrhœa, and a third class will produce scarcely any, and their children will die. In syphilitic mothers the proportion of sugar is diminished and water increased in the milk; fever lessens and may suppress the secretion; emotion, mental anxiety, and sorrow may diminish and also render it poisonous; puerperal fever seriously disturbs its healthy qualities; insufficient air, sedentary habits, and want of cleanliness not unfrequently impart to it conditions injurious to the health of the nursling. Certain drugs administered to the mother may affect the infant. Iodine can be detected in the milk; mercury given to syphilitic mothers will be conveyed to the child; opiates and some purgatives will demonstrate their physiological influence upon the sucking infant. All these circumstances, and many others, present considerations which demand the careful attention of the practitioner, and should not be overlooked in the study of the causes and in the application of remedies.

Without attempting to enumerate, in detail, the long list of causes so universally recognized as contributing to the production of these diseases, I will venture to suggest a few considerations. Whatever may be the influence of bad atmosphere and bad hygiene, something more than an elevated temperature, filthy streets, squalid lodgings, and personal uncleanliness is necessary. Neither of the three diseases is peculiar to the children of the poor, or of the habitants of the narrow and foul alleys, or of the dwellers in the illy-ventilated and stinking tenements of populous cities. They invade the palaces of the rich, the fashionable thoroughfares, where dwell the families of leisure and affluence. Nor with all the care and vigilance of the health-officer, nor with the lavish expenditure of the accumulated wealth of the millionaire, can they be shut out from the nurseries of populous cities, however cleanly, comfortable, and luxurious the apartments may be. Nor are they exclusively confined to the illy and improperly fed, to the early weaned, the harshly treated, or the imprudently exposed, for all these causes are, presumably, of as frequent and constant occurrence during the winter as during the summer months; yet it is during June, July, August, and September that the wide-spread epidemics annually occur. From the extensive table of Meigs and Pepper, showing the monthly mortality in Philadelphia during

the years 1862, 1863, 1864, 1865, 1866, 1867, 1868, from cholera infantum, dysentery, and diarrhœa, during the first five years of life, compared with the total monthly mortality from all causes, and the mean monthly temperature, I have collated the following tabulated statement:

Months.	Mean monthly mortality for seven years, from 1862 to 1868, both inclusive.			Mean total mortality for seven years.	Mean temperature for seven years.
	Cholera infantum.	Dysenteria.	Diarrhœa.		
					°
January	1 1-7	2	3 3-7	1,296 5-7	30.87
February	1 5-7	2 1-7	1	1,206 5-7	33.89
March	2 2-7	1 1-7	3 2-7	1,344 2-7	40.85
April	4	3	3 5-7	1,281 1-7	52.27
May	7 4-7	2 2-7	4 3-7	1,234 2-7	62.77
June	67	6	9 6-7	1,178 1-7	71.97
July	358 3-7	24 2-7	34 1-7	1,837	77.71
August	304 2-7	27 2-7	29 1-7	1,825 3-7	76.62
September	77 2-7	13	11 4-7	1,215 3-7	68.31
October	21 5-7	4 6-7	6 4-7	1,218 1-7	56.3
November	31	2 2-7	2 5-7	1,052 1-7	46.68
December	9	1 4-7	2 4-7	1,191	34.7

Thus it is shown that elevated temperature is not an essential element of the cause. Rare in sparsely-populated localities, rarer still in elevated regions, they are rarest when to these conditions is added aridity. Occasionally occurring in the farming regions, more frequently in the country villages, as a wide-spread epidemic in populous and compactly-built cities, they become the scourge of infant-asylums and homes for foundlings and the houseless. Then to the numerous causes of bad air, foul with the exhalations from decaying animal and vegetable matter; to the many improprieties of diet; to the injudicious feeding; to the causes and effects of malnutrition; to the elevated temperature and personal neglect, must be added the conditions of moist atmosphere, of lowness of situation, and of the congregation of a number of individuals within a limited area, to complete the series of causes and fill full the measure of the endemic requirements. But, after all, these are but coincident and accessary influences. Numbers, even among those most exposed to these various elements, escape, and the diseases, to a limited extent it is true, do appear where all these conditions of atmosphere, locality, congregation of individuals, privation, and uncleanliness are absent. Their nature and causes, like the diseases themselves, are so intimately blended that the physiological and anatomical peculiarities of

infancy and childhood must be studied in order to reach a solution of this complex and intricate problem. The first quinquenniad comprises the years during which disease is most frequent and mortality runs highest. According to the report of the registrar-general, (England,) nervous diseases share the highest mortality under one year of age, the respiratory second, and digestive third. Under five this order is changed as regards the first and second, the mortality from the diseases of the digestive organs being far less than from either of the other during each period. West furnishes the following statement (deduced from the reports, fifth and eighth—for 1842 and 1845—of the registrar-general) of the proportion per cent. of deaths from the diseases named, in childhood, as compared with the total mortality from all causes, in London:

	Under 1 year.	Between 1 and 3.	Between 3 and 5.	Under 5.
Percentage from diseases of the nervous system . ..	30.5	18.5	17.6	24.3
Percentage from diseases of the respiratory system	26.9	39.5	33.0	32.8
Percentage from diseases of the digestive system...	17.5	12.8	5.5	14.1

This order of precedence in the mortality establishes, in the consecutive diminution of the mortality from the nervous and digestive diseases during the same periods of life, a direct connection between their causes and the causal effects, or rather a connection in physiological tendencies and sympathies. This is further illustrated by a similar comparison during the advanced periods of childhood, (also from West:)

	5 to 10.	10 to 15.	All ages above 15.
Percentage from diseases of the nervous system . ..	15.1	10.6	10.4
Percentage from diseases of the respiratory system.	29.5	30.7	38.0
Percentage from diseases of the digestive system ..	6.5	8.8	7.7

If these statistics prove anything, they establish, at least by inference, the intimate physiological and pathological relation of the diseases of these two systems. They act and react upon each other as cause and effect. Not so with the respiratory affections. Though less frequent than the nervous diseases under one year of age, in all subsequent periods of life they are more frequent. The first quinquenniad is also the period of most rapid growth of the tissues, of the physical and functional development of organic life, and of cumulative nutrition. During these years of rapid

growth and marked pathological tendencies, the machinery of life runs with delicate precision and amazing celerity, assimilating nutriment for the store-house of growth. The child, like the swift-growing and succulent plant, exhibits in the softness and delicacy of its tissues, in the looseness and tenderness of its structure, in its sensitiveness to impressions, and in its pathological tendencies, the hasty appropriation of the elements of nutrition and feeble powers of resistance to the accidents and improprieties of life and to the ever-varying changes of the natural elements. It is, furthermore, during this period that the first dentition runs its successive series of somewhat singular events, strangely commingling physiological and pathological phenomena. Various local irritations and general disturbances may mark the evolution of the teeth. Meigs and Pepper assert that they "have rarely observed cholera infantum before the beginning of the process of dentition and very rarely after its completion." J. Lewis Smith says "it usually occurs under the age of two years." In 282 cases in which the observations were made, 47 had no teeth and 28 had all the teeth. The statistics of Dr. Emerson show that it is more fatal in the first year than in the second, thus contrasting the causal influence of the very rapid growth of the first year with the more active and continuous dental evolution of the second. In 138 children at the Necker hospital, laboring under the first dentition, Bouchut says 26 were free from all indisposition, 38 had transient diarrhœa, 46 had abundant diarrhœa; in 19 it appeared at the time of swelling of the gums and ceased with it to re-appear with the eruption of the teeth. Vogel, who confounds entero-colitis with cholera infantum under the term catarrhus intestinalis, says "in children over one year of age the process of dentition is the most frequent cause," and "that the ordinary simple looseness of the bowels, which usually accompanies dental evolution, may become cholera-like and prove fatal in twenty-four hours. West, who classifies the three diseases under two divisions of diarrhœa—simple or catarrhal, and inflammatory or dysentery—deduces the general conclusion "that the greatest prevalence of diarrhœa or dysentery coincides exactly with that time during which the process of dentition is going on most actively," and asserts that half of his cases (2,129) occurred between the ages of six months and two years. J. Lewis Smith concludes from his 576 observations that infants "under the age of six months are less liable to entero-colitis than between the ages of six months and two years. Bouchut

asserts that "the influence of the dental evolution upon the diseases of the alimentary canal is completely established." So constant and active an influence does Trousseau consider dentition, that he insists that weaning should not be completed prior to the evolution of the fourth group, and that it should never be terminated suddenly, but gradually. Eustace Smith says the bowels are, during dentition, "ripe for diarrhœa," because of the augmented irritability, growing out of the increased development of the follicular apparatus; but, "without the presence of the ordinary exciting causes, diarrhœa is by no means a necessary result of such a condition of the alimentary canal."

My own observations, covering 120 cases, in which the records were accurately kept, give the following results:

The three diseases: one year of age and under, 39; one to three inclusive, 56; three to five inclusive, 13; over five, 12.

Of the 39 one year old and under, 9 had no teeth, of which 6 were from five to eleven months old, and 3 were under the age when it is supposed the process of dental evolution has actively begun. Among the second class 1 one year and 1 fourteen months old had no teeth. Of the 56, 11 had completed the first dentition. Of the third class all had completed the first dentition. In 87 cases, dentition had either begun or was in active progress; in 3 it had not commenced, and in 36 it had been completed. It seems, then, fair to conclude that nearly two-thirds of all the cases occur during the period of dentition; hence its influence as a predisposing cause can be readily appreciated. Bouchut thinks the swollen condition of the gums determines increased peristaltic contraction of the intestines, through the nervous irritation set up, and that the inflammatory state of the buccal mucous membrane is extended to the intestinal mucous membrane, both conditions thus uniting in the cause. "Besides this influence of nervous irritation in quickening for a time the peristaltic action of the bowels, and thus inducing diarrhœa," West holds that "all parts of the digestive canal, and of its dependencies, are undergoing active evolution to fit them for the proper assimilation of the varied food on which the young being will soon have to subsist." These explanations, undoubtedly true in themselves, are not entirely satisfactory. That deviations from the normal course of dentition should produce other morbid conditions seems reasonable; but that a purely physiological process should be

so uniformly complicated with serious pathological conditions seems a contradiction. The fact that these concomitant and consequent morbid conditions are peculiarly incident to a certain season of the year, and to a life in the cities, certainly detracts from the intensity of its influence as a cause.

It is a very common, perhaps too prevalent, habit among medical men to ascribe all intestinal disorders to indiscretions in diet, and to insist upon such errors, notwithstanding the pertinacious denial of the patients or their friends. The indiscretion, if such it can be called, not unfrequently consists in some temporary or accidental disturbance of the digestive and assimilating processes, and these latter conditions may find their cause in functional and structural alterations of parts remote from the alimentary canal.

The frequency of these allied affections during infancy and childhood, bearing, apparently, a direct relation with the frequency of the diseases of the nervous system, and their rapid diminution in frequency with the advance of life, corresponding with the lessened frequency of the nervous disorders, point, with unmistakable significance, to two important factors: age and the physiological and anatomical peculiarities of infancy. Without intending to depreciate the sad effects of the accessary and co-operative influences, bad air, unwholesome diet, improper exposure, and the numerous other alleged causes, I must insist that an exaltation of nervous irritability and an augmented delicacy of nervous susceptibility, or, rather, that functional and organic derangement of the nervous system, or some part thereof, constitute an important element of causation. Trace the history of the disorders through all their varied phenomena, and each objective adds corroboration to this conclusion. The period of life during which the nervous system manifests, with peculiar energy and force, its pathological tendencies, furnishes, by far, the largest quota of patients. Dentition, with its various nervous excitements, febrile exacerbations, and local irritations, adds its contingent. Feeble development, with marked nervous irritability, temptingly invites local intestinal disturbances. Residence in the city, none the less so because of the filthy streets, foul exhalations, and densely-populated area, with its constantly recurring scenes of excitement, and its advanced society-regulations, no less detrimental to adult than to infant health, is a fruitful source of nervous as it is of intestinal disorders. Nervous enervation and prostration, so frequently the result of continuous exposure to a high temperature, find their sequences in digestive and nervous disturbances. How marked the

contrast! In the sparsely-populated and elevated regions these disorders are rare visitors to the family nurseries of the country residents, yet growth and development go on. Dentition runs its regular course comparatively free from the reflex and sympathetic phenomena. The sedation of the pure and invigorating country air, of the quiet and physical life of the farming-regions, rather than the exciting, irregular, and stimulating life of the city, is the great preventive of nervous as it is the great curative of the intestinal diseases of childhood. The physique and pathological aptitudes of the young permanently residing in the cities are so markedly in contrast with those of the rural districts that the manner and circumstances of life peculiar to cities, in prematurely stimulating functional development, especially of the nervous system, constitute a far more important factor in the causation than the normal physiological and anatomical peculiarities of infancy and childhood.

Intestinal diseases among children in the farming-regions are, in a very large majority of the sporadic cases, attributable to the ingestion of articles of diet altogether improper. Berries, green peas, new potatoes, and fruit of all kinds are rarely absolutely forbidden, even during the period of dentition, to children in the remote country districts; and those who have had the opportunity of treating such diseases among the former slaves, even among those who were huddled together in illy-constructed quarters, cannot have failed to observe how rare these disorders were among them, and, in the occasional instances, to trace them to improprieties of diet. The familiar dinner-scene, at the plantation-quarters, of a child, perhaps several, being stuffed with the masticated food from the parents' mouths, not only without detriment, but as the sure promoter of health, strength, and growth, has impressed me with the conviction that there is an immunity from disease which belongs exclusively to children permanently residing in the agricultural regions. This practice, so customary among the slaves, of feeding the child with morsels of food already masticated, though repulsive to cultivated sensibilities, suggests a method of preparing food worthy of intelligent trial. Among the poorer classes of country residents it is the common habit to feed young children from the family table, and only among the cultivated families are dietary regulations stringently enforced, and among this latter class disease is most common. Through these gradations of society the diseases peculiar to infancy and childhood regularly ascend the

scale of frequency. Why this is so I know not, unless cultivation, refinement, and luxury multiply and accelerate the pathological aptitude. That this is true with regard to disorders of the nervous system is, I believe, generally conceded; and in this circumstance the relative frequency of digestive disturbances may find its explanation. To Rilliet and Barthez is perhaps due the credit of having first suggested, especially in regard to cholera infantum, the relation of the nervous to digestive disturbances, as cause and effect. I forbear to follow these distinguished authors in their definite tracing of the precise nervous influences and changes which may determine the enteric disease.

The disturbance of the normal relation subsisting between the skin and intestinal mucous membrane is another important element of causation. This fact has been universally conceded by writers upon the diarrhœal complaints of adults, but among Pædiatricas it is only casually enumerated in their multitudinous array of influences. The physiological antagonism between the cutaneous and intestinal secretions is so manifest that it is not difficult to understand why the suppression of the former should determine an alvine flux. It may not only impose additional functional activity upon the intestinal mucous membrane, to relieve the system of accumulated fluid, but also to effect the vicarious elimination of effete matters; and thus local irritation, hypersecretion, increased peristaltic action, and alvine flux may find their immediate and direct cause. The manifest effect of the sudden arrest of the cutaneous transudation, as the most frequent cause of the cases occurring during the autumn, winter, and spring months, is apparent, even to the most casual observer; and I apprehend that it is far more frequently the immediate influence during hot weather, especially in moist localities and during rainy seasons, than is generally believed. I have uniformly observed an accession of disease and frequent relapses following the sudden and violent lessening of temperature which so frequently terminates our brief "heated terms," and more especially so if accompanied with moist and rainy weather. Trousseau has called attention to a form of diarrhœa denominated "sudoral," which he intimates most frequently occurs among children, and differs from that arising from suppressed perspiration, inasmuch as both secretions are simultaneously abnormally increased from excessive heat. How far such sympathetic augmentation of these secretory functions may enter into the causation of infantile intestinal diseases I am

not prepared to determine, but their occasional simultaneous occurrence cannot be denied.

Conceding the analogy of causes, the distinctive natures of the diseases will be recognized and maintained so long as the pathological lesions are regarded as peculiar and characteristic. Whatever may be the local morbid phenomena, they are admitted to have their localized beginning in the intestinal mucous membrane. If, then, the tissue diseased is common to all of them, the clinical distinctions must be due to some peculiarity of locality, or of the morbid process, or to the localization of the disease in some one of the histological elements of the structure involved. No one will for a moment maintain that entero-colitis is anything more than an advanced stage of catarrhal diarrhœa, or that the ordinary non-inflammatory diarrhœa is anything less than an irritation of some part of the intestinal mucous membrane, preliminary to more manifest morbid conditions. The morbid process, the structure involved, and the pathological lesions which complete the picture of dysentery, present no other distinctive feature than locality, and this is very often only descriptive. Cholera infantum, singularly distinctive in the suddenness and intensity of its phenomena, differs from a more frequent, milder, and more tractable form of serous diarrhœa in the degree of exhaustion and copiousness of choleraic stools. The concomitant conditions and circumstances which enter into and complete its history—pertain more directly to the individual peculiarities and to the stage and condition of development than to any essential difference of nature. Exhaustion, which after all is the alarming symptom, is more frequently the result of deficient constitutional vigor and defective nutrition than of the extent and intensity of the morbid process. The graver forms terminate speedily in death, the milder in the establishment of some grade of the inflammatory process. In one, life submits to exhaustion; in the other, life resists. Is not the difference then simply one of degree and duration, and not of kind? Entero-colitis and catarrhal diarrhœa differ only in degree; dysentery and entro-colitis, according to their nosological designation, only in locality, and, clinically, only in the presence of symptoms indicative of some grade of the inflammatory process located in the mucous membrane of the lower bowel. I am aware that there is a form of dysentery which has so frequently decimated European armies, which, in its clinical history and pathological anatomy, differs essentially from that morbid process which I am now dis-

cussing. Occasionally sporadic cases occur among children, but they bear no relation to the summer-diseases of infancy and childhood.

I believe that the morbid process common to these allied disorders is inflammation, varying in intensity and running through all the gradations, from simple irritation and inflammatory hyperæmia to ulceration and gangrene.* I do not propose to minutely detail the morbid lesions so elaborately described by authors who have made the subject a study, but, in view of the consideration sought to be established in this discussion—the identity of the morbid process—I will briefly refer to the few points upon which their separate and distinct natures are based.

The first and important point in this connection is the occasional absence of local lesions, and the assumption that in such cases the disease is one of functional disturbance. The fallacy of this mode of reasoning and of the conclusion is obvious. The exceptional cases are far too meager, in view of the immense number of the cases, to establish any distinction when the symptoms and causes are identical. In all cases where local lesions have been discovered, they have been recognized as the manifest phenomena of some stage of the inflammatory process, and it is far more rational to conclude that the absence of any such phenomena is to be ascribed rather to the failure of the observer than to a difference of kind. Until such cases are subjected to thorough microscopic examination by competent microscopists and the negative clearly established, all conclusions are obviously fallacious. The attempt to explain and establish a distinct kind of disease upon the hypothesis of functional activity or disturbance, is simply an admission that there is a stage of the morbid process in which the lesions are not cognizable to casual observation. The history of the fatal cases in which no lesion has been recognized clearly establishes one fact: no one can positively and invariably determine, during life, the presence or absence of local lesions. In many cases the gravity of the symptoms bears no relation to the extent of the inflammatory condition, and, in a vast majority of cases, the duration of the disease is the only circumstance determinate of its grade and extent. Niemeyer says "the anatomical changes left in the *cadaver* by acute catarrh are sometimes pale, at others dark redness, swell-

* It is perhaps proper that I should qualify this declaration, inasmuch as it has occurred to me that further research will establish an important distinction, based upon exemption or implication of Peyer's glands in the morbid process.

ing, relaxation, and friability of the mucous membrane, which is sometimes diffuse, at others limited to the vicinity of the solitary glands, and a serous infiltration of the sub-mucous tissue. Occasionally, after death, the injection has entirely disappeared, and the mucous membrane appears pale and bloodless. Swelling of the solitary glands, and glands of Peyer, is an almost constant appearance; they distinctly project above the surface of the mucous membrane. The mesenteric glands also are usually found hyperæmic and somewhat enlarged. The contents of the intestines consist, at first, of plentiful serous fluid, mixed with detached epithelial and young cells, subsequently of cloudy mucus, which is adherent to the wall of the intestine and contains epithelial structures." Dr. J. J. Woodward, in his work on camp-diseases, though adhering to the established nomenclature of these allied affections as they appeared among adults in the Army, clearly foreshadows the opinion that the nosological distinctions is merely an arrangement convenient for study, and not conclusive of distinct morbid processes. He says simple diarrhœa is usually "the (page 216) result of irritation of the intestinal mucous membrane," "expressing itself in increased secretion throughout the intestinal tract." "The irritation may even amount to inflammation." And at page 251, after minutely describing the histological lesions to be found in chronic diarrhœa, he concludes with this expression: "There can be little doubt that this affection is to be regarded as consisting essentially of a chronic inflammatory process, involving primarily the mucous membrane of the ilium and colon," with a tendency to ulceration. The advocates of the distinctive nature of cholera infantum mainly rely upon the absence of morbid lesions or, when present, their proportionate insignificance to the gravity of the symptoms. The manifest error of this process of reasoning consists in the attempt to measure the intensity of the symptoms by the extent of the local intestinal lesions, without any consideration of the concomitant conditions and constitutional peculiarities under which this form of disease usually appears. It is a well-established fact that in all these forms of intestinal disease, peculiar to infancy and childhood, the gravity of the symptoms bears no constant relation to the extent or degree of the pathological lesions. Omitting any consideration of the clinical fact that this form is frequently the preliminary stage of the inflammatory, the lesions observed in cases proving fatal in the acute stage establish its inflammatory nature. These are, according to

Meigs and Pepper, "enlargement of the mucous follicles and, to a less degree, of the glands of Peyer, and softening, and in some cases erythematous inflammation of mucous membrane." "These appearances," add the same authors, "depend upon the presence of an early stage of inflammation of the tissues of the intestinal walls and of the mucous follicles;" and that the inflammatory process is similar to that found in entero-colitis is clearly established by its frequent eventuation in the lesions usually found in primary entero-colitis. In the opinion of Rilliet and Barthez, cholera infantum is a catarrh localized upon the digestive tube and great sympathetic nerve. "Its catarrhal nature is demonstrated by the causes, which are those of all catarrhs, (improper alimentation, epidemic influence, &c.;) by the analogy of the symptoms; by the gradual passage of the mild into the grave forms, through intermediate causes; and lastly by the fact that simple intestinal catarrh is often but the prodrome of choleriform enteritis." Rindfleisch says "the relations are different in very many catarrhs of the gastric and intestinal mucous membrane. The ordinary diarrhœa-stools depend upon a serous transudation in the region of the small intestine. The blood-serum, with albumen and salts, has passed from the vessels of the villi directly to the surface, and is carried down the intestine by strong peristaltic movements so rapidly that resorption in the large intestine cannot keep pace with it. The cholera-catarrh distinguishes itself from ordinary diarrhœa, on the one hand, by the exclusion of albumen from the transudation; the choleraic transudation consists entirely of common salt and water, (Schmidt;) upon the other by the participation of the whole tract, from the cardia to the anus; finally, by the enormous quantity and rapidity with which the transudation ensues. The rapidity, especially, is so great that the epithelium of the small intestine, together with the epithelial lining of the glands of Lieberkuhn, is lifted off and washed away in larger and smaller shreds. Meal-soup or rice-water stools."

In this cursory examination of the causes, nature, and morbid anatomy of these allied disorders, I have endeavored to trace, accurately and fairly and comprehensively, their similarity, and to establish the conclusion that their distinctions are in degree, and not in kind. There is nothing new or original in this view, but it possesses the merit of directing the attention immediately to the urgent symptoms and fastens upon the practitioner the importance of seeking explanation of the varying phenomena in conditions peculiar to the patient, rather than in differing and distinct morbid processes.

In discussing the nature and causes, I have so fully indicated my views in regard to the methods of prophylaxis that I need not dilate upon this interesting topic. The influence of locality, of "crowd-poisoning," and of the bad hygiene of cities can be either entirely avoided or materially modified by temporary removal of residence. Diet, personal cleanliness, exposure, and clothing appropriately belong to the judicious management of the nursery, and, except among the poor and ignorant, when either, from improper management, become the cause of disease, it is, generally, the result of wanton neglect upon the part of parents. The influence of age is one rather to be endured under careful dietary and hygienic regulations, and every wise provision should be made to promote growth and development and to maintain at the normal standard the physical condition.

In regard to diet, I have nothing special to say, beyond giving expression to my firm conviction that milk is the only suitable article. To the nursling natural or artificial lactation, to the weaned a diet of pure and fresh country grass-fed cow's milk.* Farinaceous articles and compounds are, at best, miserable substitutes, and frequently injurious expedients. In occasional cases, where milk disagrees, usually because it is poor in quality, badly preserved, or improperly fed, some one of the farinaceous preparations—those in which milk is a constituent only should be allowed—may temporarily supply immediate necessity, but the milk-diet should be restored at the earliest practicable opportunity. The recent experiments and researches by Dr. Prospero Sonsino, (London Practitioner, September, 1872, p. 155,) if true, clearly establish the fact that starchy aliments are indigestible, in consequence of the absence of digestive power in the salivary, pancreatic, and enteric juices of young animals. This conclusion is corroborated by the facts that milk contains no starchy element, and that the young herbiverous animals are exclusively nourished upon milk for a limited period. Sonsino's experiments were made by taking from a recently-killed young animal the pancreas, which was hashed and reduced to the consistence of pap. A small quantity of pancreatic infusion, made with distilled water, was dropped upon "the glue

* It is important that the milk should be fresh, for every minute that elapses after the milk is secreted, or drawn, deteriorates the emulsification, and, whether retained in the lactiferous ducts or in artificial vessels and allowed to cool, such changes take place as may destroy the natural emulsification.

of starch," which failed to transform the starch into glucose, thus establishing the condition of "physiological dyspepsia in infants for starchy aliments." Fresh pancreatic emulsion, prepared from adult animals, produces the transformation almost immediately. The same author asserts that not only are starchy aliments indigestible, but they are deficient in "materials for the reintegration of the principal tissues, which is so necessary to the growing infant."

More recently Dr. Sonsino has published (London Practitioner, January, 1873, p. 11,) the details of a series of investigations, instituted "in order to bring forward not merely more evidence of the existence of that dyspepsia, but to establish also, if possible, the limit of age in which it ceases." The researches were made at the East London Hospital for Sick Children and were "directed to the examination of the stools of infants that were fed with starchy aliments, with the object of recognizing if they contained unaltered starch." The stools were examined with iodine as a test for starch and with the microscope to detect starch-granules. The number of investigations were too few to be accepted as conclusive, but they go to show that some children can digest a limited quantity of starch, while others fail altogether. The doctor gives the following table of the results of the experiments in regard to the second question:

Age.	No. of cases.	Results.
3 to 5 months	4	Starch in motions.
10 months	1	Starch in motions not quite clear.
12 to 16 months	3	No starch in motions.
3 years	1	Starch in large quantity.
5 years	1	Starch in small quantity.

Dr. Dobell (London Practitioner, October, 1872, p. 234) insists that pancreatic emulsion possesses, also, in a very high degree, the property of promoting the digestion of fats, and thus combining the two properties of transforming starch into glucose and promoting the assimilation of fats, the latter quality being the more valuable, for the reason that starchy aliments, even when rendered easily digestible, are not proper articles of diet of young animals. With children who have teeth, I prefer some form of concentrated animal food—beef-essence or raw beef—to any of the farinaceous articles or compounds. The great and important consideration is to maintain healthy normal nutrition and to prevent and supply waste. In chronic cases suffi-

cient and assimilable nutriment is the conservator of life. The indications which pertain to diet, hygiene, and the ordinary conditions of the general management of children being fulfilled, in a large proportion of acute cases little else is needed. Medicine may be a source prolific of mischief as well as a means of cure. Experience has satisfied me, not only of the inutility, but of the impropriety of calomel. Commencing practice with full confidence in the efficacy of this chemical, I have been driven, by the sad experience of many failures, to abandon, except in occasional cases, its employment. If the morbid lesions are understood and medication is to be based upon the teachings of pathology, surely mercury is contra-indicated. The proneness to exhaustion and waste cannot be combated with calomel, for certainly its constitutional operation is to exhaust, to lessen strength, to consume, to depress, to favor all adynamic tendencies. If useful, it is through its alterative, purgative, or cholagogue action. The very nature of the diseases clearly contra-indicates any demand for alteratives, and morbid anatomy has failed to reveal conditions calling for its cholagogue action. As a purgative its place can be supplied, and surely no one will maintain that mercury will correct acidity, arrest serous exhalation from the alimentary mucous membrane, diminish peristaltic action, promote appetite, invigorate digestion, arrest waste, or stimulate the failing powers of life. If neither lesions nor symptoms demand its use, its employment must be empirical. That it will occasionally allay gastric irritability and stop vomiting, when all things else seem to fail, I admit; but is the effect not due rather to its mechanical than therapeutic operation? The failure of remedies to allay gastric irritability is frequently not so much due to their inappropriateness and inefficiency as to their bulk and careless administration. One or two doses may be retained and the third will occasion immediate emesis, not because the medicine is any less effective, but because of the addition to the contents of the stomach. How often it happens that the stomach will tolerate small pieces of ice, or even spoonfuls of pounded ice, and, so soon as the liquid contents reach a certain bulk, will reject the whole. Mercury, through its diminished bulk, secures what the stomach most needs, rest. That it may possess and exercise some sedative influence upon the gastric mucous membrane I am not prepared to deny. If so, it must operate locally, and not through the system. Such being the case, I cannot comprehend how the very minute quantities given can cover the entire irritated sur-

face of the mucous membrane and thus arrest hypersecretion, or how, when once in the stomach, it can be determined toward its local sedative effect upon remote parts of the intestinal mucous membrane and fail to enter the system, and thus exercise its very injurious constitutional effect. I cannot tell how, but experience and observation teach me that mercury does promote increased flow of the biliary secretion, and that the surest way to obtain its constitutional effect is to administer it in frequent small doses. How its local sedative action can be obtained independently of its constitutional and cholagogue operation I cannot understand, and do not believe. Take, for illustration, a case of congenital syphilis; give to the patient minute doses of mercury and the constitutional and alterative effects are soon manifest, sometimes before there is any evidence of increased biliary secretion. If the specific action of mercury in the treatment of syphilis be accepted as the criterion by which its *modus operandi* is to be determined, then the conclusion is obvious that its curative value in infantile intestinal diseases is through its action upon the system. The mercurialist must accept this explanation and seek to demonstrate that this alterative action fulfills the indications presented in infantile intestinal diseases.

The indications to be met in the medical treatment are gastric irritability, increased peristaltic action, hypersecretion of the mucous membrane, serous exhalation from the intestinal mucous membrane, acidity, pain when present, exhaustion, loss of appetite, indigestion, and the consequent local lesions. It is important to determine the succession of these phenomena, because effects become concomitant causes. Nausea and vomiting may occur under very different conditions. As the effect of the ingestion of improper articles of diet or of impaired digestion, they usually take precedence of the other symptomatic phenomena. As reflex or sympathetic phenomena they supervene upon intestinal irritation and become continuous with the more marked morbid conditions. Increased peristaltic action, with fœcal discharges, if not co-incident with, is usually consecutive to gastric irritability. Hypersecretion, serous exhalation, and acidity occur subsequently to these conditions, but as a universal law there is no definite order of sequence. Several may occur simultaneously and each become an influence promoting and impelling onward the morbid process; hence the preliminary condition may be concealed by the graver secondary effects; and, as these become concurrent and co-operative morbid conditions, the therapeutical applications

must be adapted to combat symptoms as representatives of both causes and effects. Grave inflammatory lesions succeed the lesser and milder effects, though the immediate cause, perhaps the ingestion of some crude and improper article of diet, had ceased to offend because of its expulsion through the anus. Simple looseness of the bowels, expressed either in increased frequency, greater quantity, or loss of consistency of the stools, is a secondary effect, representing some morbid process, and its cure cannot be assured simply through removal of the offending foreign substance from the digestive tube or by exclusively attacking the process and act of evacuation. Yet so long as the offending material is permitted to remain in the canal, or the peristaltic action continues with increased frequency and energy, the local lesion, in itself an effect, though operating as a cause, cannot be successfully treated. The local morbid condition, in a vast majority of cases, perhaps in all, is some stage of the inflammatory process, varying in intensity and extent from simple irritative hyperæmia to extensive destruction of tissue, manifesting itself in an array of symptomatic phenomena, each one of which becomes an exciting cause. Admitting, for the sake of argument, that hypersecretion may result from functional activity, continuous functional activity will surely produce organic alterations. If to arrest the flux is to cure the disease, why is death so often, especially in the choleraic form, preceded for hours by a partial or complete cessation of the diarrhœa, and why, even in the milder forms, is the diminution in the frequency and quantity of the stools so frequently the premonition of a fierce relapse? Yet it would be worse than folly to attack the inflammatory process with antiphlogistics, while its effects, the manifest phenomena, are permitted to run on with unabated intensity. While the source is being dammed up, the stream of life may run dry. The great principle that underlies the science of cure—the tendency of inflammation toward resolution and health—should not be forgotten or overlooked. Few children die of these diseases before they are consumed. Life feeds so long as there is food to supply its demands. Inanition and exhaustion are the ominous harbingers of death. Waste must be supplied, assimilable nutriment must be furnished, nutrition must be restored. Instead of bringing milk, jostled, churned, watered, and otherwise injured, to the child, carry the patient to the cow, to the country, not to the scantily-supplied and "crowd-poisoned" village or road-side boarding-house, but to the farm-house, where milk, pure and fresh, and air rich in oxygen, and

free from the putrid exhalations, can be obtained. These opportunities, perhaps, inure only to the better classes; yet the free and public parks are closed to none. Even the street air is far preferable to the poisoned atmosphere of the foul and stinking lodging-room. I have often thought that carrying the child through the streets, washed and dressed for exhibition, to the dispensary-building, worked no inconsiderable curative influence, and have fancied that the cleanly and better dressed were more amenable to medication. To express in a few words both the method of prevention and surest plan of cure, remove the child from the city, away from the immediate and accessary influences; maintain and restore nutrition; supply proper food.

Quite sure am I that at that stage of the inflammatory process where the general exhaustion and the asthenic type of the morbid process can be arrested or staid, there will begin the process of restoration. The type is adynamic; and the course and duration depend more upon the intensity of the type, and its consequent exhaustion and waste, than upon the extent or locality of the intestinal lesions. Some die during the early stage, when the lesions are only microscopical; others during the stage of hypersecretion and increased peristaltic action; others when the inflammation is sharply defined; and others perish subsequent to extensive ulceration and sloughing; but only a few cases terminate fatally, except from intercurrent complications, during the sthenic vigor of the morbid process, and these few are victims to that wearing-out exhaustion induced by positive suffering. Vitality is worn out by the persistent intensity of the symptoms.

Gastro-intestinal irritability, as manifested by nausea and vomiting, lientery, and augmented peristaltic action, constitute the essential phenomena of the morbid condition. In this connection I cannot too strongly urge the importance of securing and maintaining the rest and quiet of the alimentary tract. The symptomatic manifestations of this abnormal irritability are mainly the obstacles to digestion and nutrition. To pour food into, to fill to repletion a stomach which refuses to retain it, or which forces it through the pyloric orifice before it has undergone the preliminary process of digestion, is simply to provoke the extension of the abnormal irritability along the entire line of the mucous tract, and to invite other and more serious disturbances. Usually the gastric irritability is the precedent condition, having its origin in the abnormal irritation of nutriment. The increased and augmented peristaltic action is due, at least in the beginning, to the ex-

tension from the stomach of the excessive irritability to the muscular coat of the intestinal walls and to the irritation of the mucous surface set up by the wholly or partially undigested food, hastened through the gastro-duodenal orifice. This excessive muscular contraction is the primary pathological condition of the intestines.

The normal structure of the mucous membrane of the alimentary canal favors the occurrence and continuance of hyperæmia, and its delicate and penetrable epithelial stratum favors the access of irritants to the irritable elements of the membrane. Its structure opposes no barrier to the distension of its congested capillaries, and the natural softness of its parenchyma permits an almost unlimited dilatation. "The relation," says Rindfleisch, "in which the contractions of the intestinal muscular coat stand to the distribution of blood in the covering mucous membrane, appears to be of peculiar interest. As is known, the trunks of the arteries and veins, which supply the blood to the vascular nets of the gastric and intestinal membrane, pass through the muscular coat in an oblique direction. They are there surrounded by a sheath of loose connective tissue, which is tolerably strong in the arteries, so that there remains a wide space between the vessel and muscular bundles; in the veins, on the contrary, very insignificant, so that the lumina of the veins are easily compressed by a contraction of the muscular coat. In consequence of this arrangement, with every contraction of the intestinal muscular coat, an obstacle occurs to the return of the blood from the intestinal mucous membrane; there takes place an increased congestion of blood, which continues as long as the contraction lasts, and may assume a more permanent character by the more frequent repetition of the contractions." Hence the great significance of augmented peristalsis. Apart from the locomotion of the contents, it materially affects secretion, by means of the hyperæmia maintained. This mechanism, so essential to the due performance of the normal functions of secretion and resorption, upon the slightest disturbance becomes converted into a serious calamity. The physiological becomes transformed into a pathological hyperæmia. The normal and transient retention of blood becomes a passive and permanent congestion, to be augmented and extended by every recurring contraction. "At no mucous membrane," continues the author, "does the catarrhal disturbance of the circulation attain so high a grade as just at the gastro-intestinal mucous membrane, because the path-

ological irritant which affects the mucous membrane awakens the peristaltic action just as promptly, and in yet stronger measure than the physiological irritation by ingesta. Dysentery and cholera present us with examples on the largest scale of the injurious effects of this mechanism; the enormous œdema of the mucous membrane of the large intestine, the hemorrhages, secondarily, diphtheritic disturbance in the former, also develop under the influence of very severe tonic contractions of the muscular coat; and if we accept that in cholera also an enormously increased peristalsis contributes its share to the immense transudation on the part of the gastro-intestinal mucous membrane, we have established only a causal connection between two known phenomena of this disease. Meanwhile we need not turn to dysentery and cholera; what occurs there upon a large scale is repeated upon a lesser in the slightest catarrhs." Accepting these views as the correct interpretation of the phenomena, the suggestion heretofore presented, that the symptoms represent effects and causes, becomes of paramount importance in the adaptation of medicines to the cure of the disease. The gastric irritability, set up by the abnormal irritation of nutriment, is transmitted to the muscular tunic of the intestines; at the same time the undigested material, forced through the pylorus, acting as a local irritant to the delicate epithelial surface, increases the intestinal irritability—hence acceleration of the locomotion of the contents—augmented and more frequent tonic contractions of the muscular coat, and, by virtue of the anatomical arrangement, hyperæmia is established. Hypersecretion and altered secretion follow as the necessary result of the continuance of this pathological hyperæmia, and, subsequently, tissue-changes ensue.

The first indication to be met with medicines is to allay the gastro-intestinal irritability and to quiet the peristaltic contractions. As a sedative, in this condition, I have found no agent comparable to the subnitrate of bismuth. To a child one year old it should not be given in less than five grain doses, repeated every two or three hours, as occasion may demand. Usually I associate it with the tinctura opii camphorata or with the tinctura hyoscyami, the former being preferable. I believe that the subnitrate is a direct sedative to the irritated mucous surface, and, in the language of another, that it "stimulates, strengthens, and regulates the appetite, confining the bowels, rendering the stools black and depriving them of their fœtor; and, further, that it produces no general symptoms

whatever." It may also subserve the purpose of forming a protecting covering to the irritated surface. Harmless in the absence of any effect upon the general system, it should be given in sufficient quantity, at short intervals, to secure its local sedative influence. But to relieve the spasm, to quiet the peristaltic contraction, no remedy is so certain as opium. With children I prefer the camphorated tincture, because of the minute divisibility of the opium. But to dally with one, two, or three drop doses every two or three hours to a child a year old is simply a waste of time. Watching carefully, to avoid its narcotic influence, it should be given in doses, regulated according to the age of the child, sufficient to produce marked effect upon the frequency of the stools. The greater the flux and the more frequent the contractions the more urgent is the demand for its use.* The danger of producing cerebral disturbance, or rather brain-complication, is not more imminent from its proper and judicious employment than consequent upon the exhaustion from an excessive and protracted flux. When nausea and vomiting exist, as is usual in the outset, the aromatic spirits of ammonia has proven a most valuable addition to the bismuth-mixture. It is a stomachic stimulant, slightly excitant to the nervous system and antacid, hence admirably adapted to the debilitated state of the stomach. With these conditions, frequently from the very beginning, is associated acidity. This is not always due to the character of the ingesta, but occasionally, and perhaps, frequently, to an ascescent diathesis. Acid seems to be excreted in great excess by the stomach, and the intestinal secretions undergo the acetous fermentation. Acidity intensifies the abnormal irritability, precipitates the peristaltic contractions, and hastens tissue-change.

As a simple antacid the ordinary prepared chalk is preferable to any other medicinal agent. If the acidity is provoked by the nutriment, it should be suspended or rendered alkaline by the addition of lime-water or by a solution of carbonate of soda. The former is preferable when any considerable quantity is required, and can be very conveniently administered in milk, thus subserving a twofold purpose, correcting the acidity and favoring the retention of nutriment. Milk, as obtained in the cities, even though it may be fresh from a stall-fed cow, should never be given without the addition of an

* Besides the anodyne, opium and its alkaloids possess anexosmotic properties—that is, the power of "preventing the flow of liquid through the intestinal walls into the canal." Morphia possesses this anexosmotic property in the highest degree and narcein next. (American Journal of Medical Science, vol. lxv, page 242.)

alkali, for it is never free from an excess of acid. For this purpose I prefer the carbonate of soda. Whatever nutriment may be given should be given in small quantities and repeated at shorter or longer intervals according to the circumstances of the case. Fullness to repletion provokes nausea, vomiting, lientery, and flux. Rest to the stomach will frequently accomplish all that is desired, and abstinence from food, even for a day, may, in a large majority of cases, in the beginning, be practiced, not only without detriment, but with the most salutary result. In fact, so long as the stomach rejects all nutriment, digestion is suspended, and the impropriety of persistently tempting the child with nutriment to be immediately thrown up is so glaring and so manifestly injurious that it seems unnecessary to dilate further upon it. Occasionally the thirst is so intense that it is impossible to resist the demand for fluid. This generally is more apparent than real. The child is not able to appreciate the difference between dryness of the mouth and fauces, and the demand of the system for fluid. Unless there have been copious and exhausting serous stools, the thirst is usually simply the dryness of the mouth and fauces, and may generally be mitigated by the judicious use of very small quantities of finely-cracked ice frequently placed in the mouth. Pure water should never be given. If it does not aggravate the gastric irritability, it will surely provoke a stool. If fluid cannot be dispensed with and is not allowed in sufficient quantity in the nutriment taken, thin barley or rice-water or gum-water may be allowed. But the *eau albumineuse*, so highly extolled by Trousseau, made by diluting the white of four eggs with a litre of water, sweetened to taste by the addition of sugar and aromatized with orange-flower water, is by far the most valuable form of giving liquid to slake thirst. It supplies, in a moderate degree, nutriment, and in some cases proves an efficient adjuvant in allaying gastric irritability.

Medicines should be given to children in the liquid form, and the physician should order his mixture or solution precisely as he wishes it given. No preparation should be left to the nurses, for they will exercise their judgment and indulge their whims and caprices. If powders are directed they will employ a vehicle suitable to their taste, or conformatory to the imagined wants of the patient, and disregard the most positive injunction. The mixture or solution should always be made agreeable to the little patient, inviting to the taste. It is a great thing to win the affection of the child with pleasant medicine, and avoids the fretting and struggling, so frequently positively in-

jurious. As a menstruum, I have found none so agreeable to children, and so valuable as a stomachic, as cinnamon-water. With the addition of sugar and gum arabic in sufficient quantities insoluble substances may be conveniently suspended, or rendered temporarily so by slight shaking of the bottle, so that the child will usually take it without trouble.

In cases where the treatment with bismuth, as above indicated, has failed, which is more especially adapted to recent cases, I have derived very decided benefit from the employment of the aromatic sulphuric acid, in combination with the officinal solution of the sulphate of morphia. Two to six drops of the acid, with an equal proportion of the solution of morphia, may be given at intervals of three or four hours to a child one year old. The effect of this treatment is sometimes immediately decisive, cases which had obstinately resisted yielding speedily and terminating in one or two days in complete recovery. The action of the morphia is easily understood; not so readily, however, the action of the acid. It may be through the power of constringing the mucous surface, but I am not entirely satisfied of this. Certainly I have never derived such immediate and decisive beneficial results from the use of any other astringent; indeed, in my hands all vegetable astringents have proved either entirely worthless or absolutely detrimental in infantile intestinal diseases. Kino, catechu, rhatany, and tannin have more often hastened death than saved life. In no single instance have I witnessed any good effects from the acetate of lead. Usually, when given to children, it has provoked excessive nausea and vomiting. I have sometimes arrested the frequency and copiousness of the stools with astringents, but the promise of relief was so brief, and the relapse so fierce, that the temporary suspension in no manner compensated for the subsequent aggravation. In diarrhœas dependent upon relaxation and attended with a copious serous transudation astringents may subserve a useful purpose, but when the flux is the manifest phenomenon of some grade of the catarrhal process, they appear to me to be not only inefficient but contra-indicated. The catarrhal transudations and excretory products contain albumen, with which all astringents containing tannin and many others are incompatible, so that when given in intestinal catarrhs they simply coagulate the albumen constituent of the contents of the bowels and exercise no influence directly upon the mucous surface. On the contrary, the coagulum may become a source of renewed irritation.

In the later stages of the disease, when there exist manifest evidences of tissue-changes, and loss of continuity, ulceration, and sloughing, recourse must be had to other remedies than those heretofore suggested. Nitrate of silver, sulphate of copper, and the Lig. ferri pernitrat. each have their advocates. In occasional cases I seen very marked good effects follow the use of the nitrate of silver; the other two I have very rarely employed, and my experience with them does not justify a repetition. When satisfied of the existence of ulceration, copaiba and turpentine hold out the surest hope of benefit. But in all such cases the sheet-anchor of hope is in supplying suitable and assimilable nutriment, in restoring waste and in supporting the waning powers of life. Raw beef and rigid hygienic regulations will restore many children to health whose lives seem past all hope.

The employment of tonics and stimulants demands very great care; yet I am convinced that danger is far more frequently incurred by the failure to use them than by their injudicious employment. Whenever exhaustion is marked and threatening, their employment seems imperatively demanded, and especially is this the case in the choleriform variety. The aromatic spirits of ammonia and pure brandy are the most available and efficient of the stimulants, the former being preferable where the exhaustion is temporary and slight and accompanied with nausea and acidity, the latter where there is tendency to collapse. As a tonic and stimulant Huxham's tincture of bark is very useful; it invigorates the appetite, promotes digestion, gives tone to the enfeebled stomach, and in those cases, which not unfrequently occur in this region where the poison of malaria complicates the catarrhal affection, it is specially serviceable. In such cases occasionally quinia is demanded.

In those cases of cholera infantum where the exhaustion is very great and fatal collapse is threatened, as indicated by coldness of the extremities, difficult and laborious breathing, great thirst, lividity of the lips, a feeble and rapid pulse, diminished secretion from the kidneys, great pallor, sunken and pinched features, and cold breath, it is important to produce re-action as soon as possible. The hot mustard-bath is, incomparably, the most efficient means to accomplish this purpose. It may be repeated several times during the day, to maintain a proper and equable temperature and to restore surface-circulation.

The treatment of the dysenteric form does not differ essentially from that of entero-colitis, except from the more constant presence and greater in-

tensity of tormina and tenesmus, opiates are more necessary and better borne. There is always danger of prolapsus ani where the straining is great and continuous, and though not in itself dangerous, it is an exceedingly troublesome complication. Opium-suppositories are preferable to enemata, being more easily retained by a properly-adjusted pad and bandage. Astringent injection are objectionable. To retain in an inflamed rectum a fluid injection, the mere presence of which excites contraction of the intestine, requires, to afford time for the action of whatever anodyne it may contain, considerable exercise of the will. This is impossible with children. Rest of the bowel and the recumbent posture are essential in the treatment of dysentery.

Whenever fever is present, a diaphoretic should be employed, the liquid acetate of ammonia is the least objectionable. In the dysenteric form, ipecacuana is often very efficacious.

In thus hastily sketching the treatment, I have intentionally avoided any general review of the subject, preferring to confine myself closely to the observations which the dispensary-practice has permitted.

Article III.

The value of certain drugs in the treatment of bronchitis.

In this discussion of the treatment of bronchitis, I have reference only to the catarrhal form. Catarrh, as defined by Niemeyer, "consists in engorgement of the blood-vessels of any mucous membrane, accompanied by abnormal secretion, swelling, succulence of its tissues, and a copious generation of young cells," and is marked by certain definite stages. As it occurs in children, attacking the mucous membrane of the air passages, it is usually the result of "taking cold," and, so far as the adaptation of remedies to the treatment is discussed here, reference is only had to such cases occurring in children. Cold impresses itself either directly, producing local irritation and disturbance of nutrition and circulation, or by some systemic derangement of which the local manifestation is only a part.

The several stages of the morbid manifestations are, first, dryness of the mucous membrane, secondly, a scanty tenacious secretion containing a few young cells, and a few detached mature ciliated epithelial cells, and, finally, an active development of young cells mixed with an abnormal and copious secretion. These young cells are pus-corpuscles, and identical with the white blood-corpuscles. The stage of dryness corresponds more directly with the

primary pathological condition of engorgement, manifested in an intense redness of the mucous membrane, either uniform or in patches. The succeeding stage, marked by the re-establishment of the secretory function—the mucus being thin, scanty, tenacious, and mixed with a few young and detached epithelial cells—denotes the preliminary structural changes, which in the third stage are more precisely expressed in thickening, softening of the diseased tissue, and the very copious cell-development. In a practical point of view, these stages and conditions are not so sharply defined. The order of succession is well established, though not uniformly divisible into determinate stages.

My purpose is simply to portray the course of the catarrhal process and to fasten attention to the relation subsisting between the successive stages of the morbid process and the secretory product, with the view to elucidate the inutility of the method of treatment by the employment of medicines designed to act through their selective affinity for the secretory glands of the mucous membrane of the air-passages, either to re-establish the secretion or to arrest or modify a secretion morbid and excessive.

The stage of dryness represents the condition of engorgement; the successive stages of augmented and altered secretion and active cell-formation represent the progress of the morbid process through its conditions of swelling, succulence, and friability. The irritation of the mucous membrane supervening upon the cause is immediately followed by fluxionary hyperæmia—*ubi irritatio, ibi affluxus*—and the subsequent lesions are the consequent conditions. If a patient is presented during the stage of dryness—engorgement, is it the part of science to seek relief through the action of medicines designed to promote progress through the successive stages? Ordinarily the terminal point in the course of catarrhal inflammation of the lining membrane of the air-passages is augmented secretion and cell generation. In this condition the case is usually presented for advice. Is the cure to be sought through agents designed to produce this precise condition? If so, it is nature's method, and will usually, under proper hygienic regulations, run its course to a successful termination.

To pursue this discussion intelligently, it is necessary to definitely determine what is meant by expectoration and the *modus operandi* of expectorants. Expectoration is a twofold act, expressed in the secretory function of the muciparous glands of the mucous membrane of the air-passages and

the expulsion of the product of this functional action. The medicinal agents may, for convenience and comprehensiveness, be classed as true and indirect expectorants. With the latter I have naught to do at present. True expectorants, as I propose to consider them, are medicines which, entering the general circulation by absorption, possess a special direction toward the mucous membrane of the bronchial tubes, a selective affinity for the muciparous glands of the pulmonary surface. The doctrines of selective secretion and of action by direct contact through the circulation seem well established. They are constituent factors of the eliminative action. A substance absorbed into the general circulation may be eliminated through an emunctory without possessing any selective direction toward it, but true eliminatives possess inherently the quality of selective secretion. The secretory apparatus of the bronchial mucous membrane and of the pulmonary air-cells are, to a certain extent, and especially so with regard to certain odorous and volatile substances, emunctories. But their emunctory function is so incomparably less than other glandular parts, and essentially so in reference to inodorous and fixed substances, that no one would seek to derive the specific and direct action of any medicinal agent through the mere probability of its elimination through the pulmonary surface. Hence the explanation of the special expectorant-property must be sought in the quality of selective secretion. The action is by direct contact, and the effect is the same, whether it reaches the secretory apparatus through its special affinity or through the emunctory function of the part. A medicine, being itself excreted through any particular gland, exercises the same influence as if it possessed a special tendency to that gland. It is its selective tendency which gives to it its determinate therapeutic value and regulates its application. Eliminatives enter the blood, pass out through certain glands, and in passing through the glands the normal secretion of the gland is augmented. The increased secretion results from the increased vascular supply, and this vascular fullness may be carried to such an extent, through the effect of the eliminative, that congestion may ensue and the normal secretion be temporarily suppressed. The condition of engorgement found in the primary stage of bronchial catarrh, resulting from the influence of cold, may be produced by medicines eliminated through the pulmonary surface or by medicines possessing the special tendency toward the secretory apparatus of the bronchial mucous membrane. This fact is so well

established that all writers on therapeutics caution against the employment of medicines possessing this selective affinity during the stage of simple engorgement. Congestion of the bronchial mucous membrane at first arrests, subsequently augments, the secretion; the product is composed of mucus, the normal secretion of the glands proper, and pus, the product of the inflammatory process. If the congestion had its origin in excessive stimulation of the normal function and persisted through continuation of the exciting cause, the same inflammatory changes would ensue. If contra-indicated in the primary stage, because of a special tendency toward the inflamed membrane, and useful in the subsequent stages of the same morbid process, when the consequent lesions are superadded to congestion, it must be by virtue of some other influence than the selective secretory action. "Hypersecretion," says Rindfleisch, (p. 333, Text-book of Pathological Histology,) "never exists without a simultaneous hyperæmia of the mucous membrane," and "this hyperæmia is the proximate cause of the hypersecretion," and is at the same time the remote cause of the other "disturbances, of tumefaction, hæmorrhage, pigmentation, hypertrophy, &c., which, taken together, first make out the anatomico-pathological picture of catarrh of the mucous membrane." "The hyperæmia may be either passive or active. In the first case, it precedes the catarrhal inflammation for a longer time and has the significance of a remote cause; in the second case, it is the immediate consequence of the pathological irritation." Thus it appears evident that expectorants, as eliminatives, are inadmissible in catarrhal inflammation. Hyperæmia being the anatomical foundation of catarrh, certainly eliminatives would augment rather than diminish the physical cause. Surely a cure cannot be sought through the action of agents which will produce the morbid condition—the immediate cause of hypersecretion, and, remotely, tumefaction and softening. The migration of white corpuscles cannot be thus arrested. If the purpose be to eliminate effete products from the blood, why not resort to cathartics, cholagogues, diaphoretics, or diuretics, far more efficient and energetic eliminative expedients? If the hypersecretion be symptomatic of augmented function, surely agents designed to promote functional activity are contra-indicated. The morbid process being inflammatory, it may be claimed that the emunctory function is antiphlogistic. The air-cells and mucous glands of the pulmonary surface are far less efficient as emunctories than the mucous glands of the ali-

mentary canal, or the kidneys, or the liver, or the skin; and hence sound judgment and philosophic reasoning dictate the promotion of elimination through one or more of these sources. Besides the direct antiphlogistic effect thus more efficiently induced, the necessary and consequent revulsive influence would materially favor the relief sought. Pulmonary elimination, as an antiphlogistic in inflammation of the mucous membrane of the air-passages, would not only prove an inefficient remedial resource, but would be contra-indicated, because of the tendency to increase and intensify the fluxionary hyperæmia. It is universally conceded that expectorants are harmful during the stage of pathological irritation, the immediately antecedent condition of active hyperæmia, because of the certainty of augmenting the vascular fullness. In this condition the indication is to remove the physical cause, hyperæmia, and to prevent the ulterior tissue-changes, swelling, softening, &c. The suppressed or diminished secretion is an effect—the sign, not the disease. Resolution being established the secretion is restored. To stimulate the secretory function is to increase the vascular supply, and consequently the active or passive congestion. Medicines having an especial direction toward the respiratory mucous membrane, and given to restore or promote the natural exhalation, to re-establish the secretory function, do not remove the capillary congestion, do not promote the contraction of the capillaries, and are consequently inadequate to the removal of the physical cause. The hyperæmia continuing, augmented and altered secretion and other evidences of the progress of the morbid process soon take place. This is the regular course of the diseased phenomena, when the unaided powers of nature and the withdrawal of the aggravating and exciting influences fail to terminate the process by resolution. Derivation, revulsion, counter-irritation, elimination through the more active emunctories, fulfill the pathological indications. True expectorants possessing, as most of them do, other medicinal properties, some combining diaphoretic, some diuretic, others general eliminating and relaxing qualities, and perhaps all being nauseants, and thus depressing to the heart's action, may, and certainly do, through these revulsive qualities, at least partially prove remedial. But this is not the result of any expectorant action, and in no manner justifies their employment with the view to obtain the alleged specific direction to and effect upon the mucous membrane of the pulmonary surface. Their selective and revulsive actions are antagonistic.

A vast majority of the cases of simple bronchial catarrh terminate favorably without internal medication. The disease in itself is not self-limiting, but, if the aggravating cause is withdrawn, the unaided powers of nature will frequently speedily terminate the morbid process. It is important to understand how this result is accomplished.* So long as the irritant, the inhalation of cold air perhaps, is re-applied day after day, there will be continued accessions to the pathological irritation and consequent augmentation of active hyperæmia and increased distention of the congested capillaries. The mucous membrane of the respiratory tract is richly supplied with elastic fibres. This elasticity is the only barrier to the capillary dilatation induced by the increased volume of blood, and the resisting power is more vigorous in proportion to the distention-force, until destroyed or greatly lessened by too continuous tension. The elasticity and the blood-pressure are counter-forces. So long as the first maintains the mastery nature will prove sufficient to accomplish the cure, and so soon as it regains the mastery, after having been lost, the process of cure will begin. Following the indications of nature, the treatment must begin with the withdrawal of the cause of the irritation, and, secondly, to lessen the blood-pressure. The first may be fulfilled by remaining in-doors, and the second frequently by hot pediluvia and warm draughts at bed-time. Hence, it is manifest that it is to the removal of the cause and to the maintenance and restoration of the elasticity of the mucous membrane, and not to the secretory function, that the remedial resources must be directed, at least in the primary stages.

Failing to arrest the disease, the definite changes of the inflammatory process succeed. Increased and altered secretion, mixed with young cells and detached epithelial cells, occur. Thickening and softening of tissue follow. A copious migration of white blood-corpuscles through the stroma of the capillary walls takes place. The suppurative process becomes established. The muscular tunic becomes relaxed. The bronchial tubes are more or less

* Inflammation of mucous membranes causes an abundant formation and shedding of epithelium and mucus-cells, which after a time present all the character of pus-globules; and the free discharge of these may terminate the inflammation. This is the common course of catarrhal inflammations. And further, where the inflammation is deeper, involving the sub-mucous tissues, and even the connective tissue and parenchyma, so long as the sarcophytes, proceeding from the blood-vessels and proliferating in the tissues, retain their vital properties of motion and migration, they may likewise escape to the surface and be thrown off; and thus the products of bronchitis and pneumonia may be cleared away by free mucous and purulent expectoration. (C. J. B. Williams, on "Pulmonary Consumption," p. 69.)

dilated and filled with the muco-purulent secretion. Inflammatory œdema adds its counter-pressure to the other phenomena. So long as the causal irritant is permitted to increase the pathological irritation, so long will accessions of active hyperæmia take place. The irritant cause being withdrawn, the second indication is to remove the pathological condition—the passive congestion. The counter-pressure is derived from two sources: the volume of blood stagnated in the capillaries and the œdema-fluid. If there be any medicines specifically adapted to the cure of this condition their action cannot be eliminative, nor can the cure be sought through the emunctory function of the pulmonary surface. Either process occasions a physiological hyperæmia, and consequent augmented functional activity. The inflammatory product, so abundantly poured into the lumina of the bronchial tubes, unlike the normal secretion, is tenacious, purulent, and irritating. Hence, it becomes important to facilitate its evacuation. It is held that certain medicines possess the medicinal property of liquefying the secretion. That the inflammatory product may be liquefied by agents brought into direct contact with it through inhalation seems hardly to admit of a doubt, but that there are agents, acting through the general circulation, possessing special tendency toward the bronchial secretory apparatus and capable of inducing an undue secretion of the fluid portion of secretion, is not so clearly established. It is very true that there are medicines which produce diuresis, diaphoresis, and catharsis, but the organs through which these serous exhalations take place are active emunctories, upon which the medicinal agent acts through its special eliminative tendency to a particular emunctory. "Medicines which increase secretion are themselves excreted." It is also an established law, with perhaps few exceptions, that substances contained in the blood, and intended to be excreted, pass out through particular organs. The kidneys are the natural emunctories of water, and between them and the skin there exists a compensatory relationship; the bowels eliminate certain effete products and the liver certain other matters. The therapeutic action of medicines in producing diuresis is simply an augmentation of the physiological function, and not a modification of the secretory process. The liquefaction of the morbidly excessive and tenacious secretion of bronchial catarrh, by medicines introduced through the general circulation, cannot be a process analogous to diuresis or diaphoresis, for these denote increased functional activity and increased vascular supply. The altered product denotes altered structure, and the indication is

to modify the morbid action and conditions. The liquefactive is more probably a pathological than a therapeutical process, and may, perhaps, find its explanation in an altered condition of the blood and in the expulsion of the œdema-fluid, which may be expelled from the infiltrated tissue by the restoration, to a greater or less extent, of the normal elasticity. In the latter case it is to the elastic tissue, and not to the glandular structure, and in the former to the condition of the blood, that the remedies should be addressed.

The pathological irritation is the immediate cause of the hyperæmia. Swelling is the second anatomical element of catarrhal inflammation, and is evidently derived from the increased vascular fullness, from succulence due to the saturation of the soft parenchyma and sub-mucous tissue with serum, and partly from the migrated colorless blood-corpuscles. Congestion is the foundation, the *point d'appui* of these tissue-disturbances. To produce resolution it is necessary to arrest the amœboid movement. The abnormal secretion is composed partly of the normal secretion, a few detached mature epithelial cells, and to a greater or less extent, according to the progress of the morbid process, of young cells. Rindfleisch says, "It is manifest, that if by our medical skill we could succeed in removing the cells which have wandered in an inflamed organ, this organ would return to the same condition in which it was before the inflammation;" provided the modification of connective tissue which may have ensued be deducted, which might likewise soon disappear. He suggests, in this condition, that one of two methods of resolution may be adopted—either to wander out the migrated colorless blood-corpuscles or to promote their resorption by favoring their fatty degeneration. The latter process is materially promoted by the co-existing succulence of the inflamed structure. So far as I know, and as suggested by the same distinguished pathologist, heat is the only agent that will cause "already exuded colorless blood-corpuscles to wander farther;" but this agent must be employed within proper limits or else the process of emigration will be renewed and intensified. Apart from these considerations the indication is to remove the hyperæmia. As I understand and have endeavored to explain the *modus operandi* of the medicines alleged to possess the peculiar expectorant qualities, they are inadequate to the fulfillment of these indications. The subsequent tissue-disturbances and morbid lesions are only the evidences of the further progress of the same morbid process, having their origin in the persistent continuance of the hyperæmia, which, perhaps, is augmented and extended by

repeated accessions, and aggravated by the consequent general debility and exhaustion and by the softening and relaxation of the parenchyma of the membrane. It therefore appears unnecessary to trace the histological relation of the hæmorrhage, pigmentation, hypertrophy, and other changes to the primary and essential condition—hyperæmia. In the treatment, it is the objective against which any method of cure must be directed, if the pathological indication is to be fulfilled.

True expectorants, if there be any which will transform the unhealthy into a healthy action, must act by direct application or by contact through the circulation. None others are true expectorants. As yet carbolic acid is the only agent which is believed to possess the property of arresting, by contact, the suppurative process. Stillé limits the adaptation of true expectorants to the cure of that condition of the bronchial mucous membrane "in which the secretion is excessive and morbid," and maintains that by their employment the secretion and diseased condition may be modified. Like most authors of repute he classifies them variously, adapting them to different conditions of the morbid process. Some are stimulating, others depressing; some augment functional activity, others diminish secretion. This subdivision, and classification according to their special and additional qualities, are essential to adapt them, as expectorants, to the cure of the differing conditions of catarrhal inflammation of the respiratory tract. The pathological lesions succeed one another in regular order. To explain the curative influence of a class of medicines supposed to possess a peculiar and specific direction toward the lining membrane of the respiratory tract, and to adapt them to the varying conditions and progressive stages of the same morbid process, it has become necessary to qualify their mode of action as stimulants or depressants. In this connection it is important to bear in mind that, according as they are stimulating or depressing, they hold other properties to a greater or less degree. The depressing quality is proportionate to the nauseating or emetic action. All nauseants are indirectly expectorant; that is, by their relaxing influence upon the system generally and depressing influence upon the heart's action, they afford relief to the local congestions. The stimulating quality increases proportionately to the lessened emetic and nauseating action. Tartar-emetic stands at the head of the depressants; ipecacuanha next in order; followed by squill and senega, as the mildest of the stimulating. The first two are active emetics; squill, and senega, suc-

cessively, mildly nauseating and gently stimulating expectorants. In view of these considerations, is it not probable that the expectorant effect is the result of other properties than their specific action, by contact, upon the muciparous glands? If eliminated through the pulmonary surface, thus augmenting the functional activity, their presence in the product should be susceptible of easy demonstration. Magendie and Orfila found in animals killed by tartar-emetic and ipecacuanha, traces of inflammation and congestion in the lungs. Headland and Pereira maintain that these two substances possess, in a higher degree than any others, the peculiar quality of true expectorants. I am not aware that any of the true expectorants, excepting tartar-emetic, have been detected in the pulmonary secretion. Headland thinks it probable their presence might be demonstrated, but is ignorant of any attempt to do so. Unlike Stillé, most authors seek to illustrate the expectorant action of medicines by their supposed analogous effects upon other mucous membranes. This, perhaps, in the absence of the evidence of their presence in the bronchial secretion, furnishes the strongest proof of such action, but the analogy is not complete. Facts should be eliminated from hypotheses. If any one or all of them produced definite and determinate effects upon the alimentary mucous membrane, always independent of their other properties, such effects might be accepted as the true representation of their therapeutic action. For instance, tartar-emetic, however introduced into the system, is in great part eliminated through the stomach, and even when injected into the veins of an animal, from whom the stomach had been removed and replaced by a bladder, vomiting was still excited by the contractions of the diaphragm and abdominal muscles. In all cases, whether introduced into the system by absorption or by injection into the veins, the post-mortem examination disclosed vascular injection of certain portions of the alimentary mucous membrane. Here is an illustration of definite action and effects. If the effect upon the bronchial mucous membrane is analogous, surely it is not adapted to the cure of catarrhal inflammation by virtue of its peculiar action upon and direction toward the alimentary mucous membrane. It is an active nauseant and emetic, hence expectorant, but to secure fully the latter effect its nauseating influence must be kept within its proper limits, for emesis does not favor its expectorant influence, which is secondary and resultant, and measured by the degree and duration of the nausea. Thus it is perceived that its alleged expectorant quality cannot be separated from

the other more definite and determinate influence, and is not analogous, either in its mode of action or local effects. But the effects of tartar-emetic upon the bronchial mucous membrane are not left to inference or to deduction from its analogous effects upon the alimentary mucous membrane. Besides the experiments of Magendie and Orfila, Dr. Richardson has deduced, from his experiments on animals, certain conclusions in regard to its effects and mode of action, which I quote, in part, as follows from Stillé: "All permeable tissues absorb, and its effects are specifically the same by whatever channel, including the blood, it may enter. After absorption it may be detected in the blood, the serum, the urine, and all the organs. It excites marked local effects in any membrane by which it is eliminated," and however introduced into the system it causes redness of the gastric mucous membrane and the symptoms which attend its direct application to this organ. The post-mortem phenomena are congestion and fluidity of the blood, with local inflammatory lesions in the membrane, through which it may be eliminated. These conclusions have been substantially corroborated by many eminent investigators. Recently, Nobiling (Schmidt's Jahrbuch, 1866) deduced from a series of experiments instituted to determine its effects upon the living organism, when given in small doses continued for a length of time, the following conclusions: "Tartarized antimony produces two distinct effects—one upon the heart, another upon the alimentary canal.' The influence of the alkali is exerted upon the heart, and is either relaxing or depressing. Whether caused by direct paralysis of the muscular texture of the heart or through action upon the cardiac ganglia, he failed to determine satisfactorily. "The influence of the antimony is upon the alimentary canal." The action of the chemical combination is the combined action of the alkali and antimony, no direct or independent effect being derived from the tartaric acid. Hence "it is an article altogether unadapted for use in typhoid fever, in pneumonia, bronchitis, and pleurisy. Its apparent beneficial effects are counterbalanced by its deleterious influences upon the alimentary canal." It is evident from these investigations that the explanation of its curative power over catarrhal inflammation of the lining membrane of the air-passages must be sought through its antiphlogistic action, as expressed in its nauseating quality, and in its influence upon the heart's action and plasticity of the blood, and through its revulsive action upon the alimentary canal and skin. It is eliminated principally through the stomach, kid-

neys, and liver; very moderately, and fortunately so, through the lung. Only adapted, by virtue of its antiphlogistic and nauseating action, to the primary stages, its marked local effects upon the eliminating surface contra-indicate its employment when such surfaces are inflamed.

Ipecacuanha is the next in order of the true expectorants, and is closely allied, in its nauseating and depressing qualities, to tartarized antimony, though not so active and certain an emetic. I am not aware that its presence has been recognized in the bronchial secretion, and hence its elimination through the pulmonary surface has not been positively demonstrated. Its expectorant quality must then be studied in connection with its physiological effects and therapeutic action upon the mucous membrane of other organs. It is singularly true that authors are not agreed as to its precise effect upon the muciparous glands, though generally it is claimed to possess a special direction to the mucous membrane and especially to that lining the respiratory tract. By some it is held to be applicable to cases of morbidly excessive secretion, by others to cases of scanty secretion. "The emollient and nauseating [emetic tartar and ipecacuanha] expectorants," (says Pereira,) "are adapted for the more acute forms of bronchial irritation and inflammation." It is a familiar fact that when applied to an abraded cutaneous surface it produces inflammation, and when applied, directly or by inhalation, in many persons, to any portion of the respiratory tract, it occasions all the signs and symptoms of catarrhal inflammation. Ringer says it "excites a catarrhal inflammation of the mucous membrane" whenever applied to it, and that its varying effect in different individuals is simply a difference in degree. Large doses have been known to produce in animals inflammation of the gastric, intestinal, and bronchial mucous membrane. Emetina introduced into a vein or injected hyperdermically will produce vomiting, an effect similar, perhaps, in its mode of action to that of tartar-emetic. When taken into the stomach, ipecacuanha, in quantities insufficient to produce vomiting, excites the muciparous glands of the gastro-intestinal tube to augmented secretion, and through absorption into the blood it is claimed to produce a similar effect upon the bronchial tube. It is nauseating, and some maintain that it is only during this action that the bronchial secretion is augmented, and that this is the effect of its relaxing influence, while others hold that its action upon the bronchial secretory apparatus is wholly independent of any other influence, as illustrated by the effect of minute quantities, in certain persons, upon the pul-

monary surface, in whom it requires much larger quantity to produce nausea or vomiting. This is undoubtedly true, but it only proves that in very small quantities applied directly to the bronchial mucous membrane it is a powerful irritant, and that thus applied it more quickly sets up the inflammatory process than when introduced into the system. Stillé, however, maintains that the sooner the nauseating effect is obtained the speedier and more certain the bronchial secretion is excited. Pécholier's experiments upon rabbits showed that the rate of the pulse, the temperature of the body, and muscular vigor depressed under its operation, and this, suggests Stillé, "would tend to explain the efficacy of ipecacuanha in bronchial affections by its general sedative operation upon the circulation and its specific power of reducing the quantity of blood in the lungs." Through its property of exciting the muciparous glands it is laxative and a valuable addition to cathartic medicines. Dr. C. D. Phillips (The Practitioner, November, 1869) extols the power it exerts "over all diseased mucous membranes in checking profuse mucous secretions, whether from the air-passages, the alimentary canal, or the genito-urinary apparatus," and considers it most useful "in spasmodic coughs attended with profuse mucous expectoration and vomiting." He claims that it is expectorant, anti-spasmodic, and anti-emetic. Especially adapted to whooping-cough, "where the vomiting is more troublesome than the whoop;" to nocturnal spasmodic asthma unaccompanied with organic disease of the heart or lungs; to dysenteria and diarrhœa, "where nausea, vomiting, and retching exist," and to the sickness of pregnancy. Ringer's views of the action and uses of ipecacuanha do not differ materially from Phillips's, but how far they are corroborated by the experience of the profession generally I do not know. If it is adapted to all the conditions and applicable to all the pathological phenomena for which it has been so highly extolled by the various authors and observers who have given to the profession their experience, surely little else is needed to complete the art of cure. Its marvelous power, when given in very large doses, to control and subdue the morbid phenomena of dysentery (so well attested by several careful observers) must be derived from properties altogether different from those it possesses and exerts to augment mucous secretion and produce catarrhal inflammation. Its efficacy in checking the nausea and vomiting of pregnancy, of diarrhœa and dysentery, of the vomiting of whooping-cough, when the whoop is not troublesome; its activity as a nauseant

and emetic when these effects are desired; its power to arrest profuse mucous secretion from the air-passages, alimentary canal, and genito-urinary apparatus, and equally efficient and certain office as a promoter of mucous secretion of the gastro-intestinal tube, when its laxative operation, and of the bronchial secretory apparatus when its expectorant quality, is desired, seem to impart to it the will to fulfill the purposes of the giver. I may have been unfortunate, but I have failed to derive these multiform advantages from its employment. If so admirably adapted to the cure of catarrhal or diphtheritic inflammation of the colon and rectum, why not equally efficacious in the treatment of similar affections of the respiratory tract? Can it be that in the gut it acts by direct contact, and in the other instance it acts through the blood? Who would think of dusting into inflamed fauces or blowing into an inflamed larynx powdered ipecacuanha? If applied to the conjunctiva it excites inflammation, to the nasal fossæ it excites increased secretion, to the bronchial tubes it produces the phenomena of catarrhal inflammation, to the gastro-intestinal mucous membrane increased functional activity; as a nauseant it depresses the heart's action and relaxes muscular tension; as a sudorific it determines to the skin. If Phillips's theory of its action is correct, and his and Ringer's suggestions be the practical teachings of their experience, its expectorant quality is subordinate to its anti-spasmodic influence. I cannot explain its utility in these essentially different morbid conditions, and shall not attempt to reduce its therapeutic action to any one definite *modus operandi*; but, accepting the facts separated from hypotheses and individual opinions, will study them solely in reference to its utility in the treatment of catarrhal inflammation of the mucous membrane of the respiratory tract. What are these facts? As a nauseant it is relaxing and sudorific, and thus revulsively antiphlogistic; as an anti-spasmodic it may exercise an important influence in governing the secretion of mucous membranes. The intimate relationship between the nervous system and the secreting activity of certain glands is established by many facts, but however the nervous influence may be developed, or through whatever channel it may operate, the power over the secretory function is through the power to dilate or contract the coats of the arterial capillaries. "The general conditions," says Marshall, "which influence the functions of secretion and excretion are the quantity of blood supplied to respective glands, the quality of that blood, the presence of external stimuli, acting directly or

indirectly on the nerves, and, perhaps, some governing influence of the nervous system generally." As yet the doubtful power of ipecacuanha over the capillary circulation exerted through the nervous system has not been definitely determined, but if it be permissible to infer its mode of action from its known effect in augmenting the secretion, when applied directly to mucous surfaces, it may be assumed that it dilates the arterial capillaries, thus fulfilling one of the general conditions by increasing the vascular supply.

As a local or external irritant it produces phenomena resembling catarrhal inflammation. Hence it may be concluded that its specific action on mucous surfaces is by virtue of its power to augment the supply of blood, to induce active hyperæmia. The functional action of the secretory apparatus of mucous membranes and the primary condition of catarrhal inflammation, except so far as they may differ in the nature of the causes, in the absence of pathological irritation, and activity and passiveness of the hyperæmia, are somewhat analogous processes. In the former case the stimuli are purely physiological, in the latter pathological; yet either may be induced by therapeutic agents. The normal function may be carried beyond the limits of a true physiological process, and become a pathological one. The one terminates in the precise condition where the other finds its beginning—engorgement. Whether the engorgement arises from excessive physiological stimulus or pathological irritation, the primary disturbance is one of nutrition. An uninterrupted transmission of arterial blood through a part, and not an excess of blood stagnated in a part, is essential to normal nutrition. The analogy subsists only so far as involves the fluxion of blood, and ceases where tissue-disturbance begins. The congestion, and not the irritant or irritation, is the pathological foundation of the subsequent tissue-disturbance and changes. During the early stages of engorgement the physiological action is suppressed; subsequently a morbidly excessive secretion is poured out.

In what respects does this inflammatory product differ from normal mucus? "Mucus," says Marshall, (Outlines of Physiology, p. 766,) "is the clear, or slightly turbid, colorless, viscid fluid found on mucous membranes. It is partly secreted by the epithelial cells of the compound racemose glands, but in part, also, by those of the surface of such membranes. It is a special secretion from the plasma of the blood, and differs from it chemically. * *

It contains desquamated epithelial cells, mucous corpuscles which closely resemble white blood-corpuscles, and pus-corpuscles, and also contains nucleated cells intermediate between true mucous cells and epithelial cells," and owes its viscidity to mucin. Flint says it contains a few leucocytes, which are produced upon the mucous surface with great facility, and are the result of irritation and not constant constituents of normal mucus. The morbid product, besides other constituents derived from the transformation of the histological elements of mucus, is, so far as regards its cellular constituents and the mucin, analogous to the physiological secretion. These elements it contains in great excess. But it is more than probable that the leucocytes found in normal mucus are not wandering, colorless blood-corpuscles. Flint says they are formed on the surface, and Rindfleisch maintains that pus-corpuscles are not exclusively migrated white blood-corpuscles. At page 111, (Text-Book of Pathological Histology,) he says: "The mass of pus is everywhere formed by the emigration of colorless blood-corpuscles out of the vessels; only that, first, the way which the wandering cells take is directed in one case toward a free surface, in the other toward a point situated in the parenchyma of connective tissue; and that, secondly, in the production of pus upon mucous and serous membranes, the participation of the epithelium in the production of pus cannot be excluded," and suggests the further probability that a formative irritation of the stable connective-tissue corpuscles may cause their breaking up and impart to them the amœboid movement. According to Flint the production of leucocytes on the surface of mucous membranes never takes place except as the result of irritation. The epithelial cells are exclusively the mucus-forming bodies, from which, as a physiological product, it is cast out; as found in catarrh, it is the product of their destruction. Mucin is a constituent of normal mucus, not derived from the blood, but formed of the elements of secretion. It exists in great abundance in the inflammatory product, and is especially copious in the product of bronchial catarrh produced by cold. This excessive formation of mucin cannot find its source in the ordinary physiological production of mucus, but must be a transformation resulting from an abnormal process. It, like pyin, which is the distinguishing characteristic constituent of purulent mucus, is an albuminoid body and a transformation produced by a morbid action. Its formation is a part of the structure-change which completes the picture of the catarrhal process. The product of catarrhal bronchial inflammation sometimes contains blood, and albumen, which is either derived from the extravasated

blood or escapes uncombined through the desquamated epithelium. "The changes," says Rindfleisch, (p. 338,) "which the secretion of the mucous membrane experiences by catarrhal inflammation, are so striking, and present points of support so important for clinical decision, that it has been here and there believed that we could define catarrhs immediately as anomalies of secretion. This is not correct, for the anomaly of secretion is not the essence, but the consequence, of the catarrhal inflammatory condition." But it would be completely erroneous, did we see in catarrh only an increase of the normal secretion. There is a difference between secretion and excretion; and this difference prevails here. The physiologically most important secretions of the mucous-membrane tract—the gastric and intestinal juices—are by no means secreted in greater quantity from the catarrhal than from the healthy mucous membrane; on the contrary, a decrease of this secretion is constantly to be expected as a functional disturbance accompanying catarrhal inflammation. It is already different with the physiologically less important mucus, which also covers the normal mucous membrane. We know mucous catarrhs in which mucus is furnished in increased amount. They occur, *par excellence*, at such places of the tract as are distinguished for their greater abundance of mucus-preparing glands, at the pharynx, the respiratory passages, the stomach and large intestines. Yet we know that the preparation of mucus does not exclusively belong to acinous glands, but that the mucus-metamorphosis is the same for the protoplasm of the epithelium of the mucous membrane that the bony metamorphosis is for the cells of the epidermis, and hence we do not wonder at finding mucous catarrhs and mucous admixtures to catarrhal secretions, also, from mucous membranes without glands, for example, at the urinary bladder."

"A somewhat more intense irritation than the simple mucous catarrh presupposes the increased secretion of cellular elements. We distinguish in this connection epithelial and purulent catarrhs according as the secreted cells are predominantly epithelial cells or pus-corpuscles. I say predominantly because, as a rule, we find both together. A purely epithelial catarrh is, for example, observed upon the mucous membrane of the tongue, where the so-called coating of the tongue is nothing else than a massy separation of pavement-epithelium, such as is characteristic for that point of the mucous-membrane tract. We have no grounds whatever to assume that epithelial cells produced in excess are formed according to any other

than the normal principle of development, and in this connection we may conceive the epithelial catarrh as a simple hyperplastic process. But what if we find pus-corpuscles in the catarrhal secretion, if we have to do with a purulent catarrh? It is a question whether the catarrhal pus-corpuscles are also to be regarded as emanations from sub-epithelial connective tissue. Against this formerly universally-received opinion, the circumstance especially testified that we could always demonstrate an epithelium, either by scraping the surface or by vertical section, upon mucous membranes which were completely in the condition of purulent catarrh, and that this epithelium presents not any or but unimportant deviations from normal relations. In fact, later investigations, in which I myself have participated after Remak and Buhl, have taught that the pus of mucous membranes can arise by endogenous formation of the superficial epithelial cells themselves. All the pus-corpuscles of the catarrhal secretion, nor all the pus-corpuscles in every catarrh, are not formed in this manner. Young cells possess spontaneous mobility and may migrate. Thus the cellular elements of the sub-epithelial germinal tissue may penetrate between the epithelial cells and thus come to be thrown off. Mucus and cells are productions of the mucous membrane; they represent the supplied nutritive material in increased amount after it has already been subjected to a certain alteration into secondary products."

Having thus traced the physiological and pathological processes, so far as they relate to the formation of the mucous secretion and of the product of catarrhal inflammation, and having brought out the points of resemblance between the functional and morbid action, and between the secretion of one and product of the other, the final inquiry arises: by virtue of what property or influence is ipecacuanha adapted to the cure of the diseased phenomena?

In view of the analogy established between the physiological and pathological processes and products, how can a remedy, which, by virtue of its specific action upon the tissue involved, supplies the needful stimulus to augmented functional activity, be adapted to the cure of the same process, morbidly augmented and intensified by the consequent and secondary tissue-disturbances? All observers and experimenters are agreed that this drug, whether applied directly or through absorption to the gastro-intestinal or bronchial mucous membrane, augments the normal secretion, intensifies

the physiological action. It cannot, then, subserve the purpose of arresting the pathological process which is so analogous. It is inadmissible during the stage of primary engorgement—active hyperæmia—because, from its known effects upon the mucous membrane, it may determine a more active fluxion to the already hyperæmic membrane. It then possesses no influence to contract the arterial capillaries and thus diminish the vascular supply, and cannot, consequently, be adapted to the stage of passive hyperæmia, when the capillaries are dilated and gorged with blood. It is not a pulmonary eliminative nor excreted through the pulmonary surface, and hence cannot exert any direct influence upon the mucus-producing bodies, nor restore epithelial cells to the desquamated basement-membrane, nor arrest the hyperplastic process so long as it augments the nutrient supply. It cannot dissolve the viscid and tenacious product, for that is only soluble in a free alkali. It cannot diffuse the mucus, for it swells by imbibition, and in small quantities will saturate comparatively large quantities of water. It cannot promote resorption, for, as such, mucus cannot pass from the tissues into the blood. Its resorption can only be accomplished through its fatty metamorphosis. It cannot arrest the surface production of leucocytes, for, as Flint asserts, irritation increases their production. It cannot wander out migrated colorless blood-corpuscles, for this is only accomplished through the combined agency of heat and moisture; and, if it possessed such a power, how would it be possible to limit its action to wandering out already migrated colorless blood-corpuscles, and not to intensify the migration? So long as the pathological condition favoring migration continues, great circumspection and care are requisite in the employment of agents to accomplish dispersion, because of the danger of producing a stronger concentration of these mobile cells. It thus becomes manifest that ipecacuanha, through its alleged expectorant quality, its specific tendency toward and effect upon the bronchial mucous membrane, is not adapted to the cure of the morbid conditions. That it may prove beneficial through its antiphlogistic and relaxing qualities, I do not deny. It may also, as shown by Pécholier's experiments, diminish the amount of blood in the pulmonary structures, and thus subserve a useful purpose in the treatment of bronchial catarrh.

It is hardly necessary for me to trace separately, in detail, the physiological action of squill and senega. Both are classified as stimulant expec-

torants, and probably, through their stimulant qualities, may prove beneficial in the later stages of catarrhal inflammation of the respiratory tract. Both are locally irritant and contain an acrid principle which is carried into the general circulation by absorption and into the emunctories through which they escape. Both in large doses produce analogous effects upon the gastro-intestinal mucous membrane, and each has been known to produce inflammation of the urinary passages, strangury, and bloody urine. Senega is eliminated principally through the skin and kidneys. According to Sunderlin it copiously augments the flow of urine. Bocker found it slightly diuretic. Scroff says it increases the bronchial secretion and adapts it to the cure of cases of excessive secretion. Squill is essentially a diuretic. Its nauseating, emetic, and expectorant qualities are secondary. It is, probably, chiefly eliminated through the kidneys, and, according to Wood, excites the capillaries and secretory apparatus.

Through whatever channel squill is introduced into the system the effects are the same. That it possesses some special and specific direction toward mucous membranes cannot be doubted, but the action is excretory rather than secretory, and hence eliminative rather than nutritive. Its effect is to augment the excretion of water, and consequently an active diuretic, and, when expending its force upon the gastro-intestinal mucous membrane, an energetic cathartic. Whatever effect it may exert upon the respiratory tract is through the same common quality of increasing the aqueous exhalation. In consideration of the fact that mucus is not soluble in water, nor diffusible, but, on the contrary, will saturate and retain comparatively a very large quantity of water, thus increasing in volume without losing viscidity, it does not seem desirable to augment the watery transudation through inflamed surfaces. It is true that fatty metamorphosis is greatly favored by an abundance of fluid in the inflammatory focus, thus promoting the resorption of the cellular elements and other exuded matters. If this be the explanation of its beneficial influence in bronchial catarrhs, it is by virtue of its general effect upon mucous membranes, and should be equally applicable to all catarrhal inflammations and to all stages of the catarrhal process, and surely would possess a wider range of usefulness in the catarrhs of the mucous surfaces toward which it more uniformly and directly expends its force. It is conceded to be inadmissible in acute bronchitis. As an expectorant, says Stillè, it is "useful in cases of bronchial inflammation of a mild

form, when the sputa are tenacious and scanty and the lungs are free from acute inflammation," and thus especially "serviceable in chronic bronchitis complicating emphysema, and in all forms of chronic and subacute catarrh." If contra-indicated in acute catarrh because of the danger of augmenting the vascular engorgement, either by stimulating the heart's action or by dilating the capillaries, how is it possible that it can be useful in mild forms of the same process or in any stage of the existence of the physical cause? Conceding its utility as a stimulant in the chronic forms, its specific action and direction toward the mucous surface are at once ignored.

In this connection it is relevant to refer to a property common to all of these expectorants, expressed in the possession of other qualities, definitely determined, through the operation of which their specific action upon the lining membrane of the respiratory tract may be diverted. That this diversion action may prove salutary cannot be denied, but it so markedly characterizes their physiological influence that it subordinates their alleged direct expectorant qualities. When once the diversion action is established it is impossible to obtain any specific and direct action upon the bronchial surface. The utility of this diversion action is lost sight of in the favorable result which is ascribed to the predetermined direct action, rather than to the resultant indirect influence; hence the common practice is to employ them in such minute quantities that, practically, no benefit is derived. Tartar-emetic, ipecacuanha, and squill will produce their characteristic effects, whether introduced into the system through absorption from the stomach or through any other channel; and, however introduced into the general circulation, their expectorant action is always associated with the manifest phenomena of some other quality, and is, usually, proportionate to the degree of nausea, but not to the activity and energy of emesis. It is not only impossible to separate the associated qualities, but equally so to predetermine any special direction toward the bronchial mucous membrane alone.

Stillè, perhaps rightly, limits the therapeutic application of true expectorants to conditions of the bronchial mucous membrane "in which the secretion is excessive and morbid." Then why are they not more generally efficacious in whooping-cough? It is a catarrh, distinguished from ordinary bronchial catarrh in the mode of its origin and in the spasmodic character of the cough. Notwithstanding its distinct nature, and apart from any consideration of the element of contagion, its manifest local lesions are identical

with those of catarrhal inflammation. The paroxysms of cough terminate with the forcible expulsion of the glutinous and tenacious sputa, and do not recur until provoked by accumulated secretion. The frequency and duration of the paroxysms of coughing depend upon the rapidity of the excretion and its tenacity; then how important to correct the morbid excretory process. As yet no one has found an agent among the expectorants which holds out the hope of any uniform beneficial action, either in modifying the diseased conditions or in diminishing the morbid secretion. Meigs and Pepper have occasionally, Phillips uniformly, and Ringer only in certain epidemics, found ipecacuanha useful, the first basing its utility upon its emetic and nauseating property and Phillips upon its anti-emetic and anti-spasmodic action. Singular antagonism of views! In the present state of medical science the medical mind, singularly forgetful of the much-vaunted power of expectorants to modify diseased action and morbid secretion, seeks to adapt remedies to the neurotic and not to the local phenomena. Undoubtedly deriving its origin from a specific contagion, yet it curiously appears most generally during the season of the year and with greater intensity in the localities where bronchial catarrh is most prevalent. The poison is eliminated through the pulmonary surface, and there are located the tissue-disturbances.

In the further advocacy of the view that the salutary influence derived from true expectorants, in the treatment of bronchial catarrhs, is not through any direct action upon the membrane, I may be pardoned for quoting the following passages from Stillé, (Therapeutics and Materia Medica, vol ii, p. 495:)

"True expectorants are those which appear to have an especial direction toward the bronchial mucous membrane alone or toward it in common with the mucous membranes of other organs. They are all stimulants, and the greater number of them contain a resinous element more or less modified by its association with other principles. With such qualities and such a tendency to the seat of bronchial inflammation, it is evident that, if they are administered during the active stage of such inflammation, they must almost of necessity aggravate it, by arresting that process of restoration of which the inflammatory symptoms are the signs. * * * As in chronic inflammation of other mucous membranes, the blood-vessels remain enlarged, the membrane itself becomes thicker than in health, and from its surface mucus is secreted

of various degrees of consistence and shades of color, more or less mixed with a serous liquid, and ultimately containing more or less pus. Under these circumstances, as in similar conditions of the mucous membrane of the eye, the nasal passages, the fauces, urethra and vagina, a stimulant treatment is found to be the most successful."

It is manifest that Professor Stillé is unwilling to accept, in its entirety, the doctrine of an especial direction toward the bronchial mucous membrane, and, in ascribing to them the quality of stimulants, he must refer to their local stimulation. For in forbidding their use during the active stage of the inflammation he surely does not refer to their relaxing powers, and general antiphlogistic influence exerted through the revulsive operations of diuresis, diaphoresis, catharsis, and their sedative effect upon the heart's action; and, again, in likening their salutary influence in controlling the morbid conditions characterizing the advanced stage of catarrhal inflammation of the respiratory tract to the beneficial effects of local stimulation of conjunctivitis, rhinitis, and vaginitis, he surely does not refer to a method of treatment by general stimulation or by medicines introduced into the general circulation, for who would commit the folly of attempting to cure catarrh of the conjunctiva, of the mucous membrane of the nasal passages, or of the vagina, by general stimulation induced by introducing tartar-emetic, squill, or ipecacuanha into the system. The simile is deceptive. The agents employed in these local catarrhs are not remedies possessing any special direction to the mucous membranes. They are useful through their local effects, through their power of modifying the diseased action by direct application, and, perhaps, with most of them, the benefit is derived through their power of constringing the local capillaries. None of the expectorants possess any such property, and no one would think of applying tartar-emetic, squill, or ipecacuanha to the surface of an inflamed conjunctiva, or vaginal or nasal mucous membrane, with the expectation of diminishing the caliber of the capillaries or of diminishing the fluxion or congestion of blood. If, as local stimulants, they are inadmissible during the stage of active inflammation, because of the tendency to augment the hyperæmia, surely, if useful during any subsequent stage of the inflammatory process, it must be by virtue of the same influence. If contra-indicated during the stage of active hyperæmia, because of their general stimulating properties, and beneficial during the stage of bronchial relaxation, thickening and softening of the mucous membrane, and copious cell-generation, it

must be by virtue of the same therapeutical operation. I have maintained that, locally, they were irritants, and thus, indirectly, they may accelerate the heart's action; and I deny to them any property of general stimulation, that is, any power of accelerating the heart's action or of increasing its force. It is impossible to concede any such influence to substances which, even in very minute quantities, however introduced into the system, are, in their general operation, depressing, relaxing, and sedative to the heart's action. I am not prepared to deny that, in certain stages of the catarrhal process, general arterial stimulation would prove serviceable in distending the capillaries with healthy nutrient blood, and, perhaps, by the *vis a tergo*, facilitate the removal of passive hyperæmia, and, secondarily, aid in restoring the normal elasticity of the capillary walls; but I have not much faith in the healthfulness of such an operation. I can just as readily understand how the local temperature may be elevated, and the emigration of the colorless blood-corpuscles be thereby intensified; and how, also, the active determination of blood to the already congested capillaries may extend the area of hyperæmia, and thus intensify the morbid process.

To certain other substances containing a volatile oil are ascribed, not, however, very definitely, expectorant qualities. These volatile and odorous principles are partly eliminated through the pulmonary surface, not by virtue of any special direction toward the lining membrane, but in accordance with the law regulating the interchange of gaseous substances separated by membranes. It takes place chiefly in the pulmonary air-cells, and, as a rule, is without manifest effect upon the tissue.

Copaiba and the turpentines are substances analogous in their modes of action. They are general stimulants, increasing the frequency of the pulse and elevating the temperature. They are eliminated through the lungs and skin, but more obviously through the kidneys. Their influence on the bronchial mucous membrane is comparatively feeble. "It is probable," says Wood, "that all their effects, both local and general, are dependent almost exclusively on their volatile oil, which enters the circulation, and escapes unchanged or modified, through various outlets, exciting the several tissues in its passage," and hence are adapted to conditions "marked by the want of general febrile excitement, and of active congestion in the part affected." Turpentine is a local irritant, and is believed by Wood to dilate the capillaries. No one can doubt the decided curative power exerted by these sub-

stances over certain conditions of the mucous membrane, especially of the gastro-intestinal tract; but they are conditions which pertain to the chronic tissue-changes, and to ulceration, and therefore their consideration is not directly germane to the question discussed in this paper. In this city copaiba is quite extensively employed in catarrhal croup, and is regarded by its advo cates with very great favor. Not having witnessed its beneficial effects in this disease, I am not prepared to commend its utility or to estimate its efficacy.

In discussing the adaptation of remedies, I have reference only to acute catarrh, as defined by the stages and tissue-disturbances previously described. I have regarded the stage of pathological irritation and active hyperæmia as the preliminary or primary condition, and have sought to confine acute catarrh to certain phenomena, rather than to limit it according to time. A bronchitis which may endure from early autumn to spring, without passing beyond the ordinary anatomical lesions, which, perhaps in a majority of cases, are reached in a week or fortnight, is no more a chronic bronchitis than the latter. Chronic catarrh is usually a more extensive inflammation than the acute, and may be said to begin at that stage of the inflammatory process where, as Rindfleisch says, "the mucous membrane passes over into the condition of hypertrophy." This hypertrophy is a production of the catarrh and a condition advanced beyond the phenomena constituting acute catarrh, hyperæmia, swelling, softening, and hypersecretion. It is a true hyperplasia, having its origin in the connective tissue, and may involve the epithelium and glandular structures. But I do not propose to enter upon any discussion of these tissue changes. I simply desire to define the limitations of the acute inflammation, to avoid confusion in the further discussion of the treatment.

I do not intend to enter into the minute details of the treatment. In the milder forms, before any important tissue disturbance has taken place, the withdrawal of the aggravating cause—the inhalation of cold air, and quieting the cough, which is always a source of irritation, will usually accomplish the cure. These may be supplemented with some revulsive action; usually diaphoresis is the preferable method. The cough is a symptom, but in its mode of operation it becomes a concurrent cause, and I cannot too strenuously urge the importance of promptly allaying it, especially during the early stage, prior to the disturbances manifested in an excessive and morbid secretion. With me hyoscyamus and hydrochlorate of

morphia have proven the most valuable agents to mitigate or control the cough.

Niemeyer distinctly asserts that it matters not in what manner or with what agencies the diaphoresis is produced; that it is simply the revulsive, depletory, antiphlogistic action of the cutaneous transudation that is serviceable. I admit the value of diaphoresis, however effected, yet I maintain there is a choice of agents. This issue brings me directly to the consideration which I wish to present: the utility of ammoniacal preparations in the treatment of catarrhal inflammation of the respiratory tract. In this connection I refer exclusively to the liquid acetate, hydrochlorate, and carbonate of ammonia. They are all, to a greater or less extent, diaphoretic; all enter the blood by absorption, are eliminated through the general emunctories—skin, kidneys, and but very partially through the pulmonary surface. Locally they are irritants, and in passing out through any of the emunctories they stimulate the normal functional activity of the excretory apparatus. Neither of them possess any special direction to the pulmonary surface alone, and their peculiar and perhaps characteristic effects upon the mucous membrane are the result of direct application. Their utility in these affections depends not so much upon their antiphlogistic as upon their anticatarrhal virtue. Niemeyer thinks they "excite the action of the skin and modify the nutritive condition of the mucous membrane of the bronchi." Liquor ammoniæ acetatis has been justly regarded, since the time of Boœrhaave and Minderer, as an efficient and certain diaphoretic, combining also the qualities of sedative and refrigerant.* Voigtel found it a "mild and transient stimulant, with a special direction to the skin and kidneys." Richter claimed that it "augmented the secretion of the lungs and kidneys." Stillé commends its efficacy in "mild cases of catarrh, sore throat, and muscular rheumatism."† Vaidy found it serviceable in an "epidemic of pseudo-membranous broncho-pneumonia." Besides its efficiency as a sedative and refrigerant diaphoretic, it possesses other properties which enhance its value. Cloquet and Carrière, who employed it successfully in menorrhagia, held that it exerted some controlling power over the fluxionary movement. In common with the alkalies, though to a much less extent, it is antiplastic, resolvent, and liquefacient, contributing also, perhaps, to the solution

* Stillé, vol. ii, Therepeutics and Materia Medica.

† Ibid., p. 522.

of albuminoid exudations, mucus, and coagulable lymph, thus promoting their resorption, and probably exerts an inconsiderable influence in diminishing the plasticity of the blood. I must not, however, be understood as claiming for it any very decided influence in these respects. It is as a diaphoretic and sedative that it is chiefly useful, and especially adapted to the treatment of the stage of active hyperæmia. The additional qualities which I have indicated would extend its usefulness.

Ammonii Chloridum.—This salt is now very generally classed among the expectorants, and, as such, is held in high esteem by many physicians.* It certainly possesses no direction toward the mucous membrane of the respiratory tract alone, yet all experimenters unite in the general conclusion that it exercises certain marked influences upon the mucous surfaces. Gmelin declared that it would dissolve "viscid and stagnant humors," and prevent putrefaction, whether applied externally or internally. This opinion, remarks Stillé, corresponds closely with more recent results. Sunderlin ascribes its effects to its sedative influence upon the system and antiplastic operation upon the blood. Böcker demonstrated that it augmented the excretion of urea, and claimed that it quickened the "moulting," or waste of the mucous membrane. Stillé holds that it is only adapted to the treatment of catarrh after the stage of active inflammation has subsided, and even then should not be continued too long, because of the danger of promoting the destruction of the mucous membrane. It possesses, in an eminent degree, the general properties of the alkaline salts, and owes its efficacy chiefly to its antiplastic, resolvent, and liquefacient properties. It lessens the quantity of fibrin in the blood, dissolves albuminoid substances and mucus, and saponifies fatty substances. How far these qualities are available in the treatment of bronchial catarrh remains to be determined; the theoretical conclusions seem very plausible. Pereira refers with approbation to the suggestions of Gulliver, that the alkalies keep asunder the corpuscular elements of the blood, prevent the aggregation of the white corpuscles, and diminish their number and adhesiveness. Be the explanation whatever it may, the practical fact cannot be controverted, that it will in many cases resolve

* Dr. H. C. Wood says: "In obstinate acute bronchitis, after the first intense stage; in catarrhal pneumonia, both of children and adults; in bronchorrhœa, and also in ordinary chronic bronchitis, he has obtained more apparent good from the use of muriate of ammonia than any other remedy."—New Remedies, April, 1872.

the inflammatory process and dissolve the morbid excretion with amazing rapidity. The difficulty with me has been to determine the exact condition, or rather stage, of the catarrhal inflammation to which it is applicable. In the stage of active hyperæmia, marked by dryness of the mucous surface, active and energetic derivative action through the skin will, usually, promptly relieve the capillary engorgement. In this condition the liquid acetate is preferable to the muriate, because of its more decided diaphoretic quality. After the abatement of the active hyperæmia, as marked by the re-establishment of the secretion, though abnormally liquid and abundant, and containing young cells, the latter is peculiarly valuable. It hastens the process of resolution, mitigates the cough by its solvent power over the excretion, and perhaps favors resorption of the albuminoid exudation. In the later stages I have not found it as valuable as the carbonate. "Like most salts," says Sunderlin, "sal ammoniac operates on the alimentary canal as an excito-irritant. After its absorption it appears to reduce moderately the action of the heart and large arteries, and in this respect belongs to debilitating and temperant agents. But it acts as an excitant and irritant to the venous and arterial capillary systems; to the lymphatic vessels and glands; to the skin; to the kidneys, and especially to mucous membranes; not only increasing secretion, but also improving nutrition and assimilation, and counteracting organic abnormal conditions. It promotes not only mucous secretion, but also cutaneous exhalation. Its diuretic effects are less obvious."

The carbonate does not, perhaps, differ essentially from the hydrochlorate, except in its greater diffusibility and more decided general stimulating property. With some it has held high rank as an arterial stimulant. Stillé thinks its classification as a general stimulant is "very questionable," and maintains that its very transient stimulant operation is "speedily replaced by its grave and important alterations of the blood." Pereira says it is "antacid, stimulant, and sudorific, possessing also in a marked degree the qualities of a resolvent and liquefacient." The essential distinction between these two salts is to be found in the different conditions to which they are applicable. I have found the carbonate peculiarly adapted to the stage of excessive and morbidly tenacious secretion, attended with dyspnœa and evidences of general prostration. Neimeyer adapts it specially to the condition marked by dilated, relaxed, and paralyzed bronchi, accompanied with

profuse and tenacious secretion. In these conditions the effect is, frequently, marvelous.

There is nothing new in this adaptation of ammoniacal preparations to the cure of bronchial catarrh. The results which I have obtained have been obtained by many others. Nor is there anything original in the special applications of the different preparations to particular stages of the catarrhal process. I have but followed the suggestions of Niemeyer, and corroborated his conclusions. I have set up no explanation of the mode of action, but favor the opinion, so generally held by therapeutists, that it is through the qualities which belong to alkalies. Nor have I attempted to explain why they should be respectively applicable to special conditions ; I have simply, and briefly, attempted to indicate the results of my own experience.

I have not sought to discuss, *in extenso*, the treatment of catarrh, but endeavored to confine myself closely to the proposition set forth in the beginning. Many points of interest have been passed unnoticed, because they were not, necessarily, relevant to this discussion.

DEPARTMENT

OF

DISEASES OF THE EYE AND EAR.

D. WEBSTER PRENTISS, M. D.,

Attending Surgeon.

REPORT

OF

SECTION OF DISEASES OF EYE AND EAR

AT THE

COLUMBIA HOSPITAL DISPENSARY FROM SEPTEMBER 1, 1869, TO JULY 1, 1872.

D. WEBSTER PRENTISS, A. M., M. D., ATTENDING SURGEON.

SIR: In accordance with your request I have the honor herewith to submit the report of diseases of the eye and ear treated at this dispensary from September 1, 1869, to July 1, 1872.

During this time four hundred and eighty-three patients have applied at my service for relief, of which one hundred and ninety-six were for affections of the eye; thirty-eight effections of the ear, and the remaining two hundred and forty-nine, diseases of a different class, which were referred to their appropriate sections for treatment. Space does not admit of a detailed consideration of all the cases which have presented themselves, even were that desirable, and I have therefore selected from the report two of the more prominent diseases in a dispensary practice, namely, *Herpes of the cornea*, and *Trachoma*, for particular notice.

The diseases of the ear have been only one-fifth in number of those of the eye, and were met with principally in children. Only two cases were internal to the tympanic membrane; five were inflammation of this membrane, and the remainder were affections of the external meatus or external ear.

Case of rupture of both eyes.

The case in the table classified as "Rupture of both eyes," is worthy of notice from the peculiar manner in which the distressing injury was inflicted.

The victim was a respectable German woman, aged forty-two years, married, and the mother of a family.

She had been out nursing a sick friend, and was returning home on the night of August 26, 1871, between the hours of 11 and 12 o'clock at night; when in front of the hospital she was suddenly approached from behind by some person, who grasped her around the head with his hands—a finger of each hand coming over the corresponding eye. He then with a quick jerk, threw her on her back, but was frightened off by her screams for help. Her last recollection of sight was seeing a black face for an instant, and then everything became dark, though she did not lose consciousness. When seen in the hospital the following day she was totally blind, and an examination of the eyes showed them to be ruptured at the inner corneal border at almost precisely the same point in both eyes.

The rupture was as clearly defined in its edges as though cut by a knife, and extended into the posterior chamber. The eye-balls were collapsed, and the poor woman was suffering great agony at the time.

There was no other appearance of injury whatever excepting that the upper eyelids were slightly ecchymosed and œdematous. The treatment consisted of anodynes to relieve pain and soothing applications. After two weeks the eye-balls shrivelled up, pain ceased, and the patient was discharged.

It is remarkable that the injury in this case should have been so symmetrical. It is evident that when the hands were passed around the forehead, that the brutal assailant pressed his fingers into the victim's eyes to prevent identification. The finger-nails must have come in direct contact with the eye-ball, for the wound was clean cut, and the skin of the eyelids not broken.

Tabular Report.

1	Herpes of the cornea	38	31	Tremor of eyelid	1
2	Keratitis punctata	2	32	Contusion of eyelid	1
3	Diffuse keratitis	3	33	Cataract	4
4	Suppurative keratitis	4	34	Myopia	2
5	Hernia of the cornea	2	35	Strabismus	1
6	Gunshot wound of cornea	1	36	Neuralgia in stump of optic nerve	1
7	Foreign bodies in cornea	2	37	Neuralgia of orbit	1
8	Pannus	3	38	Rupture of both eyes	1
9	Ulcer of cornea	9	39	Atrophy of eye-ball	1
10	Opacity of cornea	3			
11	Sloughing of cornea from old age	1			196
12	Staphyloma	1			
13	Ulcer of sclerotic	2		DISEASES OF EAR.	
14	Amaurosis	11	1	Accumulation of cerumen	7
15	Anæmia of retina	4	2	Acute inflammation of external meatus	13
16	Iritis	6	3	Chronic inflammation of external meatus	7
17	Catarrhal conjunctivitis	25	4	Abscess of external meatus	1
18	Contusion of conjunctiva	3	5	Inflammation of membrana tympani	5
19	Blenorrhœa	4	6	Chronic disease of labyrinth	1
20	Ophthalmia neonotorum	6	7	Closure of eustachian tube	1
21	Trachoma	23	8	Otalgia	3
22	Herpes of conjunctiva	2			
23	Pterygium	1			38
24	Blepharitis ciliaris	15		*Summary.*	
25	Hordeolum	2		Diseases of the eye	196
26	Symblepharon	1		Diseases of the ear	38
27	Trichiasis	2		All other diseases, referred to their appropriate sections	249
28	Entropion	1			
29	Phlegmonous inflammation of lachrymal sac	1			
30	Blenorrhœa of lachrymal duct	5			483

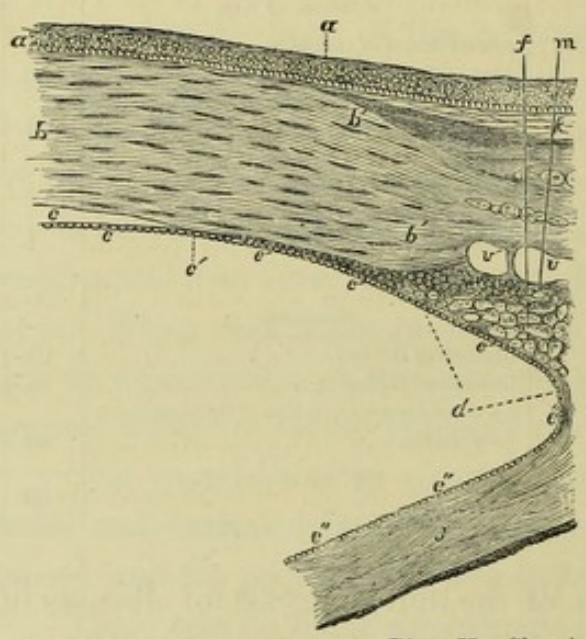
It will be seen by an examination of the foregoing list of diseases of the eye that affections of the conjuctiva and cornea have constituted by far the larger number of cases that have come under notice at the dispensary service, there being of the different forms of conjunctivitis sixty-four cases, and of inflammation of the cornea sixty-nine, making one hundred and thirty-three out of the whole number of one hundred and ninety-six. With the exception of trachoma, the diseases of the conjunctiva have been submissive to treatment, and easily removed, while those of the cornea have been of a much more serious character, both as to duration, intractability, and danger of permanent damage to the function of vision.

Of the affections of the cornea, a reference to the table shows that Herpes of the cornea has largely predominated, there being, out of sixty-nine cases of Keratitis, thirty-nine of this disease. The frequency of the occurrence of Herpes, and the evil results which so often follow, render it a matter of the utmost importance that it should be properly understood and properly treated. It is then manifestly appropriate that this disease and

trachoma, which bears a similar relation to conjuntivitis, should receive special notice.

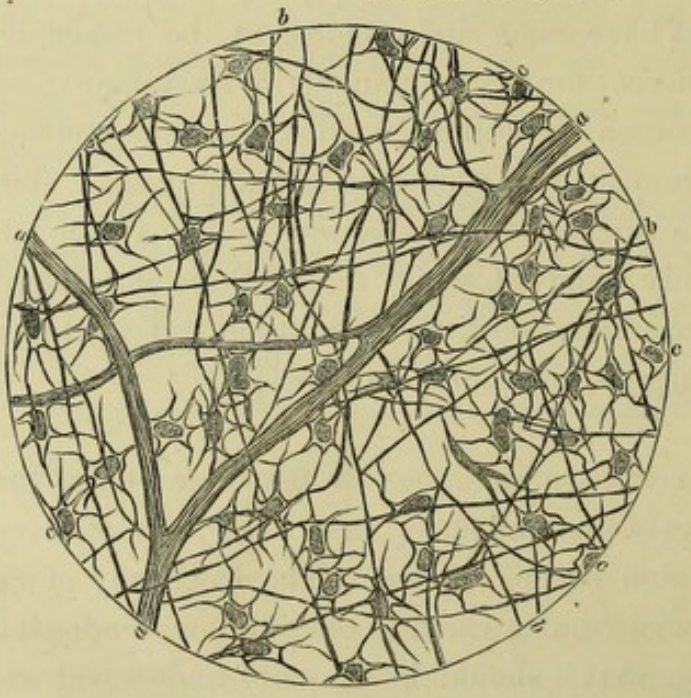
To a proper understanding of diseases of the cornea it is necessary that its structure should be understood. The cornea bears to the eye the relation of a watch crystal to the dial of the watch, perfectly transparent, not interfering with the passage of rays of light, but affording protection to the tender parts behind from injury.

Plate I.—Showing vertical section of cornea. (From Strickir.)



a a Epithelium.
b b' b' Corneal substance.
v v' Canal of Schlemm.
c c' Membrane of Descemet.
d Process of iris.
e Endothelium of mem. of Descemet.
e' e' e' Lig. pectinatum iridis.
e'' e'' e'' Lig. of iris.
f Network in space of fontana.
J Iris.

Plate II.—Showing nerves of cornea.



Section of frog's cornea prepared at Army Medical Museum, Washington, District of Columbia. Stained with chloride of gold.

a a a Large nerve trunks.
b b b Small nerve fibres.
c c c c Corneal corpuscles.

In structure it is composed of four layers, as follows, in order from the external surface inward:

1. The epithelium.
2. Membrane of Bowman.
3. Corneal substance.
4. Membrane of Descemet.

1. The *epithelium* is of the pavement variety, perfectly transparent, increasing in thickness toward the center. It is continuous with the epithelium of the conjunctiva, being transformed at the border of the cornea to conform to the special purpose it is designed to fill. This transformation can be traced with the microscope.

2. The *membrane of Bowman* is the floor of the epithelium, and lies between it and the corneal substance. It is a structureless, hyaloid membrane, not always present, and when present not always well defined, the posterior surface mingling insensibly with the corneal substance. It is a matter of doubt whether it has any claim to be considered a distinct membrane, appearing rather to consist of a thickening of the third layer at its anterior portion, such as is noticed in the connective tissue at other portions of the body. It is also called anterior limiting membrane, which expresses its relation to the other structures of the cornea.

3. The *corneal substance* makes up the bulk of the cornea. It is modified connective tissue, composed of delicate, perfectly transparent fibrillæ, arranged in layers and bundles held together by a transparent cement having the same refractive power. In the interspaces between these filiments are found the corneal corpuscles in analogy to the connective tissue corpuscles.

There are no blood-vessels in the cornea, these forming loops at its border. It is nourished in a matter somewhat similar to cartilage, the nutritious fluid finding its way between the layers of fibrillæ from corpuscle to corpuscle. The nerves of the cornea are situated in the corneal substance, being more numerous in its anterior surface. They are terminal branches of the ciliary trunks, and lose their medullary substance immediately upon entering the cornea, becoming transparent; they then divide and spread themselves into a network in its substance.

The existence of nerves in the cornea has been denied by an eminent microscopist, (Beale,) but they are shown in the beautiful preparations in the Army Medical Museum without the possibility of a doubt, even were the intense tenderness of the part alone not sufficient evidence. (See Figure II.)

4. The *membrane of Descemet* is the posterior limiting membrane of the cornea, separating the corneal substance from the aqueous humor. It also is a structureless, transparent membrane, having on its posterior surface a layer of polygonal epithelial cells. It is quite firm, easily separated from its attachment, and when so separated is so elastic that it rolls up anteriorly.

The structure of the cornea as a whole presents an example of the wonderful power of nature to accommodate the means to the end; it is a perfectly transparent body, yet composed of structures, epithelium, connective tissue, nerves, &c., found in all portions of the body, but here made transparent to meet the especial use for which it is intended.

A consideration of the anatomy forms a basis for the classification of diseases of the cornea, which is as follows: (After Stellwag von Carion:)

1. Vascular inflammation of the cornea:
   Characterized "by more or less irritation of the ciliary portion of the globe, a gray opacity of and development of vessels in the cornea."
2. Herpes of the cornea:
   Characterized "by circumscribed rounded points of inflammation about the size of a poppy-seed in the superficial layers of the cornea, and the presence of injection in the ciliary region around the eye-ball."
3. Inflammation of posterior layers of corneai, (keratitis punctata, Stellwag:)
   Characterized "by the appearance of groups of small, round, gray spots in the different layers, of regularly clouded gelatinous-looking corneal substance, and on the free surface of Descemet's membrane."
4. Diffuse inflammation of cornea:
   Characterized "by a moderate infiltration of the cornea with an opaque, grayish or yellowish white product, occurring with inflammatory symptoms, which shows little inclination to disintegrate, and usually collects in extensive, cloudy, distinctly bounded points."
5. Suppurative inflammation of the cornea:
   Characterized "by purulent collections in the cornea, which disintegrate and break down into fatty granular detritus."

This includes all the forms of distinct inflammations of the cornea, but there are other affections which result as effects of one or other of these diseases, such as opacities, ulcers, pannus, onyx, and the different forms of staphyloma, which call for special treatment.

Cases of herpes of the cornea.

Number of case.	Register number.	Date of admission.	Sex.	Age.	Color.	Nativity.	Date of discharge.	Result.	Remarks.
				Years.					
1	17	Dec. 10, 1869	F.	7	W.	Dist. of Columbia	Jan. 24, 1871	Cured	Cornea perforated; followed measles; scrofulous.
2	26	Jan. 18, 1870	M.	6	B.	do	Feb. 10, 1870	Cured of herpes.	Scrofulous; eczema and bronchitis; transferred.
3	41	Mar. 29, 1870	M.	16	W.	Virginia	Apr. 8, 1870	Cured	
4	43	Apr. 5, 1870	M.	16	W.	Dist. of Columbia	May 10, 1870	do	
5	55	May 17, 1870	F.	2	W.	do	May 17, 1870	(?)	Cornea perforated; seen but once.
6	61	June 10, 1870	F.	10	W.	Virginia	July 19, 1870	Cured	Phthisis; transferred to section on chest.
7	64	June 17, 1870	F.	7	W.	Dist. of Columbia	June 17, 1870	(?)	Seen but once.
8	50	June 21, 1870	F.	13	W.	New York		Cured of herpes.	Still under treatment for trachoma.
9	85	Sept. 20, 1870	M.	8	W.	Virginia	Sept. 23, 1870	Improved.	Came but twice.
10	93	Oct. 14, 1870	M.	64	W.	Ireland	Oct. 25, 1870	Cured	Single ulcer.
11	102	Dec. 13, 1870	F.	13	W.	do	Dec. 13, 1870	(?)	Seen but once.
12	108	Dec. 27, 1870	M.	17	W.	California	Jan. 31, 1871	Cured	
13	112	Jan. 6, 1871	F.	8	B.	Dist. of Columbia		Improved.	Eczema; scrofulous; still under treatment.
14	113	Jan. 13, 1871	F.	28	W.	Maryland	Jan. 31, 1871	(?)	Seen but once.
15	126	Mar. 3, 1871	M.	4	B.	Dist. of Columbia		Improved.	Twins; scrofulous; still under treatment.
16	129	Mar. 7, 1871	F.	4	B.	do		Improved.	
17	24	Jan. 24, 1871	F.	7	W.	do	Apr. 14, 1871	Cured	
18	44	Mar. 24, 1871	M.	17	W.	California	Apr. 21, 1871	do	Relapse from No. 12. Painter.
19	49	Apr. 11, 1871	M.	48	W.	Ireland	June 16, 1871	do	Secondary syphilis. Laborer.
20	51	Apr. 14, 1871	M.	2	W.	Dist. of Columbia	Apr. 14, 1871	(?)	Seen but once.
21	54	May 2, 1871	M.	7	B.	do	May 5, 1871	Improving.	Seen but twice.
22	61	May 12, 1871	M.	23	W.	do	May 30, 1871	Cured	Laborer; intensely scrofulous.
23	71	June 6, 1871	F.	9	B.	Maryland	June 6, 1871	(?)	Herpes of ten days' standing. Seen but once.
24	95	Aug. 4, 1871	M.	10	W.	Dist. of Columbia	Sept. 1, 1871	Cured	
25	100	Aug. 15, 1871	F.	2	W.	do	Sept. 5, 1871	do	Herpes of conjunctiva.
26	105	Aug. 22, 1871	M.	2	B.	do	Sept. 1, 1871	do	
27	109	Aug. 25, 1871	F.	7	B.	do	Aug. 29, 1871	(?)	Seen but twice.
28	131	Oct. 17, 1871	M.	5	B.	do	Feb. 27, 1871	Cured	
29	157	Dec. 12, 1871	F.	2	W.	do	Dec. 12, 1871	(?)	Relapse from No. 25. Seen but once
30	179	Jan. 23, 1872	F.	6	B.	do		Improving.	Still under treatment.
31	183	Jan. 26, 1872	F.	35	B.	Virginia	Jan. 30, 1872	Cured	Single papule.
32	193	Feb. 27, 1872	F.	5	B.	Dist. of Columbia			Still under treatment; scrofulous.
33	212	Apr. 16, 1872	M.	11	W.	do	Apr. 19, 1872	Cured	
34	228	June 7, 1872	F.	4½	W.	Maryland		Improved.	Still under treatment.
35	230	June 11, 1872	M.	12	W.	Ireland		do	Still under treatment.
36	232	June 11, 1872	F.	16	B.	Maryland	June 11, 1872	(?)	Seen but once.
37	235	June 21, 1872	M.	5	B.	Dist. of Columbia			Still under treatment; scrofulous.
38	236	June 21, 1872	F.	5	B.	do			Still under treatment; scrofulous.

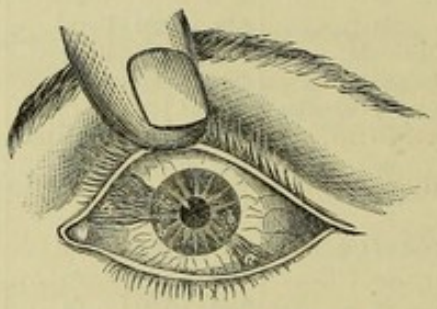
Article I.

HERPES OF THE CORNEA.

Under this name is classed the disease formerly called phlyctenular ophthalmia or strumous ophthalmia, which, however, are more general terms, including herpes of the conjunctiva in their meaning. It is called by Soelberg Wells *phlyctenular corneitis*. This is perhaps of all other diseases the one to which the eye is most subject. Lawrence and Mackenzie consider that it constitutes ninety per cent. of all the cases that present themselves to an ophthalmic service for treatment. The present report, however, does not sustain this statement, giving but twenty per cent. of the whole number.

When the disease is brought to the notice of the physician it has usually passed through the first stage of the eruption, which is that of the vesicle in analogy to the herpes of the skin. It happened only in two or three instances that the vesicular stage was seen, and then in cases where successive eruptions made their appearance during the course of treatment. The vesicle retains its vesicular character only for a short period, varying from twelve to thirty-six hours, when it is either ruptured by the pressure of the eyelids, or its fluid absorbed, leaving in each case a papule, which may be seen elevated above the surface of the cornea by looking across its surface.

Plate III.—Showing peculiar efflorescence of herpes.



a a Herpetic efflorescence.
b b Herpetic eruption on cornea.

In a small proportion of cases the papule was single, but more frequently there were from two to six or eight spots noticeable in one cornea, or two separate collections at different portions of the cornea. Around each spot, like a small halo, is found a cloudiness of the cornea, and when the papules are aggregated the cloudiness of one spot runs into another, so that a superficial opacity of considerable extent is created.

During the acute stage, congestion of the conjunctiva was present in all the cases, the congestion taking the form of an efflorescence, radiating in a

triangular form from the herpetic eruption to the circumference of the eye, and on that side nearest to the eruption.

This peculiar injection of the conjunctival vessels has sharply-defined borders and ends abruptly at the edge of the cornea for the patent reason that the latter has no blood-vessels. (See Plate III.) Sometimes, however, the triangle is completed by the development of vascular keratitis leading up to the herpetic papule. This occurred in one of the cases reported. Great intolerance of light, which is very generally a characteristic symptom of this disease, was not so prominent as we are led to suppose from a narration of the symptoms in the text-books.

In only two cases was it extreme, so as to prevent a proper inspection of the eyes. In these two cases there was severe conjunctival inflammation and profuse lachrymation, very greatly increased by the attempt to examine the eyes.

In a small proportion of the cases only did the photophobia occasion suffering, while in the larger number it could not be said to exist at all. This was probably due to the fact that most of the patients had passed the acute stage of eruption at the time of presenting themselves for treatment. Herpes of the cornea may be conveniently divided into two stages, for the purpose of study and treatment.

First. The *acute stage*, from the onset of the disease to the subsidence of the symptoms of acute inflammation, varying in length of time accordingly as treatment is applied early. The condition of the eruption corresponding to this stage is from the vesicular, through the papular, to the ulcer or opacity, as the result may be. In case 1 of the table the patient was under treatment over a year, going through eight or ten different eruptions of herpes during that time, and giving an opportunity of observing the invasion of the attack at the earliest intimation of its approach.

The symptoms corresponded to those above narrated; sharp pain in the eye, increased flow of tears, and marked intolerance of light ushering in the relapse. But by the next regular dispensary-day, (three days' interval,) under appropriate treatment, the acute symptoms would have nearly disappeared. The sight of the affected eye is impaired according to the situation of the eruption, with reference to the pupil, and the amount of the photophobia and hypersecretion of tears. The latter two symptoms occur in cases of foreign body imbedded in the cornea, an accident which fre-

quently happens to blacksmiths and stonecutters, and are due in both affections to the same cause, namely, irritation of those branches of the fifth nerve distributed to neighboring parts, just as in facial neuralgia a carious tooth is sometimes the starting-point of the disorder.

Second. The *second stage* is that of repair, or the removal of effects of the first. The eruption of *herpes corneæ* is situated upon the epithelial layer with the membrane of Bowman, or corneal substance for a base. As the acute stage subsides in the most favorable cases, the papules either dry up into small surface opacities or develop into excavated ulcers, the depth of the epithelium, but not extending into the substance of the cornea. These ulcers are converted into a simple opacities by being filled up with a white, fibrinous deposit, which is then gradually removed by absorption and the transparency of the cornea left unimpaired.

In cases less favorable the floor of the ulcer is not limited to the membrane of Bowman, but extends into the substance of the cornea more or less deeply, enlarging its borders on all sides until its progress is checked either by treatment or the efforts of nature. It heals slowly by a white opaque deposit from the bottom, and leaves a permanent opacity, which is injurious to the sight accordingly as its position is near the center of the cornea.

In the least favorable cases the ulcer continues its course of destruction until it reaches the membrane of Descemet, when, if this be not ruptured, hernia of the cornea is likely to occur by its protrusion from the pressure of the aqueous humor. When the membrane of Descemet ruptures, the ulcer has become perforating, and the aqueous humor escapes, drawing with it the adjacent iris. In two of the cases reported this occurred, and the iris became adherent to the inner surface of the opening—constituting anterior synechia—but was afterward disentangled by the persistent use of atropia.

A collection of pus, or puriform fluid, in the anterior chamber, (hypopion,) was noticed in cases 1 and 10, but *onyx* did not occur in any case.

The reason why we do not have onyx in this form of keratitis would seem to be that the borders of the ulcer limit the infiltration from extending between the laminæ of the corneal substance.

The graver results, such as complete pannus, staphyloma, complete anterior synechia, &c., are occasionally observed in the severest cases of Herpes occurring under unfavorable circumstances, and are to be treated as independent diseases.

Causes.—It is not an easy task to trace the cause of disease in dispensary practice, both on account of the uncertain intelligence of those who apply for its benefits, and because of a degree of unwillingness frequently to give correct answers. This difficulty is increased in cases of eye disease, for the reason that the lower classes almost invariably consider inflammation of the eye in any form "a cold," and either resort to domestic remedies or do nothing, thinking it will get well of itself in a few days. It is comparatively seldom, on this account, that Herpes of the cornea is seen in the vesicular stage, and when it is so seen, it is usually in relapses under treatment at the time of the relapse.

The names *scrofulous* and *strumous* ophthalmia would seem to indicate that the disease was essentially of a scrofulous character. Such an induction, however, is by no means correct, according to the cases enumerated in this report; for out of thirty-eight cases only eleven were in subjects considered to be scrofulous. The fact seems to be that the scrofulous diathesis bears to the disease the relation of predisposing cause, and the usual surroundings of poverty, ill ventilation, filth, and overcrowding act as exciting causes.

In three cases only was the cause actually determined. In case 1, where it followed measles; in case 8 it was due to trachoma, and in case 10 to injury. In case 19 the patient had secondary syphilis, but whether the latter had any connection with the Herpes I am unable to say.

The following table shows the proportion according to age, nationality, &c.:

AGE.						NATIONALITY.			COLOR.			SEASON.												
Under 10 years.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	Total.	American.	Irish.	Total.	White.	Black.	Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
24	9	2	1	2	38	34	4	38	23	15	38	5	1	4	4	3	9	0	4	1	2	0	5	38

Age is an important element in the causation of this affection—it being almost confined to the period of childhood. Out of the thirty-eight cases twenty-four are under the age of ten years, and nine of the remaining fourteen between that age and twenty years; so that of the whole number only five occurred after the age of twenty. As the time of life increases, so does the liability to herpes diminish. Nationality seems to exert no influence, though the value of statistics in this respect is greatly impaired by

the fact that most of the patients are children who, whatever the nationality of parents, are most likely to be born in this country. The nationality of parents was not taken. In regard to color, nearly two-thirds of the patients are white. As to season, although we would naturally expect the cold weather, when ventilation is most defective in the habitations of the poor, and their houses are oftentimes filled with smoke, and filth is especially liable to accumulate, would give rise to the greatest number of cases, still, June leads the van, furnishing nearly as many cases as the three winter months combined. It is, however, worthy of notice that the relapses have, as a rule, occurred during the cool or cold-weather months, probably for the reasons above mentioned.

The most discouraging element in the treatment of herpes of the cornea is the tendency to frequent relapses, or rather to frequent *new* crops of the eruption. This tendency is especially marked in the scrofulous cases.

In cases 1, 15, 16, 32, 37, and 38, we have an exemplification of this fact, they being under treatment the longest of any in the list—the latter five still attending the service.

The successive crops of the eruption followed each other at varying intervals, the interval being longer during the warm weather, and shorter during the cold.

The interval between the appearance of the relapses during the winter was three or four weeks.

Chronic granulation of the lids is an occasional cause, as in case 8. This acts mechanically by irritation from constantly rubbing over the surface of the cornea, in the motions of the lids, and is to be classed among the traumatic causes. The converse of this proposition is also true, Herpes of the cornea sometimes acting as a traumatic cause of trachoma.

Treatment.—The treatment of Herpes of the cornea deserves careful consideration, not because it is difficult or complicated, but because the use of improper remedies readily produces increased irritation and favors the development of those sequelæ which permanently injure vision. It is a matter of regret that even the most frequent of all eye diseases, viz, corneal Herpes and Trachoma, should receive so little consideration from the profession at large; for it is a fact developed in the history of all eye services, either dispensary or hospital, that a large proportion of these cases applying for treatment have been the subject of mismanagement at the hands of the gen-

eral practitioner. The sulphate of zinc collyrium, which is almost a panacea for all inflammations of the eye in general practice, is especially to be deprecated in the earlier phases of the disease now under consideration. The treatment of Herpes may very conveniently be divided, according to the division of the symptoms, into two stages: First, the treatment of the acute stage; and second, the treatment of the stage of repair.

First, of the acute stage.—Herpes of the cornea is essentially a disease of irritation, and may be compared in symptoms to those produced by the presence of a foreign body imbedded in the cornea, the herpetic papules taking the place of the foreign body. From this condition of irritation we draw the therapeutical indications in the first stage. The natural teaching, then, is to avoid the application of all irritating remedies, and to use only those which are found most efficacious in soothing and alleviating the pain and photophobia.

This end is accomplished most speedily by the use of instillations of sulphate of atropia, and the protective bandage. The strength of the solution of atropia usually employed is two grains to the ounce of water, applied from two to six times a day, according to the urgency of the case.

The action of the atropia is twofold, as a narcotic locally, numbing the sensibility of the parts, and by the dilatation of the pupil, thus relieving intraocular pressure. The protective bandage consists of a strip of white flannel two inches wide and seven inches long, cut *bias* to make it elastic, with tapes attached at each end long enough to pass around the head and tie over the forehead. After the atropia solution is dropped in the eye, a smooth pad of well-picked lint or soft raw cotton is applied over the closed eyelids, adjusted in such a manner as to make gentle, even pressure when the bandage is tied on over it. This treatment has not failed in a single instance to give marked relief, and where it is intelligently carried out abridges very materially the first stage, and lessens the probability of the formation of troublesome ulcers.

Cases may occur in which the inflammation is of sufficiently high a grade to call for local depletion by means of leeches, but such did not happen in the foregoing service, and when we remember that the disease is only too prone to occur in scrofulous and badly nourished children, the frequent propriety of even a small taking of blood will be more than doubtful.

In children of highly nervous temperament, leeching is absolutely contraindicated from increasing nervous irritability.

Treatment of the second stage.—The treatment which is required to promote the absorption and removal of the products of the acute stage is just the opposite of that required in the latter, and it is in consequence a matter of delicate discrimination to determine when we should suspend the one and resort to the other. After the herpetic papule has become an ulcer or opacity, for a variable period the cornea retains its irritable condition, and the application of irritant remedies may induce a second crop of herpes, or produce one of the other forms of keratitis. It is better, therefore, that we wait for a short period after the photophobia and congestion of the conjunctiva have subsided for the eye to regain something of its normal endurance, leaving it without treatment during the interval.

The most favorable result of herpes has been mentioned to be a surface opacity, or superficial ulcer. Either of these, in a favorable state of the constitution, may be safely trusted to nature, only guarding as much as possible against the original causes of the disease, and cautioning the patient to avoid strong light and over-use of the eye. But when the ulcer extends into the corneal substance, and is still extending, it is of the utmost importance to limit the progress as quickly as possible. If this extension of the ulcer is accompanied with symptoms of inflammation, conjunctival congestion, and dread of light, the irritating applications would not be allowable, but recourse must again be had to the atropia and pressure bandage.

If, however, the ulcer is more indolent in its character, the nature of the pathological condition going on in its walls is to be altered by the use of such remedies as may, from their irritating properties, change the nature of the inflammation and cause an exudation of fibrin.

The remedies best adapted to accomplish this end are sulphate of copper, calomel, or the ointment of the yellow oxide of mercury. The blue-stone is used in the form of pencil made by scraping or filing a crystal down to a small point and rubbing it smooth with a moist cloth. It is then to be very carefully applied to the ulcer in such a manner that no violence is used. This is to be repeated every second or third day. When calomel is employed, it should be reduced to a fine powder in a mortar, that ordinarily found in the shops being too coarse and gritty for application to the eye. It is applied with a camel's hair pencil, by dusting in with a short quick knock on the handle of the pencil.

The yellow oxide of mercury is to be preferred to the red oxide in

making ointment for the eye on account of its being in the form of an impalpable powder, while the red oxide consists of bright, shining crystals with very sharp edges and points, which cannot readily be gotten rid of by trituration. The yellow oxide is prepared by precipitating a solution of the bichloride of mercury with caustic potash; for the proportionate quantity of each, see *Parish pharmacy.* The strength of the ointment found to be most beneficial was one to two grains to the drachm, but sometimes an increased strength is called for.

It is to be applied night and morning over the inner surface of the lower lid, when the motions of the lid carry it on to the cornea.

Opacities left by ulcers of the cornea require the same treatment to promote their absorption as is given to the indolent ulcer itself, the yellow oxide ointment having the preference in selection.

When, however, the floor of the ulcer has become very thin, and perforation is imminent, quite a different plan of treatment is indicated. It is better under these circumstances not to wait for spontaneous perforation, but to forestall it by performing a paracentesis through the thinnest part of the floor with a fine needle and allow the aqueous humor to flow off slowly. The advantages of this proceeding are that it procures a small, smooth opening instead of a rough, jagged one, and diminishes the danger of anterior synechia by preventing a sudden evacuation of the aqueous humour. The pupil is to be dilated with atropia, or contracted with calabar bean, according to the position of the ulcer, the former if the ulcer is central, and the latter if it is on the periphery of the cornea. A pressure-bandage is now to be applied, and the case treated as acute ulcer.

In addition to the above treatment addressed to the local disorder, it is to be borne in mind that the scrofulous diathesis, and a depressed state of the system, is frequently an accompaniment, if not a cause of the herpes, and requires attention at the hands of the physician.

Cod-liver oil and sirup of the iodide of iron proved most beneficial in the dispensary service in improving the constitutional condition, and was necessary to the cure in the cases attended with frequent relapses.

The citrate of quinine and iron was given with good effect as a tonic, readily taken by children, where the appetite and digestion were impaired.

Article II.

Trachoma.

Cases of trachoma.

Number of case.	Register number.	Date of admission.	Color.	Sex.	Age.	Nativity.	Date of discharge.	Result.	Remarks.
					Years.				
1	4	Oct. 8, 1869	B.	F.	60	Dist. of Columbia	June 21, 1870	Improved.	
2	29	Feb. 8, 1870	W.	F.	50	Ireland	Apr. 22, 1870	Relieved.	
3	26	Jan. 18, 1870	B.	M.	6	Dist. of Columbia	Feb. 11, 1870	....do.....	Scrofulous; transferred on account of bronchitis.
4	37	Mar. 8, 1870	W.	F.	35	Ireland	Mar. 29, 1870	Improving	
5	38	Mar. 15, 1870	W.	F.	20	.....do.....	May 10, 1870	Relieved.	Etropion, pannus.
6	44	Apr. 8, 1870	W.	F.	12	Virginia	Apr. 8, 1870	(?)	Seen but once; Irish parentage.
7	50	Apr. 15, 1870	W.	F.	13	New York	Apr. 14, 1871	Improved.	Herpes & pannus; Irish parent'ge.
8	92	Oct. 14, 1870	W.	M.	18	Dist. of Columbia	May 16, 1871	Cured.....	Pannus of both eyes.
9	106	Dec. 20, 1870	W.	F.	30	Virginia	June 30, 1871	Relieved.	
10	20	Jan. 6, 1871	B.	M.	60	.....do.....	Feb. 24, 1871	....do.....	
11	26	Jan. 25, 1871	W.	F.	55	.....do.....	Jan. 27, 1871	(?)	Seen but twice.
12	27	Feb. 14, 1871	W.	F.	30	Ireland	June 20, 1871	Improved.	
13	42	Mar. 21, 1871	W.	M.	25	.....do.....	June 25, 1871	Cured.....	Miner.
14	56	May 9, 1871	W.	M.	50	.....do.....	June 19, 1871	Improved.	Waiter.
15	82	June 23, 1871	W.	F.	16	.....do.....	June 23, 1871	(?)	Pannus; seen but twice.
16	104	Aug. 16, 1871	W.	M.	13	.....do.....	.....	Improved.	Pannus. Still under treatment.
17	127	Oct. 3, 1871	B.	F.	20	Virginia	Nov. 3, 1871	Cured.....	Servant.
18	145	Nov. 3, 1871	W.	F.	33	Germany	Nov. 3, 1871	Improving.	Seen but twice.
19	160	Dec. 15, 1871	B.	F.	24	Virginia	Dec. 15, 1871	(?)	Seen but once.
20	161	Dec. 15, 1871	W.	F.	12	Dist. of Columbia	June 18, 1871	Obstinate.	Irish parentage; pannus.
21	194	Feb. 27, 1871	B.	F.	24	Maryland	Mar. 1, 1871	(?)	Seen but twice.
22	202	Mar. 26, 1871	B.	M.	73	Dist. of Columbia	Apr. 2, 1871	Improving.	Diffuse keratitis: seen but twice.
23	205	Mar. 29, 1871	W.	F.	21	Ireland	May 3, 1872	Improved.	Servant.

As in considering affections of the cornea we have found Herpes to be the most frequent and most important of the diseases met with, so we find, with diseases of the conjunctiva, Trachoma to be the most important though not the most frequent.

Catarrhal conjunctivitis is the most frequent, but from its more simple character is usually not a grave disease, being readily amenable to treatment or terminating in recovery without treatment.

The reverse, however, is true of chronic granular conjunctivitis, it seldom terminating in spontaneous cure, and proving obstinate under treatment, while its results, when not relieved, are among the worst to which the eye is liable.

The record shows sixty-four cases of conjunctival inflammations, of which twenty-three are of the affection under consideration, or more than one-third. We cannot suppose, however, that this represents the true proportion of cases in the whole number of conjunctival affections, because a large proportion of patients with milder catarrhal conjunctivitis do not present

themselves for treatment, rather resorting to domestic remedies, and in due time, finding themselves well.

Then, further, it is naturally the chronic cases which drift to an eye-service, after having tried other sources of treatment, or exhausted limited means in private treatment.

Trachoma is classified by Stellwag von Carion into four varieties:

1. Pure granular.
2. Capillary.
3. Mixed.
4. Diffuse.

First. *Pure granular Trachoma* is characterized by clear spawn-like granulations, resembling sago grains, situated principally on the reflection of the ocular conjunctiva to the tarsal, and most abundantly on the palpebral fold of the lower lid. They differ in number in different cases, in proportion to the severity of the disease, being in some instances only three or four, and at other times completely studding the mucous membrane. They are attended with more or less inflammation of a low-grade at their base, with serous effusion immediately beneath the conjunctiva, which gives them the appearance of resting upon a transparent, wax-like foundation. The disposition to serous effusion becomes more prominent in severe cases, and causes extensive œdema of the palpebral fold, so that upon eversion of the eyelid, it protrudes as a large tumor, completely filling up the ocular fissure, and showing on its surface abundance of the characteristic granulations.

From the vesicular appearance of these granules, it would seem that they might be evacuated by pricking, but such is not the case, although by the exercise of care they may sometimes be removed entire. They consist of a "stroma of connective tissue containing nucleated cells like lymph corpuscles, with a little fluid. They are surrounded by a delicate layer of condensed connective tissue, which has no proper enveloping membrane, but passes over into the neighboring less condensed tissue."—(*Wells.*)

They are situated just beneath the conjunctiva, projecting up into it, and are most abundant in the palpebral fold of the lower lid, though also found sparingly upon the ocular and tarsal reflections.

These follicles are microscopic in the normal condition, only becoming perceptible to the unaided eye in disease, and are analogous to the closed follicles of the alimentary mucous membrane.

The closed follicles of the small intestine may be taken as the type of

this structure, and are considered by eminent histologists to be physiological in their function, being the commencement of the lymphatic system. In this situation they are $\frac{1}{240}$ of an inch in diameter, and are distributed throughout the intestine in the proportion of one hundred to the square inch.

They contain within their stroma white blood corpuscles, and are similar in structure to lymphatic glands. According to Dr. Woodward, United States Army, these follicles are to be found in many of the mucous membranes. Their presence in the eye, therefore, is physiological, and their favorite situation locates the usual position of this form of Trachoma. The granular, or, as it is sometimes called, the vesicular, is the simplest form of Trachoma, and frequently bears to the other forms the relation of cause and effect. This fact has an important bearing in military practice as suggesting prophylactic measures against the development of chronic granulations, it having been observed in armies, as elsewhere, that vesicular granulations precede the severest forms of Trachoma in a majority of cases.

Timely treatment, therefore, of the former, with proper observance of hygienic conditions, may be expected to cut short the spread of an epidemic.

Second. *Papillary Trachoma.*—The papillæ of the conjunctiva are confined principally to the mucous lining of the upper lid, and are arranged in rows from its ciliary border to the beginning of the palpebral fold.

They are similar in structure to the papillæ of the skin, and vary in size from before backward, the largest being found on the palpebral border, being about one-tenth of a line in diameter.

This corresponds with the fact that the most exuberant granulations are usually found at this point in disease. The granulations are small and even, and regularly distributed over the extent of surface above described as papillary. When the inflammation is of a high grade, they become smooth and velvety and of a deep red color. The color varies with the grade of inflammation from bright red to dark purplish color, or pale flabby appearance, having a purplish hue in a low condition of system and sluggish circulation, and being pale in anemic individuals.

Third and fourth. *Mixed* and *Diffuse Trachoma.*—When granular and papillary Trachoma occur together it is called the *mixed*, and as this is almost always found to be the case when the patient applies for treatment, the mixed Trachoma is the form almost always observed in private or dispensary practice.

The pathological condition is the same as above described, with the addition of an increased amount of irritation and inflammation.

After this disease has continued for some time, the pathological process extends to the surrounding connective tissue, and proliferation of the connective tissue corpuscles gives rise to neoplastic growths along with the enlarged follicles and papillæ. This is *diffuse Trachoma.*

Mixed and diffuse trachoma are not, therefore, different forms of the disease, but only the higher grades in the development of the two previous forms.

The granulations of the lid change from their regular character to rough nodulated prominences, or are scored through with deep seams separating granulations with broad bases. As the disease advances cicatricial bands are formed, especially at the palpebral reflexion, sometimes destroying the fold, and uniting the upper border of the tarsal cartilage to the ocular conjunctiva, producing what is called *symblepharon posticus.* The tarsal cartilage also is implicated; it becomes softened and elongated, losing its elasticity, so that the lid droops, and when everted shows no tendency to return to its normal position.

The weight of lid is so increased that the levator palpebrarum muscle no longer has the power to elevate it, constituting one of the forms of *ptosis.*

Dryness of the eye (xerophthalmia) is produced by an obliteration of the tear-ducts from cicatricial contractions.

The evil results, however, are not confined to the lid and conjunctiva; the most serious of the complications are the affections of the cornea, produced mechanically by friction with the roughened surface of the lid. The most frequent of these are pannus, herpes of the cornea, and ulceration, while staphyloma follows as a remote result.

The *clinical history* of Trachoma varies with the form and degree of inflammation in each case.

The vesicles of the first variety sometimes exist without giving rise to any symptoms and without the knowledge of the patient.

This state of things, however, does not long continue; upon the supervention of some cause of irritation, the eyes become more sensitive; there is difficulty in using them in bright light or at night, and they soon become fatigued by close application.

Increased flow of tears is noticed, and the discharge, as the disease advances, becomes yellowish and mixed with pus and flocculi.

The ocular conjunctiva, in pure granular and papillary Trachoma, may not be at all affected, but in the mixed and diffuse forms it is almost always greatly injected, with the development of granules on its surface. The sight is affected according to the amount of photophobia, the increased flow of tears and discharge, and in the later stages by the sequelæ. Pain is not a prominent symptom in trachoma, being of a dull, aching character, rather than sharp or acute, the feeling being that of having sand in the eye, from the roughness of the granulations.

Causes.—We may take it as a starting-point in determining the cause of Trachoma, that it is a disease which may be produced in susceptible persons by any irritation of the conjunctiva that is severe or long continued. Lawrence recognizes this fact when he calls it "lunar-caustic" ophthalmia, considering the abuse of that chemical to be a fruitful cause.

In like manner Mackenzie states that chronic granulations are most frequently the result of *catarrhal* ophthalmia, the latter acting as a long-continued irritant to the follicles and papillæ. This also gives us an explanation of the relation between the simple granular and the severer forms of Trachoma, the former being regarded by some ophthalmologists as the cause of the latter, which, indeed, is the case, viewing the granular or vesicular variety in the light of keeping up a condition of irritation in the conjunctiva. Contagion also is an important element in the causation of this disease, as shown by its spreading from a focus among persons crowded together, as in ships, jails, hospitals, and armies, and also by the extension from one eye affected to its fellow, from the discharge being carried over the bridge of the nose.

It may, however, be questioned whether the matter of contagion, that is, the discharge, contains a specific virus, because by inoculation with other eyes it does not always produce Trachoma, but sometimes blenorrhœa or even diphtheritic conjunctivitis.

The following table gives the relation to age, nationality, &c., in the cases reported:

AGE.								NATIONALITY.					COLOR.			SEASON.											
Under 10 years.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	Over 60.	Total.	Irish.	Irish descent.	American.	German.	Total.	White.	Black.	Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1	6	7	3	1	4	1	23	9	3	10	1	23	16	7	23	3	3	5	2	1	1	....	1	.....	3	1	3	23

Between twenty and thirty years gives a greater number of cases than any other decennial, while from ten to forty years embrace three-fourths of the whole number; only one case occurred under the age of ten years. It is therefore more especially a disease of adult life, being less frequent both in childhood and old age. As to nationality, the Irish and those of Irish descent stand pre-eminent, covering more than half the entire number.

An inquiry into the mode of life of the lower class of Irish will perhaps furnish a clew to the cause of its prevalence among them. If we follow these people to their homes, we shall find among them an almost national predilection for living upon an equal footing with domestic animals, such as cows, pigs, goats, dogs, and geese, and giving them free *entrée* into their houses. The result of this is an accumulation of filth and a contamination of the atmosphere which no physician who has ever been unfortunate enough to spend the night with a midwifery case, amid such surroundings, will easily forget.

The disease is found prevalent not only among the Irish, but in all nationalities where a similar mode of life prevails, especially where domestic animals are domiciled with human beings. Indeed, according to Stromeyer, vesicular granulations are met with among some of the domestic animals, particularly pigs, which are kept in a notoriously filthy condition.

On this point Dr. Marston says, "So certain do I feel that the prevalence of vesicular disease of the lids is in direct ratio to the amount and degree of defective sanitary arrangements, that I conceive the palpebral conjunctiva offers a delicate test and evidence as to the hygienic conditions of a regiment."

As to color, the number of white persons affected were more than double the blacks. It might here be urged that the sanitary condition of the latter in their homes, both as regards crowding, ill-ventilation, and cleanliness, is quite as bad as with the lower class of Irish. This is quite true, but it is not characteristic of the negro to admit the lower animals to companionship, and the peculiar aroma of the negro hut is not usually due so much to extrinsic causes as to intrinsic emanations from the odoriferous glands. The fact of Trachoma being comparatively infrequent in the negro has a significant bearing with reference to the question of Trachoma being a scrofulous disease, the scrofulous diathesis being much more prevalent in the black than the white race.

As to season, the six coldest months have given eighteen cases against five cases for the remaining six months. It is true that the patients were affected with the chronic form of granulations, but as long as the disease remains quiescent, they are apt to consider themselves improving and do not resort to treatment. In this way we may conclude that there was an exacerbation brought on by the chilling winds out-doors, and the confined quarters in-doors that drove the patient to the dispensary for relief. A cause which will produce an exacerbation, it is fair to suppose, would promote the action of exciting causes *ab initio.* March gives the greatest number of cases of any one month, because, perhaps, of the high prevailing winds during that month.

Prognosis.—The prognosis in trachoma is difficult; it is a tedious disease to treat, difficult to cure, and still more difficult to prevent its recurrence.

The gravity of the prognosis as to interference with vision depends principally on the complications, and is of consequence greatest in the mixed and diffuse forms.

The prognosis is therefore least favorable in these latter forms, while it is more so in the papillary, and most favorable in the simple granular. In children recovery may take place spontaneously, but in adults we cannot flatter ourselves with any such hope.

The difficulty of getting this class of patients to continue returning for treatment until legitimately discharged is an obstacle in the way of estimating the length of time required for the cure of the disease. This also differs with the form of the disease, being longer or shorter according to the severity of the case.

The effect of one or two applications of the remedy is to make the surface of the eyelid smooth and relieve the feeling of grit in the eye which the granulations had caused, and remove the symptoms of irritation.

It is a peculiarity with trachoma patients that as soon as they feel themselves better, they imagine that they are well, and consider further treatment unnecessary.

We had in the dispensary service only mixed and diffuse cases, and of those who were faithful in attending the service the time varied from six months to one year and a half, and I have ventured to pronounce but three of these *cured;* that is to say, three in which there seemed little probability of the disease returning.

The remaining cases were relieved or improved.

This would not seem to be very encouraging as to the value of treatment, but it is to be remembered that there are diseases which, if not cured, must be palliated, to prevent consequent complications, or to relieve suffering.

This is particularly true of Trachoma, since it is the results rather than the disease itself which are to be dreaded, and the treatment is of the utmost benefit in relieving symptoms of irritation, and of the utmost importance in preventing the injurious sequelæ.

Treatment.—The treatment of Trachoma is different in the different forms and stages of the disease.

It may be laid down as a rule that no irritant or caustic applications are to be employed as long as symptoms of acute inflammation are present in the eye.

The inflammatory symptoms are characterized by intolerance of light and congestion of the ocular conjunctiva, and, whatever the form of disease, must be removed by appropriate treatment before the granulations can claim attention.

The treatment to be employed is the same as indicated for the first stage of *Herpes of cornea*, namely, instillations of sulphate of atropia solution and the protective bandage, and occasionally the cold compress, when there is much heat about the eye.

As in Herpes of the cornea, it is here also not an easy matter always to determine just the right period for the transition from the antiphlogistic to the irritant remedies, the conjunctiva frequently retaining a morbid sensitiveness after the acute symptoms have subsided, which is lighted up into inflammation by any unusual irritation. It is proper, therefore, to allow a short interval to elapse after the acute symptoms have subsided before applying remedies to the trachoma proper.

It is a matter of the highest importance in all the forms of the disease that exciting causes should be removed as far as possible, and the patient placed under the best hygienic conditions. This is of especial importance in armies, hospitals, and prisons. Each person should have clean water, clean towels, &c., and trachoma patients should be kept separate, and have good ventilation and a regular temperature.

These directions are easily carried out in the case of hospitals, &c., and in private practice among the better class; but I have found it almost impos-

sible to accomplish anything in the way of hygiene among the dispensary patients, who are so situated that cleanliness and good ventilation at home could only be secured by pecuniary sacrifice.

Tobacco smoke is a cause of irritation deserving special mention, as smoking is a universal habit among the lower class of Irish, and when doors and windows are closed in the cold weather their habitations are not endurable to one unaccustomed to the fumes of tobacco.

A proper observance of sanitary measures alone will probably suffice for the removal of the milder forms of simple granular trachoma, when resorted to in the earliest stage of its development, but when it has already continued for some time, something more is necessary to its cure, such as mild astringent collyria, sulphate of zinc or acetate of lead, two to four grains to the ounce of water, or borax, six grains to the ounce, dropped into the eyes three times a day. If the case should prove obstinate, the granulations should be lightly touched with the crystal of sulphate of copper, every third day, the collyrium being used during the interval. The vesicular appearance of the granulations tempts one to prick them open, but experience has shown this not only to accomplish no good, but to be injurious from increasing irritation.

In the second form of Trachoma, the papillary, the treatment is the same as above, with the exception that remedial measures are always necessary to the cure, and must be more decided in their action. The pencil of sulphate of copper is to be applied to the granular surface every second or third day, and the collyrium to be used as above.

As the simple granular and papillary Trachoma increases in severe cases, and the granulations become more developed, they merge into the mixed and diffuse forms, which, as before mentioned, are the forms usually met with in practice. These latter are essentially chronic in their character, but are liable to inflammatory exacerbations, to which the remarks on inflammatory symptoms are applicable.

As the evil results of Trachoma are due to the roughness of the lids from the prominence of the granulations, treatment is to be directed at once to their removal.

This may be accomplished either by knife, nitrate of silver, or sulphate of copper. The cases which require the use of the knife are those in which the granulations are very exuberant, with distinct or pedunculated bases.

The lid is to be everted and carefully steadied by an assistant, while the prominence is shaved off close to the mucous membrane with a knife, or cut off with scissors curved on the flat. The mucous membrane must not be injured, however, for fear of leaving cicatrices. After each prominence is thus removed separately, the surface is touched lightly with nitrate of silver, and the cure is to be completed by the frequent application of this agent or the sulphate of copper.

In the diffuse variety, there is a uniform hypertrophy of the surface of the lid, the granulations being exuberant and merging into each other. In this condition it is not practicable to use the knife, and the caustic is substituted. The lid is everted as before, and the surface touched freely with the nitrate of silver pencil over those parts where the development of diseased tissue is greatest, and lighter over the parts less diseased, washing off with a little warm salt water any of the remedy that may remain free. The same care is necessary with the caustic as with the knife, not to carry the destruction of tissue into the proper structure of the mucous membrane. Another methed is by rubbing down the surface with sulphate of copper until quite smooth, or apply acetate of lead in the form of powder, filling up all the interspaces between the granulations to make an even surface. In either instance the surplus of the remedial agent is to be carefully washed away.

It is, however, exceptional cases that call for treatment so heroic, the granulations not ordinarily being in such excess that they cannot be removed by lighter applications of the blue-stone crystal, frequently repeated. The majority of the cases coming to the dispensary were of this character, and touching daily with this remedy afforded immediate and marked relief. As the granulations disappear the application can be made at longer intervals, at first two days, then three or four, increasing the interval gradually and watching whether there is any disposition evinced for a return of the disease. Even when the patient is pronounced cured it is better to keep him under observation for some time, to guard against a relapse. As a valuable adjuvant to the direct treatment, we have employed in obstinate cases counter-irritation to the exterior of the eyelid, by means of nitrate of silver penciled over the surface, or tincture of iodine applied in the same manner.

The result was sufficiently favorable to encourage its further use.

Of the complications of trachoma, pannus is the most frequent, but, unless unusually aggravated, does not call for distinct treatment, the vascu-

larity and opacity of the cornea disappearing as the granulations diminish in size and roughness.

The treatment of obstinate pannus, as also of resulting staphyloma, does not belong to the subject of trachoma proper.

Respectfully submitted.

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ERRATTA.

Page 78, line 32, read "scybalæ" for "scyballæ."
Page 79, line 20, read "three-fourths" for "three parts."
Page 82, line 28, read "vaginæ" for "vaginœ."
Page 90, line 4, read "size is represented," etc.
Page 90, line 4, read "plate 8" for "plate 7."
Page 90, line 9, read "plate 8" for "plate 7."
Page 96, line 14, read "plate 9" for "plate 8."
Page 102, line 23, omit the dash between "Tissue" and "Tumors."
Page 228, line 17, read "Multilocular" for "Mutilocular."
Page 251, line 13, read "caruncula" for "caruncle."
Page 251, line 22, read "galactocele" for "gallactocele."
Page 253, line 7, read "adjacent" for "adejacent."
Page 254, line 2, read "fæcal" for "fœcal."
Page 259, line 9, read "upon" after "insist."
Page 259, line 36, read "wall" after "posterior."
Page 260, line 14, read "soluble" for "soluable."
Page 260, line 17, read "the disease" for "it."
Page 264, line 27, read "Pessary" before "figure 1."
Page 267, line 11, read "wall" after "posterior."
Page 267, line 35, read "rectal" for "bladder."
Page 268, line 9, read "fæcal" for "fœcal."
Page 270, line 21, read "infarctus" for "infractus."
Page 309, line 22, read "appear" for "commend itself."
Page 311, line 2, read "resulted" for "proceeded."
Page 332, line 14, read "Pædiatricar" for "Pædiatrica."
Page 346, line 14, read "Pædiatrica" for "Pædiatricas."
Page 356, line 29, read "fæcal" for "fœcal."
Page 328, line 35, read "Menstruum" for "Menstrum."
Page 390, line 34, read "Niemeyer" for "Neimeyer."