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FORMULA

℞ Olei Morrhuæ (opt) ℥vii.
Ferri Phosphat. ʒ ii.
Phosphori gr. i.
Glycerini, etc., q.s., ad. ℥xv.
Sig.—Take as directed by attending physician.

TRADE MARK Ferrol REGISTERED.

With Creosote

℞ Olei Morrhuæ (opt.) ℥vii.
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Phosphori gr. i.
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Ferrol.—In this preparation we have combined in the form of a perfect emulsion, phosphate of iron and cod liver oil, with the addition of a small quantity of phosphorus. The product is smooth and of uniform strength and supplies an excellent tonic food for use in wasting diseases and during convalescence.

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Ferrol, an honest emulsion of cod liver oil, has been on the market for some years and given great satisfaction It is a Canadian preparation, made from the purest and best oil procurable. The formula is on every bottle and it deserves the support of the medical profession. The manufacturing of this preparation has lately been taken over by the Ferrol Company of Toronto. It is the intention to push the sale in every legitimate way possible, but always and only through the medical profession and press.—*The Canadian Practitioner.*

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We beg to call the attention of the profession to the preparation known as Ferrol—Iron and Cod Liver Oil. It is an excellent preparation, and when combined with creosote most useful in those cases where these products are indicated. The manufacturers are appealing to the profession alone and not to the general public, desiring in the most ethical manner possible to have its merits fully tested and reported upon.—*Medical Review.*

THE FERROL COMPANY OF TORONTO, LIMITED.

The Canada Lancet.

VOL. XXXI.] TORONTO, AUGUST, 1899. [No. 12.

SOME OF OUR RESOURCES IN THE DIAGNOSIS, CLASSIFICATION AND TREATMENT OF CYSTITIS.*

BY E. C. DUDLEY, A. M., M. D.,
Professor of Gynecology, Northwestern University Medical School, Chicago.

When the diagnosis of cystitis was based upon the presence of pus in the urine and painful and frequent urination, its treatment gave less satisfaction to the physician and less relief to the patient than that of almost any other inflammatory disorder. Now these symptoms, pyouria and painful and frequent urination are recognized as results not only of inflammation of the bladder but as well of a variety of other lesions, especially lesions of the ureter, kidney and urethra. Moreover the cystitis itself which is often thought of as a distinct disease is now almost relegated to the rank of a symptom and is properly considered solely in its relations to certain deeper lesions which individually or collectively may underlie and perpetuate it or may result from it. Within a single decade the management of this symptom has risen from the plane of empiricism and has taken its place upon the scientific basis of pathology. This change has come about chiefly as the result of two causes:

1. Etiological investigations especially including bacteria.
2. Improved instrumentation in diagnosis and treatment.

Etiology.†

It is most important to distinguish clearly the predisposing from the exciting causes. Among the predisposing causes are:

1. Pathological urine.
2. Retention of urine.
3. Tumors.
4. Foreign bodies, especially stone.
5. Trauma.
6. Any local of systemic cause of congestion or blood stasis.

These were formerly considered the essential causes of cystitis.

Vastly preponderating at least among the exciting causes are the pathological bacteria and their products. The bacteria most frequently found are:

1. Bacillus coli communis.
2. Gonococcus.
3 Bacillus tuberculosis.

*Read before Trinity Alumni Association at the Annual Meeting in May, 1899.

†Senn, Trans. Am. Surg. Assn., 1898. Consulted.

The bacteria less frequently found are :

1. Proteus vulgaris Hauseri.
1. Staphylococcus pyogenes.
3. Streptococci pyogenes.
4. Dipplococcus pyogenes.

It is generally agreed that the gonococcus and bacillus tuberculosis are prone to attack the healthy bladder and that they require little if any predisposing causes. On the other hand a normal bladder is said to offer much resistence to the other bacteria, that is, they do not become active except in conjunction with definite predisposing causes.

The following history from Reymond* supports the fact that predisposing causes are necessary to the action of certain bacteria. A boy sixteen years old after great bodily exertion was seized with severe abdominal pain followed soon by fever. Below the umbillicus a painful mass was found which by recto-abdominal examination proved to be a collection of fluid between the bladder and rectum. A large abscess was evacuated by coeliotomy. Although from mechanical causes the urine at the height of the trouble could not be completely evacuated, nevertheless no cystitis or other bladder symptoms appeared. There was no history of gonorrhoea or of any other genito-urinary disorder, and the patient had never been catheterized. Twice before and once after the operation urine, aseptically collected, gave a pure culture of Bacteria Coli Communis only ; ten days later the urine was again sterile. In the evacuated pus bacteria coli communis, staphylococcus albus, streptococcus and other bacteria were found.

This leads to three deductions :

1. Bacteria traversed the bladder wall from the outside to the inside.

2. Of the different forms present in the abscess only the Bacteria Coli passed through the bladder wall.

3. The Bacteria Coli Communis caused no inflammation by its presence. It was only a Bacteriuria.

The infective agent may reach the bladder in any of the following ways :

1. From the kidney or pelvis of the kidney.

2. From the ureter.

3. From intestine and other adjacent structures or organs, especially if they be adherent.

4. Through the blood.

5. Through the urine.

Ammoniacal urine is known to result from the decomposing action of certain bacteria, notably the proteus vulgaris, upon urea ; moreover, the frequent association of alkaline ammoniacal urine with cystitis has given rise to the more or less common impression that the disease depends upon

* Bulletin de la Societe Anatomique de Paris, July 2, 1897, page 583.

the irritating action of urine which has undergone ammoniacal decomposition and that such decomposition is necessarily associated with cystitis. Johannes Miller* of Wurtzburg was the first to upset this idea. He showed that in seventy-three per cent. the cases cystitis urine was acid. Soon after these observations of Miller, Melchoir† reported the results of sixty-two very accurate observations. He found that ammoniacal decomposition was only a minor phenomenon and that in many of the severest forms of cystitis acid urine was present even up to the time of death. Almost all researchers now reach the uniform result that the bacillus coli communia, or a very closely related microbe, is the one most frequently found in cystitis. In one hundred and twenty cases collected by Rostoski‡ this germ was found in eighty cases.

Whenever the bacterium coli communis was found alone the urine was acid; whenever proteus vulgaris, it was alkaline. Alkalinity with bacteria coli communis is said to be always due to the association of other microbes. Some of the following conclusions of Melchoir are most significant:

1. "The bacillus coli communis is most frequently found not only in cystitis but also in pyelitis and suppurative pyelonephritis.

2 "The bacillus coli communis may be destroyed and crowded out by those microbes which decompose urea, and produce alkaline urine.

3. "The bacillus coli communis often appears to cause hemotogenous infection from the intestines.

4. "Pyelonephritis, especially that caused by the bacillus coli communis, is often the source of a secondary cystitis.

5. "Even the microbes which decompose urea may cause pyelonephritis with acid urine and without the presence of complicating cystitis."

Instrumentation and Diagnosis.

Within a few years the cystoscope has revolutionized our knowledge of the pathology, diagnosis and treatment not only of cystitis but of many other hitherto more obscure urinary disorders.

In former times when the principal factors in etiology were stricture of the urethra, foreign bodies in the bladder, and enlargement of the prostate, and when there was no means of viewing the bladder mucoss, the finger through the dilated urethra and the sound were the only and rather dubious means of exploring the bladder. Digital exploration with its attendant dangers was then common practice. As late as 1883 Sir Henry Thompson§ in his work on Digital Exploration reported as the result of two years' observation by that method a ser es of over thirty cases of tumors in the bladder upon which he had operated. Most significant in contrast is the report of Alexander Stein two years

* Rostoki. Deutche Medicinischi Wochenscrift, 1898, s. 235.

† Monatsbericht uber den Gesamtleistung, Heft 10.

‡ Deutche Medicinische Wochenscrift, 1898.

§ Belfield, Am. Gyn. & Obstet. Jour., Jan., 1899.

earlier in which he was able to collect from all the literature, including the post mortem observations, only about twenty cases. * It now remained for the cystoscope to define cystitis and to differentiate it from other intra vesical disorders.

THE CYLINDRICAL CYSTOSCOPE.†—One of the first, if not the first, to employ cystoscopy was Gustav Simon. He used the familiar cylindrical cystoscope with an obdurator through which light is reflected to the bladder by a head mirror. Later, Pawlick in Europe and Kelly in America perfected the instrument and added to its value by placing the patient in the elevated pelvic position. Finally Kelly still further contributed to the usefulness of the instrument by the adoption of the knee breast position.

THE ELECTRICAL CYSTOSCOPE.—The next practical development was the panelectroscope of Leiter in Vienna and later the similar instrument of Casper. Both of these cystoscope carried the electric light ray into the bladder by means of refracting prisms at the external end of the tube. The final development of this instrument began with Nitze in 1876. He placed the electric vocuum light at the inner extremity of the tube in such a manner as to give direct illumination and to transmit to the eye through a series of lenses an exact picture of the bladder mucosa magnified. The electric current was furnished by a battery from which insulated conductors passed through the tube to and from the lamp.

Cystoscopy and urethral exploration in the female owing to the shortness and dilatability of the urethra may be satisfactorily accomplished by means of the simple tubular cystoscope of Pawlick and Kelly. The greater length of the male urethra and consequent greater distance of the field for inspection from the eye and its magnifying power render the prismatic electroscope indispensable. The electrical cystoscope, even in the female, is preferable.

By means of the Cystoscope the entire interior of the bladder may be brought into view; foreign bodies, tumors and other pathological changes may be recognized and the ureters and the pelvis of the kidney may be explored. The instrument has often revealed the presence of stones, tumors and ulcers which had entirely escaped detection by the sound. Numerons cases in which cystitis is of only secondary importance to other associated lesions, such for example as tumors, tuberculosis, piles or hemorrhoides of the bladder are now frequently observed by the cystoscope.

Cystoscopy is of great value in preventing blind and meddlesome treatment for a class of cases which present the subjective symptoms of cystitis but in which inspection fails to show any lesion whatever of the bladder mucosa.

The value of the instrument is also incalculable when only limited areas are diseased, for example, in the mild inflammations of the trigone and in fissure at the neck of the bladder. Under such conditions the

* Belfield, Am. Gyn. & Obstet. Journal, Jan., 1899.

† Viertel, Veits Handbuch der Gynakologie.

operator instead of treating the entire vesical mucosa by means of injections more or less strong may direct any appropriate application to the diseased part only.

THE SEGREGATOR.—Another instrument of great importance is the urine segregator of Harris;* This instrument collects the urine directly and separately as it passes from each ureter into the bladder. To a great extent it supercedes ureteral catheterization. By its use certain dangers of infection of the kidneys by ureteral catheterization may be avoided. The value of this instrument depends not only upon the fact that without ureteral catheterization we are enabled by its use to separate the urine from one kidney from that of the other, but also upon the fact that we temporarily, as it were, eliminate the bladder from the urinary tract. There may be present the subjective symptoms of cystitis, that is, pyouria, painful and frequent urination, and ammoniacal urine, and yet the bladder may be free from disease. It is absolutely necessary to a correct diagnosis of cystitis that we know what abnormal constituents of the urine have their origin within the bladder itself. Normal urine suffers no change in a normal bladder free from microbes, hence a comparison of analyses of urine, taken from the bladder, with urine taken directly from the kidneys may at once indicate the direct location of the disease.

The points to be observed in urine thus obtained are:

1. The reaction.

2. The presence or absence of pathological products, namely, pus, blood, epithelial cells, bacteria, crystals, etc.

The reaction of the urine should be taken at once, as secondary changes occur sometimes quite rapidly. If urine taken directly from the kidneys possess a normal degree of acidity while that from the bladder be alkaline, it is very evident that the pathological process producing the alkalinity must reside within the bladder. If urine from the kidneys be free from pathological products while that from the bladder contain pus, epithelium or bacteria, the involvement of the bladder is unquestioned.

The urine segregator possesses the following advantages:

CLASSIFICATION.

ANATOMICAL CLASSIFICATION.—In our present knowledge of the subject a perfect classification is impossible. Numerous classifications have been proposed.

ANATOMICAL CLASSIFICATION.—According to the special structures involved this comprises: pericystitis, paracystitis, interstitial cystitis and endocystitis. The difficulty, not to say frequent impossibility of separating these varieties one from the other and the fact that two or more usually coexist renders this classification, although diagrammatically attractive, clinically impossible. There are no sharp lines of demarkation between the so-called anatomical forms.

* Adaptations Transactions, Chicago, Gynecological Society, November, 1898.

THE PATHOLOGICAL CLASSIFICATION includes numerous varieties such as catarrhal, suppurative, ulcerative, hemorrhagic, exudative, exfoliative and fissure cystitis These however are rather phases and possible stages than distinct varieties of the inflammatory process.

BACTERIOLOGICAL CLASSIFICATION.—This would comprise as many forms as there are varieties of infective microbes of which the principal ones have already been mentioned. This classification although quite attractive in the laboratory is often impractical at the bedside. It is possible however that the more exact knowledge of the future may give to the bacteriological classification a practical value.

These various classifications, however, from the standpoint of nomenclature are most convenient. Such words for example as gonorrhoeal, acute, chronic, suppurative and interestitial are useful for purposes of description and to designate the various forms and phrases of the infective process. For example, we should use the word endocystitis to describe not a distinct lesion independent of the rest of the bladder and rather an essential part of and inflamed organ.

PATHOLOGY AND DIAGNOSIS.*

Cystitis in the first place must be differentiated from simple irritability of the bladder; this condition often occurs in neurasthenic subjects; it is often of neurotic origin. The diagnosis and treatment are clearly those of the underlying neurosis.

The attempt will not be made to differentiate all the phases and varieties of cystitis but rather to outline the more pronounced types.

In the beginning of cystitis the cystoscope shows the blood vessels to be less sharply defined. Soon the normal light pink, almost whitish, color of the mucosa assumes a deeper and deeper hue until the sharp demarkation between the vessels is lost and the whole surface is finally of a uniform deep red color. The epithelium may then be cast off in small particles from circumscribed, narrow or broad areas, and the surfaces thus exposed may take on a granular appearance. Finally in severe cases one may observe pus-coagulation, excessive swelling and edema of the bladder wall. The urine now contains epithelial detritus and pus cells in large quantities.

The frequency of mixed infection and the presence of other practical difficulties may render it often impossible to distingush between all the different bacteriological varieties; it is however usually possible and is often desirable to differentiate the tuberculous from the other varieties, especially from the gonorrhoeal. The differentiation of tuberculous from gonorrhoeal cystitis is outlined as follows:

Tubercules Cystitis.	*Gonorrhoeal Cystitis.*
1. Located chiefly about the trigone.	1. Not at all so confined.
2. Absence of inflammatory reaction zone.	2. Clear inflammatory reaction zone latter changing to dull brown color.

*Kolisher Die Erkrankungen der Weiblichen Harnröhre und Blase consulted.

Tubercules Cystitis.	*Gonorrhoeal Cystitis.*
3. Local tubular cystitis not very common; general tubular cystitis very rare	3. Of common occurence both local and general.
4. Characterized by the presence of small tubercles situated about the trigone and ureteral orifices.	4. Characterized early by insular areas of inflammation with healthy or nearly healthy intermediate mucosa. Later insular areas becomes confluent and extend over the whole mucosa.
5. No projecting tufts of pus.	5. Projecting tufts of gonorrhoeal pus are apt to be present. In chronic stage regions of elevations may be excavated by ulceration.
6. No subperitoneal extravasation of blood.	6. In very acute stage there is subperitoneal extravasation of blood.
7. Bacillus Tuberculosis.	7. Gonococcus.

The picture here drawn of gonorrhoeal cystitis corresponds in some degree with that of other non-tubercular varieties.

Certain so-called clinical and pathological forms and phases of cystitis may be designated as follows and have great diagnostic significance:

1. Catarrhal cystitis.
2. Suppurative cystitis.
3. Ulcerative cystitis.
4. Exudative cystitis.
5. Exfoliative cystitis.
6. Fissure cystitis.
7. Foreign-body cystitis.
8. Leucoplakia cystits.

1. CATARRHAL CYSTITIS.—A large proportion of the cases of chronic inflammation are of this variety. The term should be restricted to surface infection and to cases in which the product of inflammation comes from the superficial epithelial elements of the bladder mucosa. The disease is marked by moderate swelling, redness and exfoliation of epithelial cells and by profuse mucous discharge. In the chronic stage the muscular layer becomes infiltrated, thickened and hypertrophied. The urine contains epithelial cells, a moderate amount of pus, and is usually acid. Erosions, ulcerations and as a consequence more abundant supperation may follow. Great alkalinity of the urine indicates a rather advanced stage and then the cystoscope will reveal a deposit of grayish white color containing muco-pus, that is, the cystitis originally catarrhal may become distinctly suppurative.

2. SUPPURATIVE CYSTITIS.—In this form the inflammation may have been diffuse from the beginning and have involved both the superficial and deeper structures of the bladder wall. As well stated by Senn the microbic infection is of sufficient intensity to destroy the protoplasm of the pathological products of the inflammation and thus transform the the leucoytes and epithelial and connective tissue cells into pus corpuscles. The urine contains an abundance of epithelial cells and pus. The ulcerative process may involve the deeper structures and in exceptional cases may lead to perforation. The urine is acid, or if ammoniacal, may be so from decomposition due to the intercurrence of microbes other than those which produced the original infection. In the ammoniacal urine, will often be found the diplococcus pyogenes and the proteus vulgaris. Suppurative cystitis both in its acute and chronic stages is prone to invade the ureters and kidneys. In fact chronic uncomplicated cystitis is rare. The cystoscope reveals the local conditions as already described.

3. ULCERATIVE CYSTITIS.—The ulcerative phase of cystitis has already been mentioned as a later stage of the catarrhal and suppurative varieties. The term is here used however to designate that variety in which ulceration is the initial or at least a very early factor. The infection, as described by Senn, "appears to be of a peculiar kind, limited in extent, and the resulting inflammation leads quickly to a circumscribed necrosis. There is usually a single circumscribed ulcer, the so-called 'simple' ulcer of the bladder. This form of cystitis is quite rare and resembles in many respects gastric ulcer and the round duodenal ulcer."*

"Fenwick has seen a number of cases of simple, solitary ulcer of the bladder. The disease is usually met with in young men without a venereal history. The first symptom is increased desire to urinate, coming on suddenly; intermittent haematuria then appears. He describes three stages. In the first stage the urine is acid, the specific gravity high, and pus scanty. In the second stage the ulcer becomes incrusted with phosphates, and fragments of the deposits break off now and then and are passed with the painful paroxysms, or retained to serve as nuclei for calculus formation. During the third stage the bladder becomes contracted, the mucous membrane extensively ulcerated, and ureteral and renal lesions arise. The ulcerative form of cystitis is undoubtedly the result of an infection through the blood, the inflammation attacking the tissues around an infected embolic infarct, and reaching the surface of the bladder by a process of necrosis. Ulceratic cystitis, like gastric and duodenal ulcer, is found more frequently in young adults, and usually without any antecedent or attending predisposing local causes." In the diagnosis the cystoscope is indispensable.

4. EXUDATIVE CYSTITIS.—This is characterized by the formation upon the bladder mucosa of a so-called membrane, hence, it is usually designated by the rather confusing descriptive terms: "membraneous," "diphtheritic," "croupous," or "fibrinous." The exudative membrane is the product of inflammation; it is, in fact; apt to be the product of extensive necrotic changes, and as such, indicates a grave lesion. There may be extensive

*British Medical Journal, May 9th, 1896.—From Senn.

destruction even in the musculature and especially in the deep blood vessels and lymphatics. The urine is usually alkaline. The disease has been chiefly observed during the child-bearing period, and then usually in puerperal women. The urine contains fibrinous shreds or cast-off patches of membrane. Cystoscopic examination reveals a yellowish white membraneous formation which may often be picked off by means of forceps passed through the cylindrical cystoscope.

5. EXFOLIATIVE CYSTITIS.—This variety is analogous to so-called dissecting metritis and dissecting vaginitis. The inflective process and inflammatory reaction is most virulent and intense. It results in the destruction and detachment of the mucosa and together with it sometimes of the muscular layer of the bladder; these may be expelled in fragments with the urine or may have to be removed from the bladder by a surgical procedure. It is the most grave and virulent form of cystitis and is apt to be fatal. The conditions are like those of exudative cystitis intensified. The diagnosis between the two forms depends upon the macroscopic and misroscopic character of the masses removed or thrown off from the bladder. The disease was early and fully described by Boldt.*

6. FISSURE CYSTITIS.—Fissure cystitis is caused by secondary infection of a traumatism at the neck of the bladder or in the trigone. As seen through the cystoscope the fissure is usually covered by a brownish or yellowish exudate surrounded by an œdematous area.

7. FOREIGN-BODY CYSTISTIS.—Cystitis caused by foreign bodies varies with the character of the body and the conditions of infection. A smooth body may be tolerated without subjective symptoms. A rough or angular substance may produce trauma and thus open the way to any form of infection.

8. LEUCOPLAKIA OF THE BLADDER.†—This is characterized by the appearance of grayish or whitish small circumscribed areas usually in the trigone. The epithelium has undergone changes which render it opague and which have been likened to the changes of keratitis. The cystoscope reveals a number of grayish white reflecting spots of a diameter approximating one-fourth inch. These spots while desquamating are below the level of the surrounding mucosa; after desquamation has ceased they become flush with the mucosa. The most pronounced subjective symptom is an intolerable and almost constant desire to urinate. Micturation may be attempted as often as once in fifteen minutes through the day and almost as frequently during the night. Leucoplakia results from long continued chronic areas of inflammation; it may be the starting point of general cystitis.

TREATMENT.

The treatment falls under four heads:

1. Prophylactic.
2. Medicinal.
3. Topical.
4. Surgical.

* American Journal of Obstetrics, June, 1889. † Kolisher.

1. PROPHYLAXIS.*—Numerous autopsies upon subjects who have not suffered from cystitis have shown a hyperemic state of the bladder so marked that it must have been of long duration and yet had not gone to the extent of infection and inflammation. The explanation must be that the infective element had not been present or if present had not become active. On the other hand the question has been raised and usually answered in the negative whether the mere presence of infective microbes alone, tuberculosis and gonorrhœa excepted, can easily produce cystitis. It is commonly, therefore, agreed that infection must usually depend upon first, an abnormal condition of the soil which renders the soil susceptible; second, upon the presence of the bacterial exciting cause. A two-fold lesson is obvious: to keep the bladder in a state of resistance and to avoid the introduction of infective material.

Susceptibility to infection may result from either systemic or local states. The systemic conditions are often the result of faulty elimination and consequent defective circulation. Hepatic and cardiac disorders, kidney insufficiency and constipation at once suggest themselves. We must also have in mind such conditions as anemia, diabetes, rheumatism, gout, lithemia and cholemia. These disorders call for hygienic and medical treatment, for judicious elimination and nutrition. At the risk of seeming to advocate routine measures one may suggest the value of mercurials and salines. The writer has occasionally been gratified at the disappearance of irritation in the bladder from the administration three times a day for a number of weeks of calomel in doses from one-tenth to one-twentieth of a grain supplemented by the free use of natural or artificial mineral waters or of pure water. It is clearly unnecessary to do more than mention the words food, exercise and sleep.

The introduction of the catheter under the sheet, its passage without preparatory disinfection of the vulva, the use of the septic catheter and the slight traumatism which the use of the instrument may cause and the almost certain ingress of septic matter through such traumatism are well known to every intelligent physician. But unfortunately many intelligent physicians, although intellectually cognizant of the facts, are not practically alive to their importance.

The possible relations of parturition to cystitis are most significant; among them are those which arise from certain pelvic defects, such for example as contraction or excessive inclination of the pelvis which may retard or obstruct labor and thereby cause prolonged pressure of the child upon the bladder. Such pressure from any cause is full of danger.

Gestation with a retroflexed uterus finally enlarges the uterus until it becomes impacted under the sacral promonitory; then pressure of the cervix upon the neck of the bladder forces it against the pubes, prevents the complete evacuation of the bladder, and results in the retention of residual urine. This urine necessarily becomes decomposed and is then a most favorable culture ground for bacteria; the inevitable result is cystitis. It is true that the bladder may be displaced by tumors or by other

* Kletsch, Am. Gyn. & Obstet. Jour., Jan., 1899, Consulted.

causes and yet remain healthy even though the displacement produce much congestion, but given the combination of the three elements congestion, decomposed residual urine and bacteria, even though any one alone might be ineffective, the result is unavoidable. The necessity for prompt replacement of the displaced gravid uterus is therefore clear.

It is manifestly important; first, to avoid the introduction of a cause out of which infection may arise, and second, to relieve the patient of any cause which may be present without the introduction of another.*

MEDICAL TREATMENT. The medical treatment already discussed as a part of the prophylaxis has great value in connection with other forms of treatment. The principles are necessarily those of general internal medicine. The particular indications have reference to the use of such drugs as may change the quality or increase the quantity of the urine. If the urine is strongly acid for example it should be diluted by the free drinking of fluids or rendered less acid by the use of alkalies; if alkaline its reaction may be modified by the use of acids. For this purpose benzoic acid alone or combined with borax and dissolved in cinnamon water is a classical and useful remedy. The indication to relieve subjective symptoms is two-fold; first, to allay suffering and nervous irritation, and second, to render the patient less intolerant of topical surgical treatment.

In superficial mild cystitis with frequent urination and mild painful contractions of the bladder, prompt relief sometimes follows the daily application of a recital suppository containing two or three grains of ichthiol. In more aggravated cases opium may be substituted for the ichthiol. The irritating presence of concentrated urine should always be avoided by the frequent drinking of water. In order to avoid frequent urination during the night the drinking may be largely confined to the morning and early afternoon hours. To secure good sleep let the ichthiol suppositories be used two or three hours before bedtime to be followed if necessary by the opium or morphine suppository at bedtime.

The bowels should be kept normally free by mild laxatives. Drastic cathertics should be avoided. Uva ursi, triticum repens, the benzoate salts, buchu, eucalyptus and many other time-honored and classical remedies need no further mention. Rest, especially in the acute stage, is highly important.

TOPICAL TREATMENT.—The washing out of the bladder as a routine procedure is not approved. Irrigation, however, may be positively indicated for the removal of loose irritating shreds or other foreign matter.

The superficial forms of cystitis respond promptly to topical treatment. For these forms, if the cystitis is general, iodoform emulsion ten per cent. in oleum seasame may be thrown into the bladder with a hard rubber syringe. After two or three applications of the emulsion if the bladder is sufficiently tolerant a four ounce solution of nitrate of silver may be injected into the empty bladder and immediately displaced by free irrigation of normal salt solution. The strength of the solution may vary

* Adapted from Kletch.

according to the toleration. Begin with one per cent. and cautiously increase the strength if necessary even to five per cent. This treatment may be repeated every two or three days. Oftentimes two or three mild injections will effect a cure.

In many cases the infection is localized and when localized is usually confined to the trigone or inner end of the urethra. The silver application should then be local and confined only to the affected part. It may be made of any desired strength by means of a cotton swab through the cylindrical cystoscope and kept within bounds by the immediate instillation of salt solution. Mild infections in the trigone often yield completely to a single treatment. Mild fissure cystitis is promptly and permanently cured by this means but aggravated cases may require the solid stick. Accompanying urethritis should be treated simultaneously with the cystitis.

When the infection has caused deep infiltration into the bladder wall as in exudative or diphtheritic cystitis, the treatment is to be conducted in two stages; first, wash out the bladder to remove the shreds and other purtid material; second, apply the disinfectant. In washing out the bladder use small quantities of fluid and repeat until the fluid returns clear; then apply the disinfectant, preferably the silver nitrate.

If the secretion on the bladder wall is mucoid in character and stringy it is better to use salt solution than pure water. When the bladder is so painful as to resist all efforts at treatment it must be anesthetized with 10-20 c. c. of a four per cent. solution of antipyrin and this should be left in the bladder about twenty minutes. If treatment leaves the bladder very painful, cupping, hot applications or opium suppositories are indicated.

Cystitis with granulations or ulcus requires a very long time for healing and this is best accomplished with the silver nitrate in solution or in the solid stick.

In exfoliative cystitis the cause of the disturbance in the circulation should if possible be removed and the gangrenous membrane taken away by means of forceps. A permanent catheter should then be inserted to protect the bladder from the results of distention and for the injection of anticeptic solutions. In these cases the systemic condition is very grave and requires the maximum degree of support.

SURGICAL TREATMENT.—My experience in the surgical treatment has been confined to the cystitis of women. I therefore exclude from this part of the subject all special consideration of cystitis in the male. The following procedures are submitted:

1. Dilatation of the urethra.
2. Vaginal cystotomy.
3. Curettage of the bladder.
4. Lithotrity.
5. Extra vesical operations.

1. DILATATION OF THE URETHRA.—The indications for this operation are as follows: (*a*) To cure localized cystitis in the region of the trigone, commonly called trigonitis and fissure at the neck, so-called, fissure cystitis. The mode of cure in fissure cystitis is doubtless similar to that of anal fissure by dilatation of the sphincter ani muscle. (*b*) To enable the operator to see and treat surgically or topically vesical ulcers, vesical hemorrhoides, small growths, and other affections of the interior of the bladder, and to permit the crushing of stone.

2. VAGINAL CYSTOTOMY.—This is the formation of an artificial vesico-vaginal fistula. It opens the way to intra-vesical topical treatments and operations. Through this opening tumors may be removed and diseased surfaces cauterized or curretted. In chronic cases of severe long continued and unrelieved suffering colpocystotomy has by giving the bladder complete rest, furnishes immediate and unspeakably relief. The operation may have two objects: first, palliative; second, curative. In a certain proportion of cases the disease in the bladder and upper zones of the urinary tract is so extensive that the operation can only be palliative, that is, an anatomical cure is sometimes impossible. In some of these cases the bladder is contracted to the capacity of perhaps one-half ounce. No one would think, under such conditions, of making the secondary operation for the closing of the fistula. In many other cases the artificial opening may be only temporary. It gives the best opportunity for direct local treatment to diseased parts of the bladder and for a most effective vesical douche which can be thrown in through the urthra and allowed to flow out through the fistula and vagina. I have in mind numerous cases of chronic cystitis which have been cured by this method and in which upon subsequent closure of the fistula, the cures, if not anatomically complete, were at least symptomatically satisfactory. In some of these cases the very much contracted bladder finally resumed its physiological caliber.

Colpocystotomy may be indicated for the removal of any foreign bodies; it also furnishes an opening for the cauterization or curettage of ulcers or elucoplakia.

3. CURETTAGE OF THE BLADDER may be made through the tubular cystoscope, but better through an artificial vesico-vaginal fistula. It is indicated in indolent ulcers especially those of tubercular origin.

4. LITHROTRITY AND LITHOTOMY.—A stone in the bladder may be crushed through the urethra or removed through an artificial vesico-vaginal fistula. A small stone, or rather foreign-body may be removed entire through the dilated urethra. Prompt relief from cystitis usually follows.

EXTRA VESICAL OPERATIONS.—Parametritic, perimetritic or tubal abscess may, by rupture into the bladder. cause cystitis. Incision, evacuation and drainage of the pus cavity or removal of the pus sac is usually followed by prompt cure.

As a final stage in the treatment of cystitis the bladder if contracted may sometimes be made to return to its normal size by methodical distention with increasing quantities of salt solution, but this should only be undertaken after the cystitis has been cured.

SUMMARY.

1. The conditions which were formerly considered the prime causes of cystitis have receded to their proper place and must be estimated only as predisposing causes.

2. The recogniton and appreciation of pathogenic bacteria as the exciting causes of cystitis is essential to a scientific understanding of its pathology, etiology and treatment.

3. Alkalinity of urine depends upon the action of certain bacteria notably the proteus vulgaria, in the decomposition of urea. The bacillus coli communis which is one of the most frequent causes of cystitis is one of a class which does not decompose urea and therefore does not produce ammoniacal urine. Contrary to the older opinion, alkalinity is not the rule; on the contrary in the majority of cases the urine remains acid. Alkalinity if present is often the work of microbes secondarily introduced.

4. The classical symptoms of vesical pain, frequent urination and pus in the urine are wholly inadequate as a basis for the diagnosis of cystitis. Moreover the condition called cystitis has receded from the rank of a distinct disease to that of a symptom and should be so regarded. The mere recognition of the fact that cystitis exists is not a diagnosis. A fact is not a diagnosis, and the recognition of cystitis may by contrast with that of its complications be of very minor importance.

5. The diagnosis must comprehend not only the presence of infection in the bladder but what is more important it must embrace the source routes, type and complications and the variety of the inflammatory reaction. Simple uncomplicated inflammation of the bladder is rare.

6. The endoscope and cystoscope can alone open the way to efficient exploration and diagnosis, can alone define the indication for topical or surgical treatment, but more essential can alone prepare the way for the examiner to distinguish between cystitis and a wide variety of other urinary affections of the bladder, urethra, ureter and kidney. One is astounded at the revelations of the cystoscope in the recognition of most important lesions which must otherwise have passed unobserved.

7. The washing out of the bladder as a routine measure is not approved. The injection of disinfectants is indicated only in general or nearly general cystitis. For localized cystitis direct applications to the part affected should be made through the endoscope.

8. Dilatation of the urethra is indicated for localized cystitis at or near the neck of the bladder. The efficiency of the procedure for such localized cystitis has given it an undeserved recognition in the treatment of general cystitis which under cystoscopy it cannot now retain.

9. The most valuable disinfecting topical application in cystitis is the nitrate of silver.

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GONORRHŒA.

DIAGNOSIS.—Neisser maintains that the demonstration of the gonococcus is the only reliable method of diagnosing gonorrhœa in prostitutes. Many cases of undoubted gonorrhœa would escape recognition if clinical evidence alone were relied upon. Several examinations should be made if the gonococcus is not found at first.

According to Chauncey D. Palmer, gonorrhœa in the female is especially prone to attack and linger within the urethra, cervical canal, and the canals of the vulvo-vaginal glands. These are the first and most vulnerable points of attack. Secretions from these places are to be sought, for purpose of microscopical examinations. Gonorrhœa in the female almost always leads to sterility. Sometimes, however, pregnancy follows its occurrence and apparent relief or cure. Not only are such women more apt to have ectopic gestation, but they are particularly prone to attacks of puerperal fever of the metroperitoneal type.

H. Greenberg says that in many cases of gonorrhœa, although the microscope fails to show gonococci, yet it is evident that they exist latent in some folds of the urethra and are liable to regain their virulence under favorable conditions. The same is true in the female; prostitutes apparently free for some time from gonorrhœa nevertheless infect the male urethra.

J. R. Eastman regards the diagnosis of acute gonorrhœa in women as comparatively easy, even without the microscope. A discharge of tenacious pus is usually detected or greenish or yellow streaks upon the linen may alone be in evidence. Erosion may be present upon the skin, upon the labia majora, or in the inguinal and gluteal folds. The labia minora, the clitoris and its prepuce, and the hymen, if present, are red and swelled. The urinary meatus is found to be congested and ectropic. The mouths of the ducts of the vulvo-vaginal glands are deeper in color, gaping, and tender. They discharge, instead of their normal glycerin-like secretion, pus-laden mucus. The surface of the vagina proper presents no great change The urethra is the seat of predilection of gonorrhœa in women.

In gonorrhœa in the female P. Broese and H. Schiller do not consider the intracellular arrangement of the cocci as pathognomonic of acute gonorrhœa, as the gonococci are quite frequently found outside the cells. The diagnosis of chronic gonorrhœa may be established upon the shape and size characteristic of the gonococci and upon their peculiar reaction to the Pick-Jacobson method of staining. In acute urethritis a differential diagnosis can be made with greater accuracy by observing the clinical course than by microscopic examination. If the urethritis be non-specific the objective and subjective manifestations disappear spontaneously and with comparative rapidity, and the adjacent portion of the genital tract will not be involved. Too much reliance must not be placed upon the absence of gonococci from the secretion from the cervix, as their presence

in the secretion is most irregular. In thirty-six cases of acute gonorrhœa, in all of which gonococci were found, the cervix was, next to the urethra, the most common seat of the disease.

F. C. Valentine says that—if in a case of recurrent gonorrhœa marital reinfection can be excluded by (*a*) examination of the woman; (*b*) infarction of the crypts, glands and follicles by urethroscopy; (*c*) chronic residual posterior gonorrhœal urethritis by expression of the posterior urethra and posterior urethroscopy; (*d*) gonorhœal prostatitis by massage of the prostate—then one must look for gonorrhœal vesiculitis.

The local manifestations of the last three conditions are grossly the same, differing only in detail.

For such an examination it is best to place the patient on a sofa, lying on his back. The apex of the index-finger and the bed of the nail being tightly packed with soap and then thickly anointed with vaselin, the finger is gently inserted into the rectum. The other hand rests above the pubis to steady and press down the pelvic viscera. The pulp of the finger is turned toward the front of the patient, and lightly outlines the prostate, but exercises not even the slightest pressure on any part of it. If the operator desires to elicit evidence of chronic residual posterior gonorrhœa, he lets the finger glide from the prostate and exercises pressure, with increasing force, in a stroking motion forward from the lowermost margin of the prostate, endeavoring with each stroke to force the posterior urethra against the posterior aspect of the pubis.

The patient is then ordered to urinate, and, if this is the region affected, the urine will contain flakes, perhaps even filaments or shreds. Microscopy of these products of massage will reveal the character, probably gonorrhœal, of the posterior urethritis. If this results negatively, examination for prostatitis may be made in the same manner several days later. The size, shape, and hardness or softness of each lobe, as well as of the isthmus, should be ascertained; lobulation or smoothness should be elicited, depressible points located, and the protastic juice—if any exudes from the meatus—microscopically examined. If none escapes, the first urine the patient passes after this massage of the prostate should be centrifugalized for examination.

If the prostate is found to be normal, then the patient should be examined two or three days later for seminal vesiculitis. This is done in the same manner, except that the finger is passed up the rectum farther, beyond the prostate and to its sides. In health the seminal vesicles can be barely, if at all, felt. When enlarged by disease they assume the shape of more or less tensely-filled little sausages. In engaging the finger as high up as possible on these bodies, by curving the finger downward and toward the centre with increasing force, the seminal vesicles may be stripped of their contents. These are treated in the manner as described under the examination for prostatitis.

Ahman notes a case in which gonococci existed in the blood. The case was one of urethral gonorrhœa complicated with multiple arthritis, tenosynovitis, epididymitis, and nephritis, accompanied by attacks of pyrexia

During an attack of fever a syringeful of blood was taken from a vein and spread over four ascites-fluid agar plates. The results showed pure cultures of the gonococcus.

ETIOLOGY.—Cnopf regards gonorrhœa in childhood as twice as common below as above the age of 6 years. Girls are much more frequently infected than boys. In only 1 per cent. of the cases noted was the disease attributable to immorality.

Joseph B. Bacon believes that many cases of rectal gonorrhœa are caused by using the same syringe that has been used for the vaginal douche.

Jadassohn reaches the following conclusions in regard to immunity and superinfection in chronic gonorrhœa :—

1. That there is no diminution in infectiousness in chronic gonorrhœa, —that is, it may produce an acute gonorrhœa in others : also that there is no immunization of the system through gonorrhœa of one of the organs, for a chronic urethral discharge may produce acute gonorrhœal ophthalmia in the same individual.

2. After gonorrhœa of any mucous membrane there is, as a rule, no immunity for that membrane even for a short time.

3. It is not known how a mucous membrane gradually becomes accustomed to the presence of gonococci, though for other individuals or mucous membranes they have lost no virulence. Wertheim showed that a mucous membrane affected with chronic gonorrhœa did not react to cultures taken directly from it, although it reacted to cultures taken from another patient.

4. In spite of this, it is certain clinically that some chronic gonorrhœas may become acute through superinfection with their own cocci.

5. The mucous membrane does not become so used to the presence of the cocci that the latter can live as saprophytes on it after the tissue has become normal. On the contrary, the inflammation always remains for a time after the cocci have disappeared.

6. The superinfection of a chronic gonorrhœa with gonococci from another source is an unsettled question. From the author's experiments, a chronic gonorrhœa may become acute through (*a*) the increase of its own gonococci ; (*b*) inoculation with gonococci from another patient. In other cases it reacts to neither of these causes, and proves an exception to the rule of the absence of immunity.

COMPLICATIONS.—Harvey W. Cushing has reached the following conclusions as the result of the study of two cases of diffuse gonococcic peritonitis :—

1. The gonococcus is capable of causing a specific infectious disease—namely : gonorrhœa—and at the same time other and less specific pathological conditions.

2. There is experimental proof that in certain small animals the gonococcus can set up acute alterations in the peritoneum homologous with the acute septic serositides in man, but differing from these in their tendency to rapid and spontaneous healing.

3. Hitherto there has been wanting conclusive proof that, in the peritonitides attendant upon gonorrhœa occurring in women, the gonococcus was solely or chiefly concerned. The inflammations had been carefully regarded as mixed infections and chemical inflammations.

4. The two cases above noted bring for the first time convincing evidence of the existence of a diffuse. general inflammation of the abdominal cavity caused by the gonococcus.

5. It has been recognized that extension of the gonorrhœal infection from the genital organs to the peritoneum may occur in the puerperal state; a similar sequel is shown to be possible during menstruation.

6. Such ascending forms of gonorrhœa doubtless under ordinary circumstances remain localized in the pelvis, and rarely demand surgical investigation in the acute stage.

7. A general involvement of the peritoneum such as occurred in two cases observed must either be rare or unrecognized, and may depend upon some especially receptive condition of the serosa or virulence of the organism.

8. The peritoneum is not more immune than are the pericardum or endocardium to gonococcic infection, and, being more exposed, suffers more commonly in females, although the relatively-benign course of the disease makes it a rare condition to come to the attention of the surgeon in the acute stages.

PATHOLOGY.—According to Leleneff, gonococci have a most destructive action on cellular protoplasm, causing it to degenerate and liquefy, leaving only a feebly-staining, vacuolized nucleus. As similar changes have been observed both in cells containing gonococci and in those cells free from them, this destructive action must be due to some toxins produced by the gonococci. The latter chiefly invade epithelial cells and leucocytes. It was formerly supposed that gonococci only invaded columnar epithelium, and did not penetrate deeper than the submucous layer, but it is now proved that they may invade squamous epithelium and connective tissue, and even penetrate between the bundles of muscular fibres.

TREATMENT.—Robert W. Taylor believes it proper and justifiable to employ the abortive treatment in all cases that are seen sufficiently early but thinks success in this line will be the exception rather than the rule The routine treatment to be adopted in the average case includes careful regulation of the diet, with the exclusion of those articles that render the urine irritating, the enforcement of a light diet, and the administration of alkalies, with hyoscyamus. In the acute stages hot embrocations of concentrated boric acid should be employed for the first few days, associated perhaps with gentle injections of small quantities of this solution. Upon the subsidence of the distressing symptoms, mild antiseptic injections, beginning with boric acid and continuing with potassium permanganate, should be used. For this a reflex catheter is to be used, if the anterior urethra alone be involveed, and an ordinary velvet-eyed catheter (No. 10 or 12, French) for the posterior urethra. When acute suppuration

begins to subside, the patient may use, with an ordinary penile syringe, injections of zinc, lead, alum, tannic acid, or hydrastine, as a basis. The indications for treatment, based upon the pathological findings of the stage of the decline of the inflammation, are to cause absorption of the infiltration in the submucous layer and to restore the tonicity of the vessels and the epithelial layer of the urethra. No preparation meets all these indications so well as argentic nitrate. The strength of the silver solution and the frequency of injection must be governed by the character of the secretion. As long as there is much free pus and no epithelium in the specimen, the weaker solutions should be used, but, as soon as epithelial cells begin to appear, the strength of these solutions should be gradually increased.

Kornfeld recommends largin, a gray powder produced by the action of an ammoniacal solution of oxide of silver on an alcoholic solution of the dry product of decomposition of the paranucleoproteids, In a solution of 1 in 4000 it kills the gonococci.

Pezzoli has reached the following conclusions in regard to largin gonorrhœa: 1. Largin as an antigonorrhœic is at least equivalent to the other silver compounds, 2. It surpasses the other silver-albumin compounds with regard to the power of killing the gonococci. 3. It penetrates more deeply with dead organic substances. Treatment should begin early to prevent immigration of the gonococci into the deeper parts of the mucous membrane. It may be injected in 1 to 1½ per cent. solution several times a day and retained in the urethra for from ten to thirty minutes.

Goldenburg is in accord with Neisser that protargol surpasses all other agents hitherto in use for the treatment of gonorrhœa. If the disease is localized in the anterior urethra the patient should inject 3 drachms of a 1 per cent. solution with an ordinary urethral syringe, should retain the solution for from ten to fifteen minutes, and should repeat the practice three times a day. In posterior urethritis a solution of ½ to 1 per cent. is introduced into the deeper urethra by a Guyon instillator.

E. Finger has given protargol, the new silver-proteid compound, a careful trial in forty cases of acute gonorrhœa, most of them being seen during the week of the infection, and none of them having been previously subjected to other treatment. He agrees with Neisser that protargol is a very efficient anti-gonorrhœal remedy, which, if employed at an early period, exerts a prompt and favorable influence upon the course of the disease, in the majority of cases, arresting all acute manifestations, causing rapid disappearance of the secretion and gonococci, preventing extension of the process to the posterior urethra, and usually giving good results even in fully developed cases of anterior and posterior urethritis. The injections of protargol (¼ of 1 per cent. to 1 per cent.) should be kept up for a number of weeks, after which astringents should be resorted to in order to prevent recurrenee.

Paul Noguès thinks that protargol injection should be made as soon as the patient with gonorrhœa presents himself. Three are given each day; the morning and afternoon injection should be retained five minutes, the

evening thirty. Since it is tiresome to keep the urethra closed with the fingers for this one injection of a half-hours duration, six, of five minutes each, are substituted. After a few days the evening injection only is necessary, and this should be continued for three or four weeks. A syringe of at least 4 drachms' capacity should be chosen. The strength of the solution is from 0.25 to 0.50 and later to 1 per cent.

Saloschin has used protargol in the gonorrhœa of women and thinks that it is likely to be serviceable in this disease. In 8 cases of acute disease it was applied in 5 per cent. solution through a speculum to the cervical canal, the vagina was treated with a 2 per cent. solution, and a tampon moistened in the first-named solution was left in position. In the sub-acute variety, and especially complicated with cystitis, irrigation of the bladder with a ½ to 1 per cent. solution gave variable results in ambulant patients.

Colombini finds protargol valuable in gonorrhœa. He always keeps a 10 per cent. solution, which is prepared by pouring 5 cubic centimetres of neutral glycerin into a small mortar, and adding to it 10 grammes of protargol, stirring up the mixture with a glass rod till a thoroughly homogeneous moist paste is produced. This is next diluted with 95 cubic centimetres of cold sterilized water, and shaken up till a perfection solution is produced; this solution is kept in a colored bottle in a dark place. As required, a 0.25 per cent. solution is made by mixing 2½ cubic centimetres of the standardized solution with 97½ cubic centimetres of sterilized water; a 0.50 per cent. solulion by mixing 5 cubic centimetres with 95 cubic centimetres of water; a 1 per cent. by mixing 10 cubic centimetres, and a 2 per cent. by mixing 20 cubic centimetres of the standardized solution with 90 and 80 cubic centimetres, respectively, of sterilized water. These solutions are used as urethral injections according to the stage of the disease. In the acute stage the 0.25 per cent. solution is used. The patient first passes water, and then the glans and prepuce are washed with some antiseptic solution and a syringeful of protargol is first injected in such a way that sufficient room is left for the outflow of the injection; then the syringe (which is made to hold 6 cubic centimetres) is refilled to two-thirds of its capacity and the solution is injected very slowly, the meatus being completely blocked, so that it may not run out again. The syringe is carefully removed, the patient being directed to keep the meatus closed with his fingers for fifteen minutes, and not to pass water an hour. As the inflammation subsides, the strength is gradually increased up to 2 per cent. The solution is injected at the temperature of the air. The first day one injection is given, the next one in the morning, and another in the evening; the third and following days one in the middle of the day as well. The injections are continued for twenty days after the cessation of the discharge, the daily number being gradually diminished to one.

Behrend notes twelve instances of gonorrhœa in males (first attack) in whom, after one or two days the gonococci disappeared under the use of ½ to 1 per cent. solutions of protargol. This remedy had no influence upon the clinical symptoms, the discharge continuing. Better results

were obtained by the use of other astringents, as the alum injection, although the latter does not destroy the gonococci. The disadvantage of the protargol is that it acts only on the gonococci which it can reach, for it does not penetrate into the tissues.

Gravagna has tested various new drugs—alumnol, protargol, argentamin argonin—in a number of cases of gonorrhœa. Microscopical examination showed the presence of gonococci long after the onset of treatment. The disease is not cut short by these drugs; although there are no advantages in these drugs over the older ones, they have no disadvantages.

Chassaignac has treated 500 cases of gonorrhœa in various stages of the disease with chlorinated soda. All cases improved except those which were too acute to syringe, and some cases which were very chronic. Three solutions of different strengths—1 in 48, 1 in 32, and 1 in 24—were used, the strong for old cases, the medium for most cases. The solution must be pure and comparatively fresh. It is used three or four times a day at first, afterward twice a day, and injected with a syringe holding three-eights of an ounce, the injection being retained for two or three minutes. Treatment is continued till the "morning drop" disappears and the threads have ceased to appear in the urine after moderate indulgence in alcohol.

Chauncy D. Palmer regards copaiba as still the most reliable remedy for internal medication. For specific inflammations of the urinary, not genital, tract it is indicated. When vaginal or intra-uterine it can he no good. The mercuric bichloride is one of the most safe and efficient parasiticides for this disease. Urethral and vesical injections should not exceed 1 to 20,000 to 1 to 30,000 in strength, but the vagina and uterus will easily bear from 1 to 1000 to 1 to 2000. A frequent practice personally has been to thoroughly scrub the vagina and vulva with German green soap, irrigate it thoroughly with hot water, and forcibly mop the whole vaginal and vulvar tract with the sublimate lotion 1 to 2000 strong. If the disease is intra-uterine, the patient should be anæsthetized, and the uterine cavity dilated, curetted, and washed out with a lotion of the same strength. After the cavity has been dried with sublimate gauze, about 20 to 30 drops of pure carbolic acid may be injected with an appropriate syringe.

J. F. W. Ross believes that the currette should not be used in the presence of acute gonorrhœa, as it is one of the surest ways of causing extension of the disease to the tubes and ovaries.

In gonorrhœal epididymitis Letz uses a 10 per cent. guaiacol ointment made with vaselin or a 5 per cent. ointment if the skin is tender. The scrotum is first washed with soap and afterward with ether. The ointment is applied during the first or acute stage of the disease, when there is pain and swelling of the testicle and pyrexia. These symptoms disappear in three to five days. In chronic epididymitis the guaiacol is best replaced by Zeissl's ointment of a 1 to 2 per cent. extract of belladonna, with equal parts of simple ointment and unguentum diachyli. Fifteen

grains of salol should be given thrice daily as an adjunct to the treatment. Fifty cases of gonorrhœal epididymitis have been successfully treated in this way.

C. S. Murrell advises the prolonged use of hot water irrigations in both acute and chronic gonorrhœa. A soft catheter is passed to within one inch of the prostatic urethra. It is then connected with a "gravity apparatus," in which the water is gradually heated up to the tolerance-point. The stream flows through the catheter and then back between catheter and mucous membrane, thus flushing out the anterior urethra. Several quarts of warm water are thus passed, some patients having a tolerance-point as high as 180° t 190° F.

Aboutkoff found in 5 cases of gonorrhœa in which the temperature rose to 104° F. and upward, owing to complications, that the urethritis was quickly checked, due to the sensitiveness of gonococci to changes of temperature.

Dupuain finds the following injection useful in acute gonorrhœa :—

℞ Methyl salicylate, artificial, 15 minims.
Bism. subnit., or, better, salicylate, 2½ drachms.
Liquid vaselin, 3½ ounces.
M. Sig.: Shake well before each injection.

J. B. Bacon treats gonorrhœa of the rectum by keeping the patient at rest and using a double tube just within the sphincters for irrigation purposes, gradually inserting the tube with an outlet for the flow of water. The bowel should be irrigated several times daily with hot water or with a mild antiseptic solution.—*Monthly Cyclopedia.*

CONVULSIONS IN CHILDREN.

ETIOLOGY.—In three children otherwise healthy Darey has noticed convulsions accompanied by stupor caused by adhesions of the foreskin to the glans penis. In every case the symptoms promptly disappeared on removal of these adhesions.

C. G. Lucas says that he always makes it a rule, when called to see a child with convulsions, to make a thorough examination, even inspecting the prepuce of the male, to ascertain, if possible, the cause. The majority of cases of convulsions in children personally seen have occurred in scarlet fever.

P. F. Barbour thinks that the causes of convulsions vary somewhat with the age of the child. In a child under six months of age the convulsions are nearly always due to cerebral cause or a marked reflex. In an infant between six months and two years of age the predisposition is almost always rachitic, though improper food by itself is sufficient to cause it. After two years of age the convulsions are usually either meningeal or epileptic. At the beginning of acute infectious diseases, or some days after the onset of these diseases, most children will develop convulsions if the temperature rises sufficiently and with sufficient rapidity. When a convulsion occurs three or four days after the onset of scarlet fever or diphtheria. it is generally due to nephritis or beginning uræmia.

Thomas Butler thinks that convulsions in children between the ages of six months and two years are not nearly always rachitic in character. The majority of cases of convulsions that he has seen in children have been between the ages of six months and two years, and none of them were rachitic.

According to Walter F. Boggess, Sachs divides convulsions into the following classes :—

1. Convulsions occurring in first few days of life are, as a rule, the result of meningeal hæmorrhage, due either to protracted labor or instrumental delivery. Personally it is thought that there are few cases where instrumentation, properly employed, ever produces permanent injury.

2. Convulsions may be due to organic disease of the brain, tumor, abscess, meningitis, or vascular lesions.

3. They may (and do generally in children under two years of age) mark the onset of acute infectious disease. The rigor of the adult is shown in the child as a convulsion.

4. Convulsions of reflex origin. Here, according to personal experience, is found the most common source of etiological explanations. There is such a myriad variety of peripheral troubles that can, and sometimes do, bring about such convulsive seizures that it is not surprising that one looks to these first in the examination : dentition, adherent prepuce (very common), burns, sores nasal obstructions, ocular deficiencies, overloaded colons and stomachs, presence of intestinal parasites, lumbricoids, pin-worms,

thread-worms, etc., stomachic and intestinal indigestions. In these indigestions, however, the cause is probably not so much reflex, as it is due to conditions of autointoxications, which factor was overlooked by the older writers. These should be classed under the following heads :—

5. Convulsions due to organic and inorganic poisons, such as ptomaines, toxins, uræmia, lead, and other metallic salts. In this class the convulsions of the infectious diseases might be placed.

6. Convulsions from exhausting diseases, and anything that lowers vitality, lessons development, interferes with proper nutrition and assimilation: rickets, scrofula, rheumatism, severe loss of blood,—the hyperæmic condition of the cortex explaining the relative frequency of convulsions in rickets.

7. Convulsions may sometimes be idiopathic or hereditary. While the convulsion is not inherited *per se*, there is an inherited susceptibility of the nervous system to the various nervous disturbances: neurotic tendency. It is not uncommon to find frequent convulsive seizures in a child for which no assignable cause can be given except that it has been for generations a "family trait."

Convulsions may occur after traumatic injuries as an expression of shock.

TREATMENT.—According to Foulis, cyanosis in convulsions is due to the obstruction offered to the free ingress of air into the lungs by the falling back of the tongue on to the wall of the pharynx. By simple lowering forward the base of the tongue this obstruction is done away with, air passes in freely, and the cyanosis rapidly disappears. Pulling forward the tip of the tongue when the tongue-muscles are lax is not nearly so useful.

In the treatment of infantile convulsions P. F. Barbour uses chloroform, if at hand; hot water is probably the next best thing.

Louis Fischer says that the history of an overloaded stomach, with a consequent high fever and ptomaine poisoning, and the absorption of this poison-causing toxæmia, will call for, first cleansing of the stomach with lavage, using a normal saline solution—cleaning as much as possible therefore with warm salt water until the gastric contents have been removed. Meanwhile, a strong mustard foot-bath can be used to relieve the cerebral hyperæmia, and, if necessary, a leech can be applied behind each ear over the mastoid process of the temporal bone.

Leeching can also be accomplished by applying one leech to the alæ nasi.

W. F. Boggess states that in an attack of convulsions the child should at once be put in a hot bath (90° to 97°) with cold to its head. A strong child may stay in the bath ten or twenty minutes, a delicate child from two to five minutes. Bowels should be at once unloaded by a large enema. If overloaded stomach is suspected, wine of ipecac or alum and molasses, etc., should be given. The child should then be placed on a cot or bed, and if convulsions continue ether or chloroform may be given tentatively

to relieve symptoms until other systemic medicaments can be employed. The chief of these are the bromides and chloral-hydrate. If the child can swallow, from 2 to 5 grains of bromide of potassium or bromide of sodium with from 1 to 2 grains of chloral should be given every fifteen to thirty minutes for four to six hours to a child of one or two years. If the child cannot swallow, double this amount can be given by the rectum. While opium is of great value in controlling nervous excitement and even convulsions itself, it should be given guardedly.

It would be unwise to give opium in great congestion of the brain or in coma. It is best administered by hypodermics in form of morphine, in $\frac{1}{20}$ to $\frac{1}{30}$ grain doses. Nitrite of amyl is highly recommended in certain forms of convulsions given either by the mouth in $\frac{1}{2}$ drop doses or by inhalation. Constitutional treatment should at once be instituted in cases due to systemic conditions, rickets, etc. Musk, valerian, and asafœtida are sometimes useful adjuncts in the treatment.

H. N. Leavell thinks the treatment should be directed toward relieving the constitutional condition which gives rise to the convulsion rather than to the relief of the paroxysm itself. The application of heat will do more toward relieving the condition and bring about a better circulation than will the administration of a general anæsthetic.

A combination to empty the bowel, to tone down the nervous system, and reduce the fever at the same time is calomel and phenacetin.—*Monthly Cyclopedia.*

A CLINICAL STUDY OF TWENTY-FOUR CASES OF PARALYSIS AGITANS.

WITH REMARKS ON THE TREATMENT OF THE DISEASE

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Paralysis agitans, or creeping palsy, has had but little added to its clinical delineation since the original description by James Parkinson in 1823. Despite the many careful investigations of the nervous system that have been made by the aid of modern methods, the nature of the disease is still unknown. Although classified as a functional nervous disease, pathological changes are almost invariably found in the central nervous system after death, especially if the disease has existed for a long time. The object of the present study is not to throw light on the pathogeny of paralysis agitans, but to consider its attributed and apparent causes, to estimate its relative frequency, to determine the initial symptoms and mode of onset, and to learn the factors that influence the course of the disease. The cases are taken from dispensary, hospital, and private practice, in about equal proportion. In order to estimate the relative frequency of paralysis agitans, we have taken the statistics of the clinic for several successive months, as it is impossible to approximate the number of nervous diseases that have been seen during the encounter of these twenty-four cases of paralysis agitans. In five hundred and thirty-six successive patients in the clinic, there were seven undoubted cases of paralysis agitans, and one doubtful case, making a percentage of 1.30. This is much higher than that given by many writers, such as Berger, who found a percentage of 0.62 in six thousand cases, although our figures are practically the same as those given by Charcot. The fact that the clinic is made up in considerable measure of patients sent there by physicians for consultation and advice may explain the relatively large percentage in our statistics. It is easy to understand that such statistics, therefore, have a restricted value in showing the frequency of paralysis agitans relative to all nervous diseases.

The accompanying table shows the relationship of age, nationality, and heredity to the occurrence of the disease:

Nationality.

Nation.	Males.	Females.
United States	2	2
Holland	1	
England	1	
Germany	2	2
Ireland	9	2
Austria	1	
Russia	2	
Total	18	6

Age.

Decades.	Males.	Females.
Thirty to forty years	1	
Forty to fifty years	6	1
Fifty to sixty years	5	2
Sixty to seventy years	4	3
Seventy to eighty years	2	
Total	18	6

Heredity.

	Males.	Females.
Direct heredity	3	1
Indirect heredity	3	1
No heredity	8	3
Unknown	4	1
Total	18	6

The most striking feature in reference to nationality is the remarkable predominance of the Irish race. Very nearly one-half of all the cases were of this people. When we consider that the constitution of the clinic is not conspicuously Irish, it will readily be seen that this preponderance is not to be explained by accident. It may be that the Irish, being a very emotional race, are more vulnerable to the attributed exciting causes of paralysis agitans: shock, anxiety, worry, depression, etc. It is not improbable, however, that it is in part explainable by the entirely different mode of life which the people of this race have when they take up their abode in this country, as no one has pointed out that the Irish are particularly afflicted with paralysis agitans at home. In other words, it would seem to be as much environmental as inherent. Another peculiar feature of the statistics concerning the nationality of the patients is the relative infrequency of the disease in Irish women, contrasted with the women of other nationalities. For instance, the Americans and Germans furnish an equal number of men and women. Many German and French writers maintain that there is very little relationship of sex to the occurrence of paralysis agitans. It will be seen that our statistics show that the occurrence of the disease is three men to one woman. Gowers gives the proportion in his experience as five men to three women.

Our statistics regarding the age at which the disease is most apt to show itself are in accord with those of most writers on the subject. The disease occurs most often in the fifth decade, and gradually diminishes

until the eighth decade. Unlike many other writers, we have encountered two typical cases after the seventieth year. No patient under thirty years of age has been under treatment during the period of personal direction of the clinic, although previous to that time a typical case of paralysis agitans in a boy twenty-two years of age was under observation for a prolonged time. This case is not included in the statistics.

A fact brought out by our study that is not in entire accord with the statements of other writers on this point is the influence of heredity. In no less than four cases was there a straightforward history of direct inheritance. In one case the father had paralysis agitans, while the mother and a maternal uncle died with some form of paralysis. In a second case the mother had a disease similar to that of the patient, the shaking being particularly marked when she was excited. In a third case, the father had an exactly similar disease for the last eight years of his life, and it is thought a paternal uncle was similarly afflicted; while in a fourth case, a woman, the father and a paternal aunt had exactly the same disease. Naturally, this information was obtained only from the patient or the descendants of the patients, and is therefore liable to serious errors. A very careful inquiry was made in every case on this point, with the above result, which is so at variance with the usual teaching on this subject that we are ourselves loath to accept it as absolute fact. A history of indirect heredity—that is, of manifestations of nervous or mental disease in the family—was found in sixteen per cent. of the cases. Upward of fifty per cent. of the cases gave neither direct nor indirect neuropathic history.

In regard to occupation, the statistics show that the patients were very evenly distributed among upholsterers, plasterers, gardeners, saddlers, engineers, printers, laborers, sailors, mill hands, promoters, journalists, clerks, merchants and fancy workers. Neither the mentally harassed nor the physically overworked have a special liability to the occurrence of the disease. Workers out of doors develop the disease as frequently as indoor workers. The statistics further show that the disease is as likely to occur in one grade of society as in another. Of the six women, four were married, one was a widow, and one single; while of the eighteen men, sixteen were or had been married, and two were single.

Inquiry to determine the alleged causes of the disease did not result in obtaining satisfactory information. Only about thirty-five per cent. of all the patients were able to inform us of a distinct cause. The attributable causes were: 1. Shock attending the death of a beloved daughter. 2. Excessive and prolonged mental strain, incident to supporting a family. 3. Family trouble. 4. Constant exposure and becoming wet, incurred in occupation. 5. Contact of the hand with cold stone in winter, while employed in polishing marble. 6. An attack of grippe. 7. The sudden appearance of a strange black cat near her bed. 8. The discovery that an unmarried daughter was pregnant. 9. Being knocked down by a vehicle, but without consequent physical injury. 10. The discovery that all his savings had been lost. Thus it will be seen that the alleged causes were profoundly those that may be classified under the head of psychical or

emotional trauma. Our experience in this respect corresponds with that of others, although, perhaps, the proportion in which an attributed cause was elicitable was somewhat greater than in those of other writers. It has frequently been stated that acute and chronic diseases of various kinds have a predisposing influence to the occurrence of paralysis agitans. This statement is corroborated to a slight extent by our study. Of the six women, four denied any previous disease. One had had a fungoid growth removed from the uterus shortly before the occurrence of paralysis agitans; one had had chronic diarrhœa. A third patient had had yellow fever a great many years before the occurrence of the disease for which she came under our observation. Of the men, one gave a history of a blow on the head, after which he had been delirious for three months; but this had occurred so long before the manifestations of Parkinson's disease that it could not possibly have any influence. Another had had an attack of acute articular rheumatism before the manifestations of the disease; while a third, in whom the symptoms seemed to follow an attack of grippe, has already been mentioned. Two of the men had had yellow fever, eighteen years and forty years, respectively, previous to the manifestations of paralysis agitans. Only two of the twenty-four patients were hard drinkers or smokers, and in none was there a history of syphilis. As a matter of fact, the most striking feature of the personal history of all these patients was that they had lived temperate, wholesome lives, apparently devoid of undue strife or any uncommon burden. In a few cases the patients alleged that the onset of the disease was coincident with some annoying or exciting experience. For instance, one man was quite positive that the disease occurred immediately after leaving the witness box, where he had been subjected to a harassing cross-examination. Another patient dated the beginning of the tremor from the moment when he heard that all his savings had been lost, owing to the failure of a bank. But in both cases close inquiry revealed that muscular rigidity had antedated these experiences by a number of months. A third patient averred that the tremor developed while he was lying in bed convalescing from an operation for inguinal hernia, but investigation showed that the surgeon had diagnosticated paralysis agitans on the man's admission to the hospital.

This brief review of the ætiology of paralysis agitans shows that the most important factors are age, sex, nationality, morality, violent emotions, especially depression, direct and indirect heredity, and infectious diseases. Apart from the peculiarities of our own statistics relative to these factors, and which have already been mentioned, the only point worthy of note is that traumatism was not an alleged or exciting cause in a single instance.

Symptoms.—The disease usually develops in a most insidious way, although it may come on with considerable abruptness. The first complaint may be of profound and unattributable weariness, usually of one upper extremity. This may or may not be associated with trembling of the extremity, but the latter is sure to follow. With the feeling of

weight, fatigue, and unwieldiness of the extremity, a peculiar form of muscular rigidity develops. This rigidity is more apparent to the patient than it is to the physician on passive movement. Although this rigidity develops first in one extremity, it soon passes insidiously to the others, and eventually is manifest in every part of the body. It is responsible for the peculiar, immobile, expressionless countenance of the patient's face, for the bowed condition of his body, and for the slight flexion in all the articulations of the long bone. Moreover, the contraction which is at the bottom of the spasticity conditions the patient's gait, with its short, shuffling steps and tendency to run, called festination; inclination to fall forward (propulsion), as well as the tendency to fall backward (retropulsion), especially if the patient starts to move in that direction, and the inclination to fall sidewise (lateropulsion). It is responsible likewise for the high-pitched, unmodulated, monotonous vocalization and the fixed manner of speech. The tremor, which is considered an essential feature of the disease, may never develop; but usually it shows itself a few weeks or months after the rigidity and fatigue in one hand, oftenest in the left. Occasionally it precedes the occurrence of rigidity of the muscles. It gradually creeps up to the shoulder, accompanied by a peculiar subjective sensation of unrest, and passes across to manifest itself in the upper extremity of the opposite side. Later it shows itself in the lower extremities, and finally, as a rule (although this is contrary to the usual statement), in the cephalic extremity. It has three characteristics: First, its location, usually in the hands, which are already brought into a pencil-holding position by the muscular rigidity. It oftentimes causes a forward and backward movement of the thumb and the index finger comparable to those of rolling a pill, often called a pill-rolling movement. Second, its rapidity, from five to six a second, therefore standing midway between the slow tremors and the rapid or fine tremors. Third, it continues while the patient and his extremities are supported and at rest. Although it usually lessens in intensity when the patient attempts and performs voluntary movement, it oftentimes does not do so, and may indeed become slightly exaggerated. Occasionally it stops without apparent cause, but reappears without attributable exciting factors. It is increased by all forms of psychical excitation and by physical indulgence. It may involve all the extremities, and usually does so before the patient passes into the terminal stage, wherein the rigidity and immobility again have sway, as they often do in the beginning. In addition to these symptoms, which are looked upon as the leading features, there are many associated phenomena, all of them apparently perversions of the sympathetic nervous system. There are subjective sensations of heat, accompanied by local flushings, especially of the face and chest, by local and general elevation of temperature; attacks of sialorrhœa, diarrhœa, and outbreaks of sweat, which may or may not coincide with the flushings just spoken of; with sluggishness of the pupils on exposure to light; and profound amyosthænia, both paroxysmal and continuous. The sensory sphere is usually entirely spared. The cutaneous and deep-seated reflexes are normal, unless the phenomena of the latter are prevented by the

rigidity. The bowels and the bladder preserve their function, save in the manifestation of hurried action of the sphincters, and the digestive organs remain in fairly good working order. The patient is non-emotional, and exhibits a degree of contentment which is strikingly at variance with that which one would expect to find in a normal man or woman who had been deprived of their capacity to enjoy life or earn their daily bread, and who have probably been apprised of the eventual outcome of their disease. Nevertheless there is no dementia; at least, not until the disease is nearly at its end. Aside from the subjective sensations of fatigue, oppressive warmth, fullness in the head, and difficulty of prehension and locomotion, the patient's most frequent complaint is of sleeplessness and inability to get refreshing rest.

The course of the disease is uniformly progressive. In this it is strikingly in contrast with a disease which tradition maintained, and some still teach is frequently mistaken for paralysis agitans—viz., disseminated insular sclerosis, which is almost invariably progressive and retrogressive. The disease lasts from five to thirty years. As a rule, the patients pass into a bedridden and aesthenic condition, which makes different parts of their body vulnerable to infections, such as tuberculosis and pneumonia, and they die from these or other intercurrent disease.

Despite the fact that the symptoms of paralysis agitans are very characteristic and constant in their occurrence, the early clinical features of the disease are really quite variable. For instance, the time that elapses between the occurrence of a symptom that will be sufficient to direct the physician's attention to the real nature of the disease and the recognition of the serious nature of the complaint by the patient, is very variable. This is well illustrated by a few examples. One man observed that the left index finger was tremulous when he walked in the street. Eight years later he complained of cramps in the calf and instep of the left foot. Six months later still there was very characteristic agitation of the entire left upper extremity; while in the course of two years from this time all the extremities were affected, and the patient was in an advanced stage of the disease. The facies, the attitude, the tendency to propulsion, the speech, the drooling, etc., were all most typical of Parkinson's disease. In this instance the time between the initial symptom and the occurrence of characteristic symptoms was extremely protracted. Another point worthy of note is that the tremulousness preceded the muscular rigidity, this formula being usually reversed. Another patient came to the clinic on account of peculiar sensations in the head—a fullness and feeling of distention. He also complained of heaviness and weakness of the extremities. The slight, rather jerky tremor which was noted in the right hand he made light of, as it did not bother him. The facies, speech, vasomotor disturbances, and slight rigidity of the extremities were sufficient to warrant the diagnosis. Twelve months later we saw him again, when he had typical tremor and rigidity of all four extremities. Another patient avers that the initial symptom was a tendency to stagger, as if he was drunk, which preceded by six months an agitation of the right hand

first noticed on writing. An interesting feature of this case was that he was one of the very few that showed any considerable mental depression. Another patient complained of stiffness in all the joints for upward of four years before any tremor showed itself. One woman assured us that the initial symptom in her case was pain in the right shoulder, which was followed in five months with pain in the right hand. Before the year was passed the right hand was tremulous in a characteristic fashion. Some time after that she complained of pain in the left shoulder, and later in the left hand. Then this extremity became tremulous. Thus the pain and tremor extended to involve the four extremities. Another woman said that she had had pain in the right thumb almost steadily for three years without any other symptom save a variable amount of acro-paræsthesia. At the end of this time tremor began in the index finger and thumb of the right hand, the movements being of the "pill-rolling" character. Another woman says that the initial symptom was inability to move around as agilely as formerly, especially in the morning. After this condition had lasted for a year or more she remarked a tremor in the right hand. Another woman states that the early symptoms in her case were referable entirely to the stomach, a sensation of fullness and agitation in the stomach, associated with flushings of the face and attacks of unaccountable perspiration. Two of the male patients stated that both hands began to shake simultaneously, and that this agitation was the initial symptom. In all the other cases the tremor was unilateral in its onset.

Recently,* Dr. Purves Stewart has described what he believes to be a new and early symptom in paralysis agitans. It consists in a peculiar affection of the toes, which causes them to become spontaneously strongly flexed and curled up under the sole in a cramplike fashion when the patient is walking. We have made careful inquiry and examination in ten of our twenty-four patients now under observation, and have found nothing approximating this, save perhaps in one case. In our experience it is neither an early symptom nor a symptom at all, except as cramps in various parts of the body are of occasional occurrence. Two of our patients complained of cramp in the foot, which, however, was as liable to occur while the patient was lying down as when moving about. Three patients suffered considerably from cramps in the legs. Considering, therefore, that involuntary, painful contractions of various muscles were noted in upward of twenty-five per cent. of the cases, it would seem more legitimate to call this a "new symptom in paralysis agitans" than "curling" of the toes.

Our statistics show that the type of the disease was preponderingly diplegic, which, it may be said in passing, is at variance with the statement of most writers, who say that the symptoms of the disease in most cases are hemiplegic in distribution. Thirteen of the cases were diplegic, three hemiplegic, and two tetraplegic. In three of the remaining cases

* *Lancet*, November 12, 1898.

the symptoms were more pronounced on the left side than on the right. This, however, does not place them in the hemiplegic category. Only two of the cases were of the monoplegic type. In one case the lower jaw was distinctly affected. Of the twenty-four cases one only was devoid of tremor. This was a most typical case of Parkinson's disease in a laborer sixty-one years of age. At the present writing his disease has lasted upward of five years, and there is no evidence of tremor. No general statement can be made concerning the earliest symptom in every case of paralysis agitans. As we have pointed out, this is variable with each case. Although tremulousness is the symptom for which the patient first seeks relief, careful inquiry will usually show that rigidity, amyosthenia, and diminished agility have antedated the tremor for a longer or shorter time.

Study of our cases relative to the nature and the rhythm of the tremor goes to corroborate the customary teaching. The rate was in all cases from three to six per second. The amplitude of the tremor increased with the progress of the disease. In three cases the tremor was distinctly intentional—that is, it was increased by purposeful movements. In some advanced stages it was noted that voluntary action had decidedly a quieting influence upon the tremor. In nearly every case the tremor was increased by excitement, reproof, mental agitation, etc. In two cases only was it noted that physical agitation had a soothing influence upon the tremor. Many German writers state that the head very rarely participates in the tremor, while Charcot taught that this was the exception, not the rule. This was inquired into in all of our cases, and in five there was distinct tremor of the cephalic extremity.

As to the influence of sleep, in nine cases of which definite information could be obtained, the tremor always stopped during sleep. One man was very positive that toward morning he was awakened by a spontaneous fit of shaking.

In eleven cases the state of muscular tonicity was measured with Dr. Musken's tonometer, some of them repeatedly. Without entering into details of this method here, it can be stated that in three cases of the hemiplegic type in which there was no tremor nor stiffness of the opposite leg, the tonometer showed a distinct increase of tonicity. In fact, in only two cases was there found normal tonicity of the legs. It may therefore be concluded that increased tonicity is a very early symptom, and probably always precedes the tremor and rigidity.

The respiration was studied in eleven cases. In four cases it was regular and deep, without particular change. In four cases it was superficial and of increased frequency, twenty-one to twenty-four a minute. In three of these last cases the expiration was irregular and jerky, while the inspiration was regular and harmonious. In one case it was distinctly noted that the jerkiness of the expiration coincided with the tremulous movement of the arm, but in the other two cases this was not so.

In fifteen cases special inquiry was made concerning the existence of propulsion, retropulsion, and lateropulsion. In seven case all knowledge of its existence was absolutely denied. In five of the remaining eight cases the patients complained of a tendency to fall forward. In four patients there was at the same time some retropulsion and lateropulsion. In two patients of the hemiplegic type lateropulsion was present, the tendency being to fall toward the diseased side.

In sixteen cases inquiry was made concerning the state of the stomach and bowels. Eight patients complained of obstinate constipation, one patient had chronic diarrhœa, another had occasional attacks of diarrhœa, while the remaining seven made no complaint of their gastro-intestinal functions.

Abnormal heat sensations were complained of in five cases out of fifteen, in which it was noted that inquiry had been made in regard to this condition. The hot flashes were usually of the face, but not infrequently also manifest in the side showing the tremor. In four cases perspiration was a very disagreeable symptom. As a rule, it occurred rather late in the disease. In one instance alone was it an initial symptom. Drooling was a very distressing symptom in two cases.

The mental condition of the patients were noted in nineteen cases. Eleven were cheerful, hopeful, and of good disposition, and easy to get along with. This, taken in connection with the fact that some of them were inmates of a charity hospital whose invironment is not particularly contributable to the mildest degree of euphoria, means a great deal. In none of our patients was there any perceptible degree of dementia Four of the patients were at times considerably depressed; but of these, one was trying to carry on a business, and another was subject to considerable harassment in a law court.

TREATMENT.—Unfortunately, no medicament has yet been discovered that has any influence in shaping the course or changing the outcome of this disease. Beginners in the art of therapy should keep this in mind, and thus spare themselves the trouble of attempting a cure by any of the drugs—and their name is legion—that have been recommended during the last half century. Energy of this kind and zeal for experimentation may be legitimately expended, perhaps, in trials with new drugs and other health-restoring measures. But it should not be forgotten that one is not always justified in elevating the hopes of the patient for recovery so high or so often that when the promises are not fulfilled their confidence is so completely shattered that only harm results. Despite this depressing estimate of the value of drug medication in the treatment of paralysis agitans, much can be done to alleviate the symptoms, to prolong the patient's life, and to make him more comfortable. As in all other nervous diseases, the dietetic and disciplinary treatment are of the greatest importance. Their value is very conspicuously seen in patients who early in the course of the disease are obliged to seek the shelter of a hospital. Although they are apparently and really not very ill, as wage earners they are incapacitated. The regular mode of life, and all that is

implied by hospitalization, is conducive to avoidance of wear and tear, and such patients continue year after year without any material change except slight increase of rigidity, tremor, and other cardinal symptoms. The first indication, then, is for the arrangement of an uneventful life, free from care, strife excitement, and sordidity, in a congenial environment and healthful climate. As a rule, a cool climate is for more grateful than a hot one. Residence in the country or in the suburbs, where a maximum of fresh air, sunlight, and sleep are to be had, with a minimum of demand on the mind and the body, meets the requirements, providing the vital force of the patient is not put to a severe test in withstanding extremes of temperature.

The diet should be of a simple, nourishing, strengthening kind, and close attention must be given to the functions of digestion and of absorption, so that the bodily weight may be kept at the level which was normal in health. The comfort of the patient can be materially added to by regulation of the bowels and other eliminative avenues. It is absolutely necessary that the patient has the personal care of an attendant or one of the family. Disastrous accidents have not infrequently followed neglect of this precaution. The customary measures for the maintenance of general muscular tone and nutrition, so serviceable in many functional and organic nervous diseases, such as the application of water and electricity. the use of massage and gymnastics, are not so appropriate in this disease as they are in many others. Nevertheless, the use of lukewarm baths, of from twenty-minutes to half an hour's duration, are oftentimes very soothing to the patient, and have a tendency to make the muscular rigidity less dominant. Moreover, they contribute to a moderate feeling of well-being, and assist toward the realization of refreshing rest for which the patient generally clamors In patients under forty years of age, the application of water from 90° to 75° F. from the hand of an attendant, followed and accompanied by friction, is sometimes serviceable in combating the distressing attacks of local and general heat of which the patient complains. This measure can be utilized daily with patients who react well after it. Reaction may be facilitated by having the patient wrapped in a hot blanket previous to the ablution, by having him stand in hot water during the bath, and by light massage and external heat following it. Massage, applied as stroking and light kneading, fulfills practically the same purpose and is utilized for the same ends. Papotement or percussion should be avoided. It tends to lessen the spasticity, to improve the general nutrition, and to increase the patient's capacity for rest. Swedish gymnastics have been warmly recommended by some writers, but we have never seen anything but detriment attend its use. The same may be said of suspension, which has been plentifully tried, and of nerve stretching. They are mentioned only to be advised against. A few years ago Charcot promulgated the fact that many of his patients with paralysis agitans were more comfortable after a short ride in a jolting vehicle. Assuming that the jarring and vibrations had a soothing effect on the nerve centres from which arise the tremor and

rigidity, this clinician had a chair so constructed that the patient or an attendant could, by pushing a pair of upright handles backward and forward, communicate vibration to the entire body. Such a chair was in use for many months in my clinic, but nowadays it subserves only a single purpose, a seat. Its uselessness is no greater than that of other vibratory apparatuses, such as the one for the head, that have been constructed with a similar end in view. Electricity has practically no place in the therapeutics of paralysis agitans, excepting so far as it is a potent agency for suggestion. One of the most striking results of treatment in paralysis agitans is the temporary amelioration of all the symptoms on undertaking any new form of treatment. We have now under observation a man in the advanced stage of the disease who some years ago maintained that he was materially improved by some mechanical treatment given to him by another physician. On inquiry, it was found that the "treatment" consisted in taking a few tracings of the tremor. Oppenheim states that he has seen considerable benefit follow thee lectric bath, and especially the application of the dipolar faradaic current, but it is not improbable that the bath alone would have been accompanied by quite as much improvement.

The drugs that are in use for paralysis agitans, and from which some benent in dissipating symptoms and fulfilling pointed indications may be expected, are hyoscyamus and duboisine, Indian hemp, opium, hæmatogenous agencies, such as arsenic and iron, and occasionally gelsemium and veratrum viride. Of these, the most important by far are the two first mentioned. Given hypodermically, which is the preferable way when possible, or by the mouth, they promptly mitigate the severity of the tremor, and have a pronounced tendency to relax the muscular rigidity. They are both powerful toxic agencies, and must therefore be given with care. Hyoscaymus (hyoscine hydrobromide, one one hundred and twentieth to one eightieth of a grain) is said to have more advocates than duboisine, but, personally, we much prefer the latter. In administration it is not so apt to be attended by disagreeable symptoms, while the effects are coequal. The sulphate of duboisine should be given in from one one hundredth to one sixtieth of a grain, two or three times daily. On the accession of vertigo, cephalic paræsthesia, disturbances of vision, nausea, dryness of the mouth and tongue, it should be stopped at once. In many instances the administration of either of these drugs is followed by almost complete cessation of the tremor for a shorter or longer time, but usually for several days. Unfortunately, thay apparently have slight effect in mitigating sleeplessness, amyosthenia, and the feeling of unrepose that so many patients complain of. When these become too burdensome for the patient to bear unaided, opium or its alkaloids, preferably morphine, must be given, and especially to cause rest and sleep in advanced cases. Earlier in the disease reliance can be placed on the less baneful sleep producers, such as sulphonal, trional, paraldehyde, etc., given in the same way as they are for idiopathic insomnia. The salts of salicylic acid, particularly those of sodium and potassium, have been widely recommended,

especially during the last ten years, probably suggested by the patient's complaint of rheumatic pains and by the occurrence of other more characteristic phenomena of rheumatism. After thorough trials, we are convinced that such medication is quite useless. Considering the profound degree of depression in neuromusclar tone which patients with this disease have, it seems incredible that the bromides have ever been recommended or given, but, unfortunately, they have been. They are powerful agencies for harm, and the thought of their administration should never be harbored. In some instances, especially in those cases that are not benefited temporarily by duboisine or hyoscyamus, same mitigation of the tremor and rigidity may be obtained by the administration of gelsemium or veratrum viride in from three to five-drachm doses, three times a day. These drugs have served us more satisfactorily as symptom medicines than Indian hemp, which has the recommendation of Gowers, and which has been widely used.—*New York Medical Journal.*

A NEW METHOD OF ANÆSTHESIA.

The manifest disadvantages of ether and chloroform at times, and the marked limitations to the use of local anæsthetics, have caused no end of anxiety to the surgeon when confronted by unusual conditions. That a way of relief has been ingeniously contrived would seem to be found in the device recently advocated by Bier, of Kiel, in the *Deutsche Zeitschrift für Chirurgie*, April, 1899. He adopts Quincke's method of lumbar puncture after preliminary local anæsthesia by Schleich's infiltration, and injects into the sac of the spinal cord small quantities of a dilute solution of cocaine, using from one-tenth to one-sixth of a grain. This seems to influence the spinal ganglia and the root zones and the medullated fibres before they emerge from the cord, and produces a complete analgesia below the line of injection, which comes on from eight to ten minutes after the injection. By using this method he has been enabled to do major operations without pain, and yet the patient does not lose the sensations of touch and of temperature Osteoplastic operations on the knee and ankle and hip joint, resection of the femur, necrotomy of the tibia and resection for osteomyelitis of the femur were performed without pain and with entirely satisfactory results. The author has experimented upon himself and a colleague, and reports that thus far the only untoward results obtained have been those due to a loss of the cerebrospinal fluid. This happened in his own case by self-experimentation, and he was confined to bed for some days, suffering from dizziness, headache, nausea and vomiting when he attempted to assume the upright posture. Since the experiments along the line of lumbar puncture have been so numerous it is by no means improbable that a method can be devised to overcome this disadvantage, and the device after further experimentation and perfecting will undoubtedly open up new fields in surgery.—*Medical Record.*

GASTRITIS CHRONIC.

DIAGNOSIS.—C. D. Aaron states that chronic catarrh of the stomach cannot be diagnosed from the symptoms given by the patient. The only positive means of diagnosis is the examination of the stomach-contents after a test-breakfast. The patient should eat as his first morning meal a dry roll and drink 12 ounces of water with it. Precisely one hour thereafter, this is removed and a chemical, microscopical, and physiological examination made of it If hydrochloric acid be present up to 40 degrees one must exclude catarrh. If absent, in 99 per cent. of cases there is a chronic catarrh; whether it be primary or secondary must be determined by an examination of the other organs of the patient.

Besides the search for free hydrochloric acid, it is of the greatest importance, diagnostically and prognostically, to show the presence of the ferments: pepsin and rennet. The residue of the test-breakfast is filtered and a reagent glass filled with 5 cubic centimetres of gastric juice and one drop of official hydrochloric acid. To this is added a thin disk of the white of a hard-boiled egg. In another reagent glass are placed 5 cubic centimetres of a 1-per-cent, solution of calcium chloride, and added to this three drops of gastric juice. Both reagent glasses are then placed in an incubator at 100° F. If the milk be coagulated in fifteen minutes and the disk dissolved in four to six hours, both ferments are present and atrophic catarrh of the stomach is to be excluded.

ETIOLOGY.—Etiologically the same author recognizes two forms of chronic catarrh: the primary and secondary. The primary, or true, chronic catarrh is caused by injury to the stomach directly, especially by excessive use of alcohol, tobacco, and laxatives; by insufficiently masticated food; by irregular mode of living, and by an obstinate acute catarrh. The secondary is to be found in engorgement of the systemic circulation or the portal system, and is usually due to chronic heart and pumonary diseases, cirrhosis of the liver, nephritis, infectious diseases, and occurs as an attending phenomenon in carcinoma of the stomach.

TREATMENT.—W. C. Bilbro remarks that each case should be especially individualized and studied and traced, as there are no two alike and no two require the same diet or medicine. There is absolutely no routine treatment successful. The successful treatment of chronic gastritis depends very much on the patient's resolution and perseverance in carrying out the instructions he receives. Mental influences are very important in the treatment. Arsenic in small doses long continued is one of the most potent drugs in any mucoid inflammation of the stomach and bowels. Nux vomica is indicated and should be given in doses of not less than 20 drops of the tincture, or from $\frac{1}{20}$ to $\frac{1}{16}$ grain of strychnine. Hydrochloric acid is almost always admissible and useful. Lavage is an important factor in the treatment. The object is to thoroughly clean the stomach, and nothing is better than papoid and water, the patient not being allowed to take nourishment for thirty minutes or an hour after

the washing. Diet must be strictly regulated; all irritating or indigestible food must be strictly prohibited, and only that which is most easily digested and assimilated allowed. Milk does not agree with every person, especially sweet milk, but when it can be taken alone or diluted with one-fourth lime-water, given in small quantities and at frequent intervals in extreme cases, it will be found very valuable. Tea and coffee, as a rule, should be avoided; alcoholic stimulants should not be allowed unless in cases of habitual drinkers, then a little good whisky in Vichy water is possibly admissible. Regularity in the times of administration and in the quantity of nourishment given is most essential.

Eugene R. Morris says the first thing in treatment is to carefully regulate the quantity and character of food, which should be taken regularly, and should be thoroughly masticated, starchy, fatty, saccharin, and all highly-seasoned foods and stimulants being avoided. Fresh air and exercise short of exposure and fatigue are essential. Cold sponge-baths, followed by brisk rubbing, improve the peripheral circulation and increase the tonicity of the skin. Pleasant surroundings and a change of climate and associations are beneficial where the tendency is to mental despondency. Hydrochloric acid is the most important and the most generally deficient ingredient of the gastric juice. It is not only necessary for its action as an acid, but is essential to the conversion of pepsinogen into pepsin. Ewald recommends large doses of the dilute acid—90 drops—after meals, while Leube and Reigel advise small doses, 10 to 20 drops. Probably the best results are obtained from the judicious use of hydrochloric acid in the atrophic and neurotic forms, while the bitter tonics act most effectually in other cases of chronic gastritis. Of the bitter tonics, strychnia, in some form, will prove the most satisfactory. Alcohol and sodium chloride prove good stomachics when properly used. Stomach lavage should be used more extensively. Lukewarm water may be used, but, if there is much thick mucus, a 1-per cent. salt solution, or 3-per cent. solution of bicarbonate of soda is preferable. With fermentation a 3 per cent. boric acid solution is to be used. Lavage should be performed, if possible, in the morning on an empty stomach, except when there is a nocturnal disturbance with flatulency, when it should be practiced three or four hours after the last meal. Lavage may be repeated once a day, unless the patient be delicate, when every second or third day will be often enough. It should be continued until the fluid returns clear. If the patient will not submit to lavage, the next best thing is to order one-half to one pint of *hot water* to be taken slowly one hour *before* meals.

S. W. Battle believes that hydrastis is one of the best remedies for catarrhs of the mucous membranes and for that of the alimentary tract especially. Fluid extract of hydrastis given before meals in doses ½ to 1 teaspoonful has given excellent results. Peroxide of hydrogen has also been found useful. A teaspoonful of peroxide of hydrogen and hydrastis may be given a half hour before breakfast in warm water.

PLEURISY.

SYMPTOMS.—Maurice Lemoine states that very often pleurisy with a large amount of effusion may be completely latent in an old person. Four varieties may be described: The first occurs in subjects who are apparently healthy. There may be merely some malaise, headache, and sleeplessness. Pyrexia may be completely absent or only very slight. There is very little, if any, dyspnœa, and there may be merely slight pain in one side of the chest. The existence of effusion becomes evident by examination.

The second form occurs in persons of somewhat impaired health. Respiration is accompanied by some difficulty, and there may be nocturnal dyspnœa and breathlessness on exertion. Perimalleolar œdema is sometimes noticed. A sudden attack of cardiac failure follows these symptoms.

The third form is more marked; there is dilatation, anasarca, Cheyne-Stakes respiration, and intense dyspnœa. Pleural effusion is a late symptom.

In the fourth variety the cause of pleurisy is pulmonary infarction, and the symptoms in this condition may be observed previous to the appearance of the pleurisy, which only occurs toward the end of the second week.

Tuberculosis and pneumonic pleurisy may also be found among elderly patients, but do not differ in their symptomatology from cases occurring earlier in life. Sudden death in the course of a pleurisy is very rare among old people.

G. Zuelzer states that, according to Bouveret, the general symptoms of diaphragmatic pleurisy are like those of pleurisy elsewhere, but physical signs are absent. The pain is more severe and more widely distributed than in ordinary pleurisy. Palpation discovers tender points around the thorax at the level of the insertion of the diaphragm; at the base of the neck, where the phrenic nerve passes along the scalene muscles; and at a spot which represents the point of intersection of two lines, one running vertically, parallel with the outer sternal border, the other, a horizontal one, being an imaginary prolonged tenth rib. Other peculiarities of this variety of pleurisy are: 1. The pain is abnormally violent and diffuse. 2. Movement is almost suppressed in the hypochondrium and base of the thorax on the affected side. 3. Physical signs may be absent, or consist in a limited tympanitic resonance at the extreme base, and minus breath-sounds. 4. Occasionally there is pain on swallowing as the food passes the diaphragm. 5. Hiccough may be present. These effusions, when near the centre of the diaphragm, are out of reach of the exploring syringe.

TREATMENT.—Lop and Monteux from a study of various reports of staphylococcic pleurisy, find that the condition is of extremely low, irregular, and prolonged cause. The fluid is often serous in the early stages, subsequently becoming purulent; but it does not contain flakes

of fibrin. Suppuration is usually free. The staphylococcus is not very specific and only tends to develop in those who are already in bad health or who are convalescing from some serious illness. The diagnosis from tuberculosis is often difficult.

ETIOLOGY.—Lauder Brunton remarks that one of the first causes of pleurisy may be injury to the side, a blow, etc. In many other cases a chill gives rise to the pleurisy, and in some of those cases it is impossible to trace the presence of any other factor.

Leaving out cancer of the pleura, le Demany groups all sero-fibrinous pleurisies in three classes :—

1. Tuberculosis pleurisy of the type known as acute, primary, or *à frigore.*

2. Pleurisy from miliary tubercles of the pleura in the course of a general tuberculosis.

3. Pleurisy secondary to lesions of the lung; (*a*) by subpleural infarcts; (*b*) by subpleural hepatization; (*c*) by pulmonary congestions.

Pyogenic microbes, if they set up any pleurisy, can only cause a purulent pleurisy. Sero-fibrinous pleurisies and purulent pleurisies are the results of processes essentially different, and not merely two distinct degrees of the same process. All sero-fibrinous pleurisies being regarded as tubercular, it is preferable to leave the effusion until the pleural tuberculosis becomes healed. As tubercle develops less easily in a collapsed lung than in a normal lung, the effusion is protective to the lung. Paracentesis is harmful in sero-fibrinous pleurisies, except to aid absorption which has already commenced, in which case it is harmless, but unnecessary.

Achard notes two cases of pleuritis occuring in the course of typhoid fever in which the typhoid bacillus was obtained in pure culture from the aspirated fluid. The fluid was serous in one case, and sero-sanguinolent, becoming purulent later, in the other.

PATHOLOGY.—W. S. Lazarus-Barlow has found that there are at least three distinct forms of pleurisy: (1) a form in which "fibrinoid degeneration" occurs along with marked filtration of the pleura by cells; (2) a form in which there is a general increase of the connective tissue of the pleura without marked filtration by cells and without "fibrinoid degeneration" of the connective-tissue fibrils; (3) a form in which the whole thickness of the inflamed pleura consists of highly-vascular and very young cicatrical tissue. Endothelium may be found covering the "false membrane," and the connective tissue of the pleura itself may undergo the change termed "fibrinoid degeneration"; but these changes are not commonly seen. In the greater number of human cases examined all trace of the normal endothelium was lost.

TREATMENT.—J. M. Patton regards the treatment of fibrinous pleurisy as largely symptomatic. The most efficient remedy for the plan is $\frac{1}{4}$ grain of morphine hypodermically. In diaphragmatic pleurisy morphine

is generally a necessity. Next to morphine the quickest relief is afforded by a good-sized fly-blister. When these means are objectionable, especially in children, the hot poultice, mustard plaster, or hot applications are very useful. Blisters, while relieving pain, seem, also, to have some modifying action on the intensity of the inflammatory process, and their application is, therefore, good treatment in cases of active inflammation. A single blister 4 x 5 or 5 x 6 is better than several, or a succession of, small ones. Leeches are better than cupping for the relief of pain. Fixing the side by means of long strips of adhesive plaster passing over the median line and drawn tightly gives much relief. The fever and cough should be treated symptomatically. The bowels should be managed by a little calomel followed by a saline. Iron, quinine, and strychnine are very useful in overcoming the depression which follows the attack.

Jegorof says that salol in doses of 12 to 42 grammes is of great service in cases of pleurisy, increasing the diuresis and promoting the absorption of effusion without producing any of the ill effects previously observed from alkaline salicylates.

In eleven cases of serious pleurisy Prosorowski was enabled to cause the disappearance of the exudations by painting the skin with guaiacol. No unpleasant objective by-effects were noted. As a rule, from five to seven applications sufficed to bring about the disappearance of the exudation. In a few cases a fall of 0.36° to 3.6° F. in temperature was observed after the application of the guaiacol, but a rise to the original or even a higher temperature soon followed.

Talamon thinks that a serious pleurisy which has not been tapped is recovered from better and more completely than one which is tapped. Even at the end of two months or more after paracentesis, sometimes dullness, diminished vocal resonance, and feeble respiration persist. Most of the cases of serious pleurisy are tubercular, and it is thought that paracentesis withdraws from the organism a fluid which is its principal defence against the invasion of the bacillus. It favors the absorption of the residue of this liquid, and together with this the germs which it contains. In this way it hastens the tuberculization of the lung.—*Monthly Cyclopedia.*

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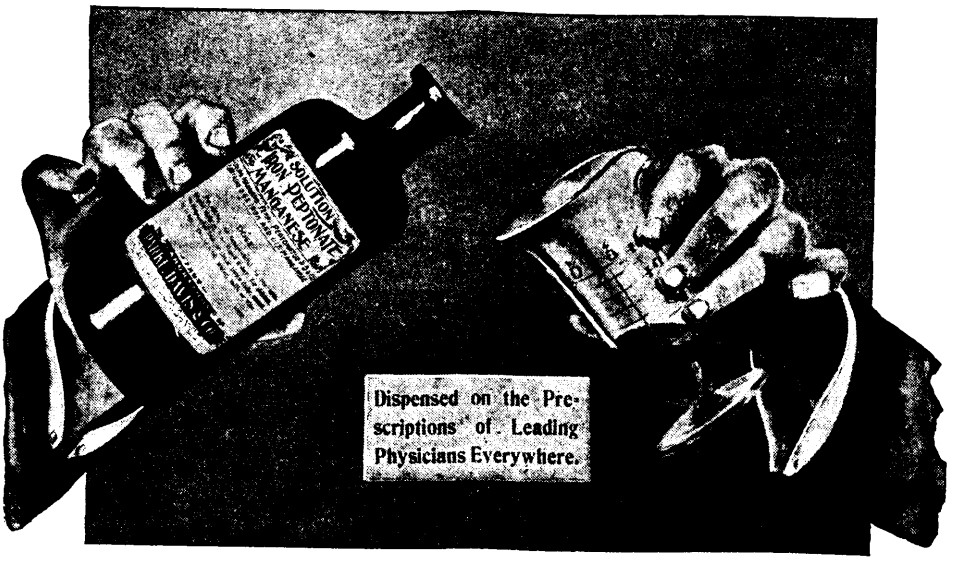

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CANADIAN MEDICAL ASSOCIATION.

The thirty-second annual meeting of the Canadian Medical Association will be held at Toronto on Wednesday, Thursday and Friday, August 30th, 31st and September 1st, 1899.

Through the kindness of the Honorable Minister of Education for Ontario, the building of the Education Department has been placed at the disposal of the Association, and in it the meeting will be held. This building is most centrally situated, as the Church street cars pass the building, and the Yonge street line is but one block away.

The programme will be of exceptional interest, and the very important subject of Inter-Provincial Registration will receive full discussion at this meeting.

A number of entertainments have been provided for, including a Reception and Musicale for members and their friends on the first evening; a Lunch at Exhibition Park; an Afternoon Tea at the Royal Canadian Yacht Club on the Island; a Smoking Concert, and other entertainments.

There will be an exhibition of instruments, drugs and physicians' supplies in connection with the meeting.

The Committee of Arrangements is making every possible effort to insure a successful meeting, and trusts that there will be a very large attendance. As the meeting is held during the first week of the Industrial Exposition, railway tickets to Toronto and return may be obtained for a single fare. We earnestly urge upon the members of the profession, to a man, to turn out to this meeting and make the thirty-second annual gathering by a long way the biggest on record.

PROGRAMME.

The President's Address will be delivered on the afternoon or evening of the first day by Irving H. Cameron.

The address in Surgery will be given by W. B. Coley, of New York

In the Skin Clinic, G. Chambers and A. McPhedran, of Toronto, and A. R. Robinson, of New York, and others will take part.

The following is a partial list of the papers to be read :

"The best method of dealing with the consumptive poor." E. J. Barrick, Toronto.

"Floating kidney simulating disease of the ovaries and tubes." A. Lapthorn Smith, Montreal.

"Observations on adenoids and enlarged tonsils and their removal, with notes of eighty cases in private and hospital practice." D. J. Gibb Wishart, Toronto.

"The methods and ultimate results of operations for valgus." N. A. Halux Powell, Toronto.

"Report of a case of abdominal pregnancy." H. Meek, London.

"An experience in formaldehyde disinfection." F. Montizambert, Ottawa.

"An inquiry into the etiology of chronic Bright's disease." A. G. Nicholls, Montreal.

"Operations for extra-uterine gestation." H. H. Chown, Winnipeg.

"Tuberculosis in cattle and its prevention." J. George Adami, Montreal.

"The hospital room in each dwelling." W. J. Telfer, Montreal.

"The treatment of spina bifida." Geo. A. Bingham, Toronto.

"Complications and treatment of fractures of the skull." J. M. Elder, Montreal.

"Recurrent paralysis of the third nerve (Charcot's ophthalmoplegic migraine)." J. W. Sterling, Montreal.

"Tuberculosis and insurance." J. Hunter, Toronto.

"(*a*) Typhoid infection without intestinal lesion ; (*b*) Gastroptosis." A. McPhedran, Toronto.

"Some observations on the treatment of cancer." A. R. Robinson, New York.

"Gall-bladder surgery." J. F. W. Ross, Toronto.

"Typhoid epidemics I have met." Wyatt Johnston, Montreal.

"The treatment of cataract." R. A. Reeve, Toronto.

"Christian Science." J. H. Richardson, Toronto.

"Anesthesia by chloroform and ether." Wm. B. Jones, Rochester.

"Treatment of the acute digestive disorders of infancy." A. R. Gordon, Toronto.

"Rhinoliths." Hubert D. Hamilton, Montreal.

"Observations on the relations of the thyroid gland to the uterus." C. R. Dickson, Toronto.

"The question of operation on thyroid tumors." Geo. A. Peters, Toronto.

"A case of malignant disease of the gall-bladder, simulating hydronephrosis (feeding through the gall-bladder for three days)." F. N. G. Starr, Toronto.

"An original method for the direct estimation of proteid digestion in the stomach." A. L. Benedict, Buffalo.

"Nephro lithotomy." B. L. Riordan, Toronto.

"The mastoid operation in chronic middle ear disease." J. M. McCallum, Toronto.

"Ringworm in Toronto." Graham Chambers, Toronto.

"The Great Lakes as a health resort." E. H. Adams, Toronto.

"A case of subcutaneous emphysema." Frederick Fenton, Toronto.

Papers have also been promised by G. H. Burnham, Toronto, A. B. MacCallum and J. J. Mackenzie, of Toronto, and a number of others.

During the meeting, T. G. Roddick, of Montreal, will address the Association on the subject of "Dominion Registration."

The Pathological Museum, in charge of a committee with A. Primrose as chairman, will add much to the interest of the meeting. A great many specimens have been promised, among which are the following:

Lower half of rectum removed for cancer. A. L. Smith, Montreal.

Ectopic pregnancy. H. Meek, London.

Extra-uterine gestation, and others. H. H Chown, Winnipeg.

Rarer forms of aneurism. Hearts. Calculi. Disease and fractures of bone, and others. J. Geo. Adami, Montreal.

Cast of hand from a case of acromegaly. J. M. McCallum, Toronto.

Congenital atresia of small intestine. W. B. Jones, Rochester.

Eustrongylus gigas in kidney of mink. Formaldehyde preparations. Dry anatomical preparations. F. N. G. Starr, Toronto.

Obstruction of colon by large gall-stone. Superfœtation. abortion at 4th month, 2 sacs 4 months and 6 weeks. Elevated fracture of skull. Heart and aorta. Fusiform dilatation of latter due to syphilitic endarteritis. Carcinoma of prostate with terminal suppurative cystitis. Columnar-celled carcinoma of stomach. Diffuse infiltration from cardiac to pyloric orifices. Solid ovarian tumor (Filseo Myo-Sarcoma) twelve pounds, etc. W. T. Connell, Kingston.

Lung—Chronic tuberculosis, Acute miliary, Tubercular broncho-pneumonia, etc. *Female Generative Organs*—Adhesions of pelvic organs, Pyosalpinx, Cysts, Tumors, etc. *Bladder Urinary*—Prostatic changes, Sacculation, Calculi, etc. *Bladder Biliary*—Hydrops, Calculi, etc. *Kidney*—Cirrhotic changes, Cysts, Tumors, Hydronephrosis and Pyonephrosis, Calculi, Tuberculosis, Anomalies and faults. (*Esophagus*—Stricture, New growths. *Stomach*—Ulcer simple, Carcinoma. *Intestine*—Adeno-carcinoma, Colitis, Enteritis chronic, Typhoid changes, Tubercular ulcerations. *Appendices: Heart*—Anomalies and developmental faults, Pericarditis, Myocarditis, Myomalachia cordis, Endocarditis, Chronic valvular disease, New growths, Dilation and hypertrophy without valve lesion. *Blood Vessels*—Atheroma, Aneurisms, Ectases, Varicose veins. *Liver*—Abscess, Cirrhotic changes, Venous congestion, Amyloid, Syphilis, New Growths. W. Goldie, Toronto.

For further particulars address F. N. G. Starr, Biological Department, Toronto.

It has been found impossible to send a circular concerning the Canadian Medical Association to every practitioner in the Dominion, as the lists of addresses are imperfect. It is particularly requested that any reader of this journal who has not received a circular, and who takes any interest whatever in the advancement of professional and scientific progress, will send a card to the General Secretary, Dr. F. N. G. Starr, 471 College Street, Toronto, from whom he will receive all information.

THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.

The ninth annual meeting of the American Electro-therapeutic Association will be held in Washington D.C., on September 19th, 20th and 21st, 1899, under the presidency of Dr. F. B. Bishop, of Washington.

Quite a number of papers of great scientific value have been promised, and the Committee of Arrangements insures the members a very entertaining and pleasurable meeting. Aside from the sessions of the Association, the Committee has completed arrangements for a trip to Mt. Vernon, one to Arlington, and several other social features.

The headquarters of the Association will be at Willard's Hotel, where special rates will be given to members and their families during the meeting.

PERSONAL.

Dr. Davison, of Charles street, is spending a month on Georgian Bay fishing, etc.

Dr. Ernest Hall, late of Victoria, B.C., has located in Toronto at 602 Spadina avenue.

Upon Dr. W. B. Geikie's return from holidays, it is his intention to retire from active practice, and confine himself to consultation work and that of teaching. The long career both as a teacher and general practitioner, admirably fits him for the position of consultant and he no doubt will receive the hearty support of the Profession both in city and surrounding country.

THE USES OF REMEDIES IN DISEASES OF THE HEART AND BLOOD-VESSELS.

It is obvious that the scope of my paper is so large that if I were to deal with it fully I would require to write a text-book, so that I can not do more in the time at my disposal than simply enter upon a few of the most important points. I have, therefore, thought it advisable, instead of entering into the details which are usually to be found in ordinary handbooks on the practice of medicine or in special books on cardiac disease, to take up a few points which I regard as the most important and try, if possible, to bring out clearly the general principles of treatment in diseases of the heart and vessels.

It is curious to think that the heart which is beating in the bosom of everyone began to beat a considerable while before the body had assumed a human shape, and will, with very few exceptions, continue to beat a short time after the individual has forever become unconscious of this world and all its concerns. During the whole life of the individual his health, energy and activity, his success in life, his physical force, his mental power and even his moral qualities, all depend to a great extent on the way his heart performs its duty. Hardly less important than the action of the heart is the function of the vessels, because, even while the heart is beating regularly and steadily, obstruction to some of the cerebral vessels may transform a man who was far above his fellows in physical strength or intellectual power into a helpless paralytic or demented invalid. A study of the means by which the functional activity of the heart and vessels can be maintained or increased is, therefore, of the utmost practical importance. This has been recognized in every age of medicine, and perhaps there is no movement more characteristic of the physician than that of feeling of the pulse of the patient. By this simple act the trained finger can discover a great deal regarding the state of both the heart and the vessels, and gain much information regarding the indications for treatment. Greater perfection in other means of physical diagnosis, and especially in ausculation, have tended to draw attention away from the pulse and direct it rather to the sounds which can be heard in the heart and vessels, so that more thought is now bestowed by many physicians upon actual valvular changes than upon the strength of the cardiac muscle. A little consideration will show that this is wrong. Many men live with serious organic disease for many years and are hardly conscious of it. When I was a medical student, one of my honored teachers had had pericarditis and suffered from great shortness of breath due to adherent pericardium. After a lapse of thirty-five years, during which he has continued to do much good work, he seems now to be much stronger and healthier than he was then. A similar occurrence takes place when the valves are diseased. In his excellent work on diseases of the heart, Sansom says that many who are the subjects of even considerable valvular affections can live a large portion of their lives unconscious that they have any such disease. Balfour states that he has seen many

cases of aortic incompetency who have suffered from it from thirty-five to forty years, and an old friend of his had suffered from mitral regurgitation for nearly seventy years, yet lived a useful life nearly all that time, and even at the last, his heart was not the first organ to fail. A medical man whom I used to see had been rejected for life assurance on account of mitral disease, before the Crimean War, and had been told that he had not two years to live. He thought that as his time was short, he might as well see something of the world during it, so he entered the army, served through the Crimean War, saw a great deal of active service afterward, and died only about two or three years ago. These instances clearly show that considerable valvular disease may have little effect in shortening life or producing serious symptoms. But the case is very different when we come to consider the muscular walls of the heart, for any weakness in them not only enfeebles the circulation at once, but will secondarily produce valvular incompetence The mitral and tricuspid valves are only large enough to close orifices of a certain diameter, and when these orifices become larger, as they do from enfeeblement of the cardiac muscle, the valves are not able to close the auricular and ventricular openings, and regurgitation takes place.

Weakness of the heart is not an absolute, but only a relative term, and however strong the heart itself may be, the limit of its power may be reached. The ancient Greeks who carried the news of the battle of Marathon to Athens must have had a very powerful and healthy heart in order to do so, but even he overstrained it and fell dead at the conclusion of his task. The young American who performed a similar feat a few years ago showed himself either stronger or more fortunate than the hero of old, yet he must have felt the unpleasant symptoms of cardiac strain. These symptoms are known to almost every one, because in ordinary people who are out of training a short run to catch a railway train or streamer, more especially if a portmanteau or bag be carried, will bring on tightness and oppression across the chest, rapid, difficult and gasping breathing, giddiness and muscular weakness, so that the person may be unable to stand. In feeble or elderly men these symptoms may be associated with a sense of impending death, and death indeed may actually occur. In such cases we find that moderate exertion in persons who are healthy but otherwise out of training, produces symptoms similar to those which occur in men of exceptional health and training, like that of the athletes of Athens, after severe strain. But when the heart is feeble and fatty from imperfect nutrition, such as occurs from the chronic abuse of alcohol, or from atheromatous change in the coronary arteries, and especially when the heart thus degenerated has extra work thrown upon it by valvular disease, we find that slight movements, such as that of crossing the room, of getting up, or even of sitting up in bed, may bring on symptoms of cardiac distress similar to those which occur after a run to the train in middle-aged gentlemen, or after a run of many miles in athletes. What I have just said is, I think sufficient to prove the statement with which I started, namely, that cardiac weakness is a relative term, and expresses the power of the heart, not absolutely, but only in

relation to the work that it is called upon to perform. Probably there is not one in a hundred thousand; perhaps indeed not one in several millions of men, however young, strong or athletic, who could at a moment's notice start on a race such as that from Marathon to Athens and run it successfully. In order to do so previous training is necessary, and the science of such training is to accustom the heart to excessive exertion by gradually increasing the work which it has to do, while at the same time the other organs of the body are kept in a healthy condition, so that the heart may receive a proper supply of healthy blood and its nutrition be thereby increased. The best example of training is the classic one of Milo, the wrestler of Croton, who is said to have succeeded in carrying a full-grown bull upon his shoulders by beginning to carry it when it was a new-born calf and continuing to carry it every day afterward. In this, way, it is said, the athlete's strength gradually increased in proportion to the weight of the calf. If training, then, be the method of bringing an ordinary healthy heart up to the mark required for excessive physical exertion, the same method ought to be successful in bringing the heart enfeebled by disease up to the healthy standard.

This, I believe, is the truth, and of all agents for remedying cardiac weakness there is none so good as that of training. The training must be adapted to the condition of the heart, and the amount of exercise given to a feeble, fatty heart must be very little indeed, and when even slight movements give rise to cardiac distress, we must insist upon absolute rest. It is sometimes difficult to get this injunction carried out, for active people insist upon getting up and moving about the room, even when such movements cause distress. But here the physician must insist that absolute rest in bed shall be maintained and that the whole strength of the patient shall be devoted to the recuperation of his heart. One good rule is that the heart shall not be allowed to make a single extra beat that can be avoided. If the patient rises in bed his heart will probably beat from five to ten times in a minute more than if he lay quiet, and if it does this for five minutes it has done from twenty-five to sixty beats too much. Sometimes patients will grumble, but they may occasionally be comforted by simply reminding them that their condition is not nearly so bad as if they had broken their thigh-bone, for then they would have been put up with a splint, unable to move for many weeks, and very likely have been suffering pain, while their cardiac disease is producing them no pain whatever. Indeed, I have sometimes threatened patients to put them up in a long splint, as if they had a broken leg, when I find them rebelling against the enforced rest which is necessary for their recovery. I do not think I can speak too strongly regarding the necessity for absolute rest in bed in cases of cardiac distress. I often remind patients that they must treat a strained heart as they would a sprained ankle, and remember that just as the least extra movement will bring on a pain in the ankle so it will increase the distress in the heart, while each increase still further prolongs the time necessary for recovery.

But here another difficulty meets us. By keeping the patient so quiet we no doubt lessen the work the heart has to do, but we diminish at the

same time the circulation through the stomach, liver, intestines, kidneys and musles, and we thus tend to a certain extent to interfere with the elaboration of healthy blood which is required for the efficient nourishment of the heart. Here massage comes in, and when this is skilfully applied, it not only increases the circulation through the various organs of the body, but while doing so it gives the heart rather less than more to do. For when the patient is left to himself the heart has to drive the blood onward through the whole circulation, but when the masseur is at work he moves the venous blood along the veins, the lymph along the lymph spaces and lympathics, so that his hand is really a kind of accessory venous and lymphatic heart. At the same time it actually lessens the work to be done in the muscular arteries, for Dr. Tunnicliffe and I found that massage of the muscles causes the blood to flow through them much more quickly than when they are at rest. We see, then, that in the worst cases of cardiac distress the chief remedies are absolute rest and massage. But there is a long interval between this condition and that of ordinary health, which must be filled up by gradually increasing movements. These movements have of late years received a great deal of attention, more especially from Ling in Sweden, Schott of Nauheim, and others. The essence of these movements is that they must be slow, gentle, and gradually increased against resistance, that they shall not cause the patient any distress, but only call upon the heart for such work day by day as it is well able to do. But before the patient has reached this stage where he is able to take ordinary exercise, another system of treatment, namely baths, may be employed to assist the action of the exercises. In the treatment which is so successfully employed at Nauheim the baths contain chlorid of sodium and calcium, the proportions being 10 per 1000 of chlorids of sodium at the commencement, gradually raised to 30, and of chlorid of calcium 2 per 1000, gradually raised to 3 or even 5 per 1000. At Nauheim the waters contain carbonic acid, but this may be artifically supplied by means of bicarbonate of sodium and hydrochloric acid, or tablets specially prepared for this purpose.

The effect of these baths is to stimulate the skin and increase the flow of blood through it, while at the same time a reflex influence is exerted upon the heart through the vagus, by which the pulse is slowed. It is evident, by dilating the cutaneous vessels, the effect of the bath upon the skin is somewhat similar to that of the masseur upon the muscles; that is, in both cases the bed through which the blood has to flow becomes wider, and the resistance to the action of the heart is consequently diminished. Where the tension is great it may be still further diminished by the use of nitrites or substances having a similar reaction. But the most important effect of the baths is probably a reflex one upon the heart, and perhaps I may make this effect more clear by a comparison with athletic feats. To walk a thousand miles in six weeks can hardly be regarded as any feat at all, but to walk a thousand miles in a thousand hours is a very different thing indeed, and may be regarded even now as beyond the capacity of most men. There is no

more actual work involved in walking twenty-four miles in one day than in walking twenty-four miles in twenty-four successive hours, one mile every hour. The difference between the two is the shortness of time allowed for rest and recovery between each period of exertion in the latter. When this time is further shortened, as it is in walking a thousand half-miles in a thousand half-hours, the difficulty becomes incomparably greater. It would probably be almost impossible for any one to perform this feat by walking a mile at the beginning of each half-hour, but in order to increase the intervals for rest, one mile is done at the end of one-half hour and the next mile at the beginning of the next. Supposing that a man walks four miles an hour, or what is equivalent to it, one mile in a quarter of an hour, he would only have a quarter of an hour's rest between each successive mile if he walked it at the beginning of each half-hour. But by walking two miles together he is able to obtain half an hour's rest, and it is the prolongation of the rest which enables the man to go through with the feat. Now, the action of the heart is like that of the athlete who has very short periods of rest between his periods of action, and just as the athlete's work is rendered more difficult by shortening his periods of rest, so is that of the heart by increasing the rapidity of its pulsations. For just as the athlete will take about the same time to cover his mile whether he be walking twenty-four miles a day, one mile in each hour, or half a mile in each half-hour, so the heart takes about the same time to perform its systole whether it be acting quickly or slowly. Increased rapidity of the pulsations, therefore, means a shorter time for rest and consequent loss of time for recuperation. The inhibitory fibers of the vagus, which slow the heart, are the nerves which tend to increase its nutrition, and when they are cut through and the heart is allowed to beat more quickly, it is very apt before long to undergo degeneration. It is, therefore, evident that any means by which we can stimulate the vagus and slow the heart is likely to aid us in restoring its power. This is the effect which baths seem to have, and they probably act, reflexly on the vagus through the nerves of the skin.

But we have, in addition, various drugs which stimulate the vagus roots in the medulla oblongata or the terminal endings in the heart itself. The number of these drugs is very great, and very many of the arrow poisons and ordeal poisons employed by savages act on the heart in this way.

Among them may be mentioned the active principles of digitalis, strophanthus, erythrophleum, convallaria, adonis vernalis, antiar, tanghinia, hellebore black and green, oleander squill, manganja, carravol, vao and cactus, but among these the most important are certainly digitalis and strophanthus. These drugs not only slow the heart, but they increase the energy with which it contracts. The energy may be still further increased by a combination of strychnin or nux vomica with the drugs already mentioned, for while they appear to act chiefly on the muscular fiber, strychnin exerts its stimulating action on the motor

ganglia of the heart. By the combined use, then, of rest, massage, graduated exercises, baths and cardiac tonics, the heart may be bronght from a condition of extreme weakness to one of moderate strength.

And then comes in the use of another system of training which is usually associated with the name of Oertel. The essence of this consists in gradually increasing the work that the heart has to do by making the patient walk farther and farther along paths of gradually increasing steepness, so that at the end of the treatment he will be able to walk a considerable distance and up a pretty steep incline. This treatment, however, requires careful supervision, lest at any time the patient overtax his strength, and the supervision should be exercised from day to day, because the health and strength of a man may vary very considerably in two successive days, not from any change in the heart itself, but from changes in other organs, and more especially in the digestive or eliminative organs. Attention to these is most essential in diseases both of the heart and vessels, but to enter fully upon this subject would take me too far, and I must conclude this paper, which I fear is already too long, by simply mentioning the great use of cholagogues, purgatives and alteratives, such as iodid of potassium, in diseases of the heart and vessels, more especially in antheroma, which, by affecting the coronary arteries, leads to disease of the heart itself. The utility of iodid of potassium is very great, but sometimes it must be administered in large doses, and frequently I believe the full advantage is not obtained because the doses are not sufficiently large.

To resume shortly what I have said in this paper, the main risk in cardiac disease is from feebleness of the muscular wall of the heart, and the chief remedy is to lessen the work to be done till it is not excessive even for the most feeble heart; to slow the heart's action so as to give it time for rest, and to train the heart by graduated exercises until it is able to meet all the ordinary, or perhaps all the extraordinary, demands upon it.

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HAY FEVER.

TREATMENT.—A. Rixa thinks that in the prevention of hay fever about two weeks before the onset of the disease one should commence to irrigate or sterilize the nasal cavity and the post-nasal spaces with a harmless antiseptic solution, using the douche and the atomizer. Hydrozone is the most innocuous and most powerful germicide. It is a 30-volume aqueous solution of peroxide of hydrogen. At the beginning it may be used for irrigation diluted in the proportion of 1 ounce of hydrozone to 12 ounces of sterilized water. Nearing the period of the expected onset of the disease the dose is increased to 2 or 3 ounces of hydrozone to 12 ounces of sterilized water, the douche, either tepid or cold, being used four times a day,—morning, noon, evening, and at bed-time,—while, during the intervals, the atomizer, with a solution of hydrozone and pure glycerin, or sterilized water, 1 to 3, is used. In most obstinate cases when there is still some irritation in the nasal cavity the following prescription may be used also:—

℞ Acid. boric., 20 grains.
Menthol., 4 grains.
Glycothymolin., 2 drachms.
Sol. eucaine B, 4 p. cent., 2 ounces.

M. Sig.: Use in atomizer. As a rule, this treatment is sufficient to avert the disease and keep the patient comfortable.

The mucous membrane may be rendered less sensitive, or non-sensitive, to "pollen" or other irritants, and it may be given greater resisting power and made immune against the exciting causes by a method that is termed by Edward W. Wright "massage treatment." This treatment came about in the following manner:—

In reviewing the chemistry of hypoxanthin the statement was found that it was present in the "pollen of flowers and grasses." By blowing powder of hypoxanthin into the noses of patients who had had hay fever it was attempted to excite the symptoms of that condition; but it could only be said to be an irritant. Then the powder was used to render the mucous membrane accustomed to it. Knowing the good effects of tannic acid in eyelid affections, and the beneficial results of iodine in the pharynx, it was decided to use one or both of these in the nose, applying it with gentle friction over the whole mucous membrane of the nose, but more especially to the usual sensitive areas. When there was a thickened condition of mucous membrane and an hypertrophy of parts beneath, iodine, potassium iodide, and glycerin were used. When the mucous membrane was thin, sensitive, with no appearance of hypertrophy, tannic acid, carbolic acid, and glycerin were applied. These, in weak solutions, were thoroughly applied with gentle friction to all the nooks, crannies, and surfaces of the interior of the nose, but more particularly over the usual sensitive areas, that part of the septum opposite the middle turbinated, and that part of the soft palate just behind the septum. Sometimes it was

necessary to use a very weak solution of cocaine in fine spray before a thorough massage could be accomplished The object of these applications and the friction by massage is to harden the mucous membrane, giving it greater resisting power, and thus immunity against "pollen" and other excitants.

For the treatment of an attack of hay fever two new drugs promise well: orthoform and suprarenal capsule. Orthoform will allay the supersensitiveness, the hyperæsthesia, and the paroxysmal sneezing. Its effects are in duration many times longer than cocaine, and it has no toxic action. When it is wished to give the patient free breathing through the nose, and lessen the serious discharge, the use of a solution of suprarenal capsule will accomplish the desired result without the disadvantages of cocaine.

B. Douglas advises treating the the attack by irrigation of the nasal passages with a saline solution at a temperature of 106° to 114° F., after previous spraying with a 1-per-cent. solution of cocaine; this to be followed by applying, for four minutes, to sensitive parts pledgets of cotton moistened with a 4-per-cent. solution of cocaine. After this, phenol-camphor or a 19-grain solution of silver nitrate may be used with advantage. After the acute symptoms subside a spray of benzoinal containing a little menthol is to be used. The extract of suprarenal gland is almost a specific in hay fever. It may be used in the form of a spray of the aqueous solution, or given internally in the form of compressed tablets. The tablets should be given at first every two hours until some prostration is noticed and then the intervals should be lengthened; but two doses daily should be taken throughout the hay-fever season. The vasomotor disturbances should be treated by daily cold sponging or spinal douches and the internal administration of small doses of quinine and digitalis.

RHEUMATISM.

ETIOLOGY.—Delcourt finds chronic, deforming, articular rheumatism uncommon during childhood. There are two stages of the affection: one, chronic arthritis with localization of the disease process to the synovial capsule and the periarticular tissues; the second results from the first, by the extension of the process to the cartilages of the bone. Heredity plays some rôle in the causation of the disease, its exciting factor being, however, rather defective nutrition. There exists a certain antagonism between scrofulous tuberculosis and this rheumatic affection: that is, they rarely occur together.

Frederick E. Batten examined 115 chronic children in order to determine what percentage subsequently developed rheumatism. Of these, 11.3 per cent. of the children without previous rheumatism developed rheumatism within 3 years. After 5 years this was increased to 20 per cent.

Robert B. Preble thinks that there is some relation between chorea and rheumatism, rheumatism being much more frequent in children suffering from chorea than in children in general. Rheumatism acts as an excitant to chorea by the selective action of toxins upon the motor cells of the cortex, functional affections being caused, but no structural changes.

TREATMENT.—H. G. Langwill suggests the following as a summary of the chief points in reference to the prophylaxis of rheumatic hyperpyrexia: 1. Cases in which the pyrexia shows a tendency to rise instead of decline under full doses of the salicyl compounds, and in which no intercurrent condition can be detected which might account for the increasing pyrexia, should be treated at once by cold applications without waiting for the onset of nervous symptoms or for other prodromata of rheumatic hyperpyrexia. 2. When delirium appears in a case which exhibits pyrexia, and no intercurrent visceral complication can be made out which might account for its presence, the immediate employment of cold is called for. 3. Should delirium appear while the temperature remains normal, a mild form of cold applications—*e.g.*, an ice-cap to the head—should be employed, and on the appearance of pyrexia more vigorous methods ought to be adapted without waiting for any extreme degree of pyrexia (*e.g.*, 105°) to be reached. 4. Cases in which the hyperpyrexia is, as it were, accidentally discovered to be present offer, of course, no field whatever for prophylaxis, but treatment by cold should be commenced at once without waiting for the appearance of nervous symptoms or attempting to reduce the temperature by means of any antipyretic drugs.

In articular rheumatism Wilms uses a simple apparatus personally designed for the continuous application of heat to joints. Flexible metal tubes are coiled several times around the joint, a thin layer of plaster of Paris being first applied to protect the skin. A constant stream of water, at 175° to 195° F., is maintained through the coil by syphon action. The water should be used as hot as it can be borne.

B. O. Kinnear remarks that in chronic articular rheumatism the regulation of the circulation of the blood throughout the body by means of cold applied over the spinal nerve-centres will, without the aid of internal medication, restore the patient to health or ameliorate his condition. The reason that cold over the spine will accomplish this result is because when properly and intelligently applied it will always dilate the arterioles and capillaries throughout the whole organism and increase the external heat of the body very perceptibly. This signifies more rapid metabolic changes, increased general nutrition, and restoration to normal function in the tissues. The ice-bags which are to be used should never be wider than four and a half inches for the adult, otherwise the body will be chilled. The length of the bag depends on the age and size of the patient. By the intelligent use of such applications it is possible rapidly to subdue inflammatory forms of skin disease, chronic forms of inflammation in the mucous membranes, such as chronic bronchitis or chronic diarrhœa, and also "irritable ulcer," as well as cold and sluggish ulcerations. Some eight thousand applications of cold over the spine have been personally made, with observation of the results. In all these forms of inflammation, as well as in chronic articular rheumatism, the spinal ice-bag is exceedingly grateful to the feelings of the patient. After a few weeks, or even a few days, he perceives a renewal of strength, particularly if he was originally strong and vigorous. In patients of naturally feeble constitution the results are longer in appearing.

One of the worst cases of chronic articular rheumatism personally ever seen was cured by the application of the spinal ice-bag alone, without the aid of drugs, after almost every known remedy had been tried. Nearly every joint in the patient's body was affected, and had been so for eighteen months previous to the treatment. The pain was constant, night and day, and he had become much emaciated.

A twenty-two-inch spinal ice-bag was applied from the fourth cervical to the third lumbar vertebra, for one hour twice a day, with immediate relief to pain, while the bag remained on. In ten days pain had ceased in all his joints, and he could rise from the sitting position at once, easily and comfortably. His progress toward recovery was steady and rapid, and he regained in a few months about forty pounds in weight. In six months' time the cure was complete, and from that day to the present (some twelve years) he has had no relapse.

The use of the spinal ice-bag is not advised in acute articular rheumatism, on account of the great shock to the system in the sudden checking of such wide-spread disorder, but, after the disease has run its course, the condition of the patient may be improved much more rapidly and the strength more speedily regained by the use of cold over the spinal nerve-centres than is possible without such treatment. In lumbago the dorso-lumbar spinal ice-bag (ten inches long, four and one-fourth inches wide) will readily break an acute attack, with almost immediate comfort to the patient. At the same time a fairly-strong cholagogue should be

administered. In chronic lumbago the ice-bag will effect a cure in many cases, and in others it will check the severity of the disease, and give much ease to the patient. In chronic articular rheumatism the spinal ice-bag may be used from one-half hour to three hours per day in divided application, according to the strength and general condition of the patient. If the appetite be good and the patient fairly strong, then the ice-bag, at first wrapped in one thickness of flannel, may be used morning, noon and night for an hour. The bowels must be kept moving steadily and naturally. In an acute attack of lumbago the whole intestinal tract should be evacuated by a cholagogic pill and a large enema, the dorso-lumbar ice-bag applied against the skin, and continuously, from the seventh or eighth dorsal to the third lumbar vertebra, until the patient is able to rise and be about with some degree of ease. The bag is then reapplied every four hours, for one-half hour at a time, until entire relief has been established. A mild tonic with some preparation of iron will then be sufficient to restore the patient to his usual health.

ACUTE RHEUMATISM.—*Treatment.*—H. B. Favill applies the following treatment to a typical case of acute rheumatism:—

1. The bowels are to be emptied thoroughly, preferably with a sharp mercurial. 2. Salicylate of soda is administered to its full analgesic effect; if it is not well borne by the stomach, give its equivalent—oil of wintergreen. If it is contra-indicated by cerebral conditions, antipyrine may be used or the coal-tar preparation best adapted. If these are contra-indicated, by condition of the heart or nervous system, opium is of value. At all events, the pain is to be controlled. 3. As the pain is controlled by such means, aided by local measures, particularly heat and immobilization, the salicylate element should be gradually removed and the system saturated with alkali, continued until the active process seems controlled. 4. Finally, while giving alkali, or after it, iron should be administered, providing the conditions of bowels and liver permit. 5. At all times, and incessantly, one should promote intestinal hygiene by mercurial, cholagogue or saline, with the conviction that, upon the processes here represented, the disease, its duration and complications largely depend. Impatience with the tediousness of the course, leading to ill-considered and pre-mature activity, must be avoided.

In articular rheumatism Bourget recommends the following ointment:—

℞ Salicylic acid, 45 grains.
Oil of turpentine, ¾ drachm.
Adeps lanæ, 5 drachms.
Lard, 5 drachms.

This is spread over the parts, and a dressing of absorbent cotton applied and covered with any impervious material.

S. Sterling employs an ointment of salicylic acid in rheumatic affections in the cases in which the salicylates cannot be borne by the stomach The ointment personally employed is as follows :—

℞ Salicylic acid,
Oil of turpentine,
Lanolin, of each ½ ounce.
Lard, 2 ounces.

This is applied to the affected joint and thickly covered with non-absorbent cotton (wadding), which is covered with gutta percha tissue and kept in place by a flannel bandage. After the superficial epidermis is destroyed the turpentine is left out from the above formula.

Arendt recommends ichthyol applications, according to one of the following formulas, in articular rheumatism :—

1. ℞ Ichthyol, 2½ drachms.
Distilled water, 2½ drachms.
Adeps lanæ, 1 ounce.

2. ℞ Ichthyol, 2½ drachms.
Extract of belladonna, 15 grains.
Adeps lanæ, 5 drachms.

3. ℞ Ichthyol, 2½ drachms.
Diluted alcohol, 2½ drachms.
Distilled water, 1¼ ounces.

MIGRAINE.

ETIOLOGY.—Frieser maintains that migraine is rarely a disease by itself, but is a symptom accompanying some other affection. Sometimes there is an hereditary predisposition. Migraine often complicates anæmia and various diseases of the female generative organs. It may also be due to ear or nasal disease, but one of the most frequent causes lies in dyspepsia, due to chronic gastric catarrh, dilatation of the stomach, etc. Overwork in school-children is an important etiological factor.

C. A. Herter thinks the typical migraine paroxysm seems to be almost always associated with nutritive disturbances, which should be considered as part of the migraine paroxysm There are many features in a typical attack of migraine indicating gastro-intestinal disturbance. The ingestion of food often causes nausea and vomiting. Usually after a severe migraine paroxysm the urine is increased in amount on the second and third days after headache. The uric acid is increased and the extractives also. In seven different patients the contents of the stomach were examined in the paroxysm. In these cases there had been evidences of complete arrest of gastric digestion. Not only the secretory, but the motor activity of the stomach was diminished or temporarily arrested. Although it may be safely assumed that there is a toxæmia present in severe attacks of migraine, we must admit our utter ignorance of this toxæmia.

William Hirsch says that the chief objection to the toxæmia theory of migraine is the occurrence of unilateral symptoms, and the fact that one side of the body alone is affected time and again.

L. Stieglitz does not accept the view that the toxins giving rise to migraine come from the alimentary canal. The periodical cases of migraine often vomit repeatedly, and yet the attack is unrelieved. There seems to be a very close connection between epilepsy and migraine.

Joseph Colins thinks there is a very close genetic connection between migraine and epilepsy.

COMPLICATIONS.—M. Brasch notes the case of a man who, in the course of two years, had had four attacks of migraine. In the last attack there occurred excretion of tears from the left eye. Then headache in the left frontal region, then swelling of the eyelids, and suddenly, while straining at stool, a hæmorrhage into the lids, with loss of vision of the left eye. Pain disappeared as soon as the hæmorrhage had taken place. In the course of eight days almost complete recovery had ensued. The question is discussed whether the migraine of itself is sufficient to determine the effusion of blood, and an investigatian of the literature shows that, although infrequent, migraine with hæmorrhage had occurred. In a case, such as this, the prognosis is always favorable as far as the immediate attack is concerned, but the liability to relapse is considerable.

TREATMENT.—According to C. A. Herter, the first step in the treatment of a migraine seizure should be the washing out of the stomach with water at a temperature of not less than 105° F. The effect of lavage is better

where the stomach contains food, but it should be employed in any case. Where the lavage is inconvenient the patient should drink hot water. After the stomach-wash the patient should be given a rapidly-acting cathartic, one of the best being a teaspoonful or dessertspoonful of Carlsbad salts. It is desirable to avoid severe purgation. The cathartic should be aided by a hot soap-and-water enema, and this should be given though there has been a recent stool. If this active treatment is begun within the first hour of the headache, it not only markedly relieves the pain, but often cuts short the paroxysm. Phenacetin in doses of 10 grains, repeated if necessary, is generally useful, but ammonol seems to be the best drug. Black coffee, without sugar, is often very efficacious, as is, also, citrate of caffeine. Where the face is regularly much flushed, ergot sometimes acts well.

Mary Putnam Jacobi tried washing out the stomach on a very severe case of migraine, and she was able in that way to arrest an attack which was unusually severe. In this case the stomach was entirely empty at the time of washing.

In the attack of migraine Frieser thinks washing out of the stomach is of value, and, if this cannot be done, large quantities of warm water should be taken. Menthol is the best remedy. Constipation and dyspeptic symptoms must be carefully treated by diet and otherwise. Benzacetin and trephinin, given in doses of ½ grain, are useful. Valerianate of menthol may be used in the intervals.

Methylene-blue has been successfully used in headaches by Tomson. The remedy is well worth a trial in all nervous headaches, neuralgias, migraine, and similiar conditions. Merck's methylene-blue is the only one that should be used, other brands containing chloride of zinc and arsenic. This is combined with nutmeg, each 1½ grains in gelatin capsules, one capsule being given two or three times a day.

Eshner has had excellent results in migraine from the administration of the fluid extracts of gelsemium and cannabis Indica. The dose is from 3 to 5 drops of each, given three times daily, until physiological action becomes apparent.

H. Handford believes that migraine is due to vasomotor spasm; therefore treatment should be directed to the relief of this spasm, and consist in application of warmth to the extremities and the ingestion of warm drinks; antipyrine, phenacetin, and the nitrites are also often useful.

Ewer describes an apparatus which, by slight, very rapid, and equal vibrations of the body, is able to cure within two or three minutes all nervous pain, especially migraine. The apparatus is operated by electricity, and consists of a small motor whose core revolves with great rapidity. This core at one end is bent a little from its centre, so that with each revolution it strikes a rubber knob, giving to it a little thrust. If this knob is held against the surface of the body the rapid revolution of the motor transmits to it a trembling, with the relief of pain.

M. Benedikt says that the electrical treatment of migraine is the best. Sodium iodide has a favorable action.

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Since sending you a list of papers I have received the following:

"Craniectomy for Micro-Cephalus," W. J. Wilson, Toronto.

"Curettage, its Use and Abuse," R. Ferguson, London.

"Notes on a case of Jacksonian Epilepsy, with operation," D. C. Meyers, Deer Park.

"Massage and the Relief of Eye-Strain in the treatment of Glaucoma," Geo. M. Gould, Philadelphia.

"Extreme Emaciation in Hysteria, with notes of a case," T. Beall, Winnipeg.

"Hydro-Therapeutics in the treatment of Disease in Children," A. D. Blockade, Montreal.

"The results already achieved at the Gravenhurst Sanatorium," J. H. Elliott, Gravenhurst.

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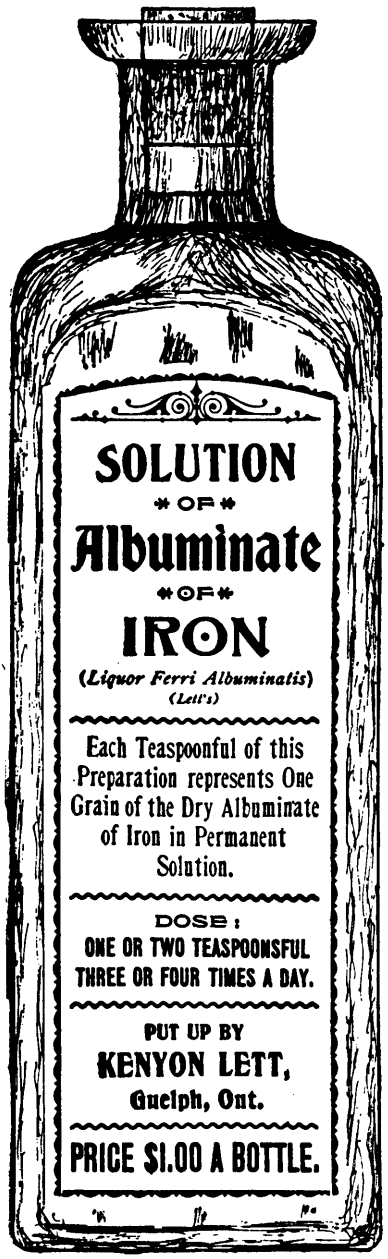

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