EYE-STRAIN AS A CAUSE OF DISEASES OF THE DIGESTIVE ORGANS.

GEORGE M. GOULD, M.D.
PHILADELPHIA.

Before the Section on Practice of Medicine of the American Medical Association,1 in 1905, the then president of the association, the professor of medicine in the medical department of an old university, read these words:

ONGASTRIC ORGANIC DISEASES PRESENTING GASTRIC SYMPTOMS.

The Eyes.—The subject is familiar to all. Who has not seen correction of errors of refraction relieve so-called “bilious attacks,” periodical vomiting, anorexia, indigestion and other gastric symptoms? The cure of grave organic ocular defects relieves similar gastric conditions.

A good-sized book, with no superfluous word, might be written concerning this astonishing admission, for: 1. Every statement made is true. 2. Every statement made is untrue. 3. Its significance is wholly unrecognized and far-reaching. 4. The history and due credit-giving are unjustly ignored.

1. Supposing that the thing intended to be said is really said, we have here an authoritative assent and reaffirmation of the truth that eye-strain frequently produces “bilious attacks,” periodical vomiting, anorexia, indigestion, and other gastric and intestinal diseases. It is now sixteen or seventeen years since I began to affirm and to reaffirm this truth, and this is the second convert made among the diagnosticians, leading practitioners or gastrologists. Hereafter I can merely refer critics, sneers, ignorers and deniers to Dr. Musser, ask them to settle their scores with him, and sing my “Nunc dimittis” with a smile of cheery satisfaction.

No longer is it a question of the opinion of a “specialist,” an “enthusiast,” an “exaggerator,” a “hobby-rider,” a “grinder of his own ax,” etc., but the president of the largest American medical society, the professor of medicine in a great medical college, and the leading diagnostician and practitioner in a large city, has spontaneously and publicly stamped the theory with the approving seal of his authority. There is abundant clinical evidence of the correctness of the intended statements of Dr. Musser in the paragraph quoted, and any practitioner can verify it in his practice by numerous patients whenever he will refer them to competent oculists and follow the histories up for a few days, a few weeks or a few months. In this instance it is not for the affirmer to prove his statement. Any man who makes such an assertion as this, and especially one occupying the position of authority and power held by Musser, is perfectly aware of the reach and significance of his published opinion. He has, beyond question, demonstrated it long and often, or he would not dare to come out so plainly and without equivocation. It, therefore, behooves the deniers, ignorers and cynics—the so-called “conservatives”—to prove their negation, because, by every moral and medical law, all patients continued in their sufferings by this “conservatism” may justly, and should legally, hold the deniers, ignorers and cynics criminally responsible. We hold the antivaccinationists accountable for every case of smallpox, and it is proverbially “a poor rule that will not work both ways.”

How many deaths are chargeable to the prejudices of Hodge and Meigs and their blind adherents who opposed the clear logic of Oliver Wendell Holmes? And when the error-loving and truth-hating opponents and rivals of Semmelweiss ruined him professionally and allowed thousands of their patients to die, they were likewise responsible.

Since now a great man has authoritatively announced the frequent dependence of diseases of the digestive organs on eye-strain, those who continue their policy of not giving their patients the possibility of cure by the method suggested must settle with avenging science and the medicine of the future. They can no longer continue the pitiful and silly cry of, “Danger, danger in such extremism,” with which they and their commercial medical journals have met the demands of progress in clinical medicine.

2. It is a pity that the method of making the announcement of the paragraph was not itself beyond criticism. There is a perfectly well understood and admitted meaning of the term “organic disease.” In the paragraph-title, “Nongastric Organic Diseases,” etc., this definition is contravened and mystified. Ame tropia is not an organic disease. The eye with the low and common errors of refraction is in no way morbid or diseased, least of all is it organically diseased. Only by secondary endeavors to overcome the malfunction of the ametropic eye does organic disease somewhat rarely arise, either in the eye itself or elsewhere. In the vast majority of cases the attempt to overcome the error-called eye-strain—is purely functional. In the same way, in the last sentence of the paragraph, the repetitive misuse of the term is followed by the words “similar gastric conditions.” But the gastric, intestinal and pelvic consequences of eye-strain are at first, and for long, purely functional. As long-continued functional disorder is bound to end in organic disease or anatomic pathology, so here, also, these functional disorders of digestion may finally end in inflammatory and surgical disease. But a wiser discrimination should have guided in the making of the pronunciamento.

The motive may have been excellent which prompted the writer to say, “The subject is familiar to all. Who has not seen,” etc.? But method is often almost as important as motive, and in this instance it is doubtfully so. If it is correct to say that the subject is “familiar to all,” etc., then those who show wilful ignorance of it, those who deny and scoff at it, those who do not bring the possibility of the therapeutic test to their patients—what shall be said of them? Is there any word too denunciatory, any expletive too strong, as applied to one who has seen, often and “familiarly” seen, the relief of eye-strain end bilious attacks, vomiting, anorexia, indigestion and other similar symptoms, and yet who wholly ignores the fact in his published books and articles, who does not act on the suggestion in the treatment of his patients, who scoffs at all reflexes, and who publicly laughs at all such nonsensical theories and theorists. Without the “if,” I do not myself call them miscreants and scoundrels—I only ask, if it is so, is it not scoundrelism? The authority implies plainly that all physicians have seen such cures, are familiar with them, know them to be genuine and true—and yet, well, let us glance at the literature! We must remember that there can not be less than one-third of the persons of the civilized world who are suffering from some of these enumerated symptoms and their sequels. There are

2. This is so true that a great surgeon publicly states that his most brilliant cures of threatened operation, appendicitis, peritonitis, and other “surgical” diseases of the pelvis, have been made without operation, and by sending his patients to the oculist.
several hundred millions of such civilized persons, and hence, admittedly, and at the lowest calculation, there must be a score or two of millions suffering from digestive disorders due to eye-strain. Everybody, plainly implies Professor Musser, is familiar with and admits the fact that the correction of eye-strain gives relief in many cases of gastric and intestinal disorder. Well, if so, why do they not say so and report cases publicly? What kind of familiarity and science is that which is carefully excluded from all publication and open admission? It is, of course, sham familiarity, unscience, nonsense.

First, as to the text-books, treatises and monographs on diseases of the stomach or of digestion.

Boas, 1897, "Diagnostik und Therapie der Magenkrankheiten," does not mention the eyes as possible cause of stomach diseases.

Boas, 1901, "Diseases of the Intestines" (translation of Basch), is likewise oblivious of the "familiar" fact.

Cohnheim, 1905, "Krankheiten des Verdauungskanales," if "familiar" ignores the theory utterly.

Debove and Achard, 1895, and Debove and Remond, 1893, "Maladies de l'estomac," also seem unfamiliar with this theory.

Einhorn, 1903, "Diseases of the Stomach," "has not seen," etc., or, if he has seen, has not spoken of the matter.

Einhorn, 1904, "Diseases of the Intestines," utterly ignores the well-known theory and facts that support it.

Fleiner, 1896, "Krankheiten der Verdauungsgangorgane," would probably agree with the German ophthalmic surgeons in pronouncing such nonsense Amerikanische humbug.

Frenkel, 1900, "Maladies de l'estomac," should come to Philadelphia and study the subject more thoroughly before he writes again. He wholly ignores the theory.

Hemmeter, 1902, "Diseases of the Stomach," should revise almost every page of his treatise if Professor Musser is correct. He has not heard of the theory.

Hemmeter, 1902, "Diseases of the Intestines," inferentially denies both the facts and the familiarity. He is still silent.

Kahane, 1900, "Therapie der Darmkrankheiten," is a sorry teacher if he has seen and is familiar with such facts.

Mathieu, 1900, "Maladies de l'estomac," writes strangely if he knows the role that eye-strain plays in those maladies, for he does not speak of it.

Martin, 1905, "Diseases of the Stomach," is equally to be criticized.

Piek, 1895, "Magen und Darm-Krankheiten," does not allude to the affair.

Rodari, 1904, "Magen und Darm-Krankheiten," wrote too long ago, probably, to have heard of facts which in 1905 are "familiar to all."

Soupault, 1905, "Maladies de l'estomac," does not agree that "all" should be construed as including French physicians.

van Valzait, 1908, "Diseases of the Stomach," is a sorry teacher if he has seen and is familiar with such facts.

Wegler, 1905, "Magen und Darm-Erkrankungen," is also not to be included among the "all."

Of all the recent text-books on gastric and intestinal diseases that I could find in the library of our College of Physicians, the 18 mentioned do not contain any reference whatever to what Dr. Musser says is admitted by all. I have found two, however, who do refer to it. The first is:

Reed, 1904, "Lectures on Diseases of the Stomach and Intestines," under the heading, "Acid Gastric Catarrh," p. 825, has these inciting, powerful and emphatic words: "The occlusists include eye-strain among the possible causes." And we yawn, beyond consolation, to know what "occlusists" so include," and where the references may be found.

The second is:

Herschel, 1895, "Indigestion," under Reflex Causes, p. 44; this ignored teacher does not ignore, and includes himself among the "all." He writes:

"A considerable amount of attention has been paid of late to the possibility of gastric affections being set up reflexly by eye-strain. George M. Gould, in a paper published in 1890 in the International Journal of the Medical Sciences, stated that he had found that in the young of either sex eye-strain, to a considerable extent, often interfered with the digestive process. My own experience bears this out, as I have had in my own practice several cases in which digestive troubles appeared to depend on astigmatism. One patient in particular, a chemist in the city (London), a highly neurotic individual, used to suffer from great flatulence during the morning hours. I discovered that he was astigmatic, that he lived out of town and read a paper coming up in the train. He informed me that the flatulence invariably came on as soon as he commenced to read the paper in question. The gastric troubles promptly disappeared as soon as he discontinued reading on his way up to town."

Thus eighteen out of twenty recent systematic treatises on diseases of the digestive organs completely ignore what a great authority says is a well-known and highly important cause and cure of such diseases; one smiles at it in a line, and one devotes to it a half-page—with sympathy and respect, President Musser should gladly note:

"How is it with the systematic practices of medicine? A highly important cause, known of all, of a vast number of cases of disease, and the means of speedy cure, should, of course, be extensively and minutely set forth and emphatically urged on the attention of the students and practitioners who receive the teachings of the great scientists and instructors. I have examined carefully the following "Systems," and "Practices," and Text-books: Leo, Allbutt, Mathieu, Ewald, Nothnagel, Debove and Achard, Anders, Bain, Bouchard and Brisseau, Brouardel, Hare, Bartholow, Hughes, Klemperer, von Mering, Monro, Osler, Salinger and Kaltvyer, Tyson, Gibson, Butler, Hare, Kuhneman, Lyon, Cohen and Eshner and others.

Why do they entirely fail, even in that old foolish allusion, that is meant to be illusion, in the reference that refers nowhere, the indexing that demonstrates the author's omniscience, but also his total unconcern? But even here the rule has its exceptions, and some unmentionables may be mentioned: Allchin, vol. v, p. 235, wrote in 1905: Not a few cases of nervous dyspepsia may be traced to causes acting reflexly, especially pelvic disease, and even, it is asserted, to eye-strain and astigmatism.

French, 1905, has one or two similar strabismic allusions.

Da Costa, 1900, refers to it still more gingerly. 

Hare, 1905, "Practical Therapeutics," generously allows two lines to the subject: "Eye-strain may cause stomachic disturbances, flatulent dyspepsia and a variety of general or so-called reflex neuroses."

Musser, 1904, "Medical Diagnosis," is not so generous concerning a factor of great importance in 1905, and one "familiar to all." He allots one word to it: "Gaistic neuroses may arise directly from disease of the stomach or reflexly from disease of other organs, the brain, the spinal cord, uterus, kidneys, liver, eyes or nose."

It is good to know that the eyes are the seventh in order of importance, and are listed before the eighth, the nose—a righteous nosology, one might add.


3. The conjugation of these two words, as is most common, shows that the writer has not a faint conception of the real nature of "eye-strain."
March 24, 1906.

Eye-strain—Gould.

849

One of the most prolific causes of functional gastric disturbances is eye-strain, and almost any neurosis may be induced by it. Gastric hyperesthesia, accompanied by hyperchlorhydria, to be followed later by more or less anemia and achlorhydria, seems to bear a definite relation to astigmatism of high degree. Without attempting to refer the condition to any special form of eye-strain, we have, nevertheless, been impressed with the frequency of the association of astigmatism and muscular imbalance with painful sensory conditions of the stomach, especially taking the form of distress and pain associated with belching after meals, with a good appetite, but voluntary starvation through dread of pain induced by eating. These patients suffer for years and are made rather worse than better by restricted diet.

Stockton, 1903, in “Nothnagel’s System,” American edition, article on “Diseases of the Stomach” (not in the original), comments, p. 163, as follows:

“Cases of so-called typical gastric vertigo not infrequently depend on uncorrected eye-strain, especially on anisometropia. It is true that the attacks are often precipitated by transient disturbances in digestion, and these digestive derangements in turn may be occasioned by some eye-strain that predisposes to the vertigo. In several instances I have seen the disappearance of both vertiginous and gastric symptoms follow a careful and painstaking correction of the refractive error.”

Again, under “Gastric Neuroses,” p. 256, he says:

“As earlier stated, eye-strain has been found a frequent cause of functional stomach trouble, especially among those who are living an indoor life and are accustomed to the close use of the eyes. This is particularly true in cases of mixed astigmatism and anisometropia, and is often associated with muscular imbalance.”

Dr. Stockton has also placed himself on record more definitely and fully in the same way in an article entitled, “Hygiene of the Digestive Apparatus,” in Dr. Pyle’s “Personal Hygiene,” issued in 1904.

Of the thousands of articles, clinical or pathologic, by physicians, that in the last dozen years have appeared in the medical journals on the subject, it may be said that, in all probability, not one has recognized or emphasized the truth set forth by Dr. Musser in the few lines quoted. It is needless to enumerate. A typical example comes to hand as I write, a solemn address by Robert Hutchinson4 on “Dyspepsia.” Like a multitude of others, filled with light but not in the least enlightening, it is utterly oblivious of the eye-strain origin of this most common of modern diseases. No F.R.C.P. would dream of allowing such a thought to appear or even to be mentioned by him in a public way.

Thus, with the exception of one or two brief allusions in the authoritative text-books, the “scientific” medical men of the world give no hint of their “familiarity” with a highly important source and cure of the most common of all diseases. Plainly, therefore, Dr. Musser is in error as to the knowledge of the fact by medical men. This error clearly arises from the attempt to promulgate a scientific truth by a method which shall ignore the history of the discovery and “save the faces” of those who have wilfully ignored the truth discovered and fought for by others. This may be good politics, but it is unjust, and the question remains: Will it stop the ignoring and the snering of the “conservatives”?

If, as Dr. Musser avers, eye-strain, known of all, is responsible for a large share of the disorders and diseases of digestion and nutrition, the oculists, especially of the United States, should long ago have received the truth eagerly and should have proclaimed it loudly from the house-tops and from their text-books. It is needless to say that it is not so. I need not weary with all the negative citation of authors.

If the truth of Dr. Musser is true, the refractions of our oculists were the means of demonstrating the truth. So far as I know, only one such oculist has publicly confessed.6 Concerning sick headache or “migraine,” many have done so, and in other essays I have given the details, quoted the writers and established the question of priority. Sick headache, however, is not the subject now under discussion. Although that disease consists in the most profound and revolutionizing morbidity of the digestive process, it presents, in the main, a different clinical picture from that of “bilious” attacks, periodic vomiting, anorexia, indigestion, and other gastric symptoms described in the quotation taken as a text.

3. The significance of Dr. Musser’s statement is not recognized, and its far-reaching consequences not discriminatingly appreciated. If it is true, then the professional and the social bearings are tremendous. It may be seen at once that the practices of nearly all physicians must be thoroughly changed in the majority, or in a large minority, of the patients consulting. Not even the specialists can be excepted, because, seek where one will, do not the majority of diseases spring directly from the disorders and diseases of digestion and nutrition, or are intimately based on or associated with them? How large a portion of the drugs advertised are directly or indirectly aimed at those conditions? What is the whole nostrum, patent and proprietary medicine business but the organized attack of quackery on the demons of “dyspepsia” and denutrition? Seventeen or eighteen years of clinical observation and study have convinced me that a far larger proportion of all gastric and intestinal diseases are due to eye-strain than even Dr. Musser and Dr. Stockton would admit.

4. If I am in error, I shall be happy to be corrected, but I think I have not mistaken when I say that the recognition of the truth of the ocular origin of these diseases of digestion was begun, and for ten or a dozen years was advocated, solely by me. I care nothing personally for questions and quibbles as to priority, but I am proud of the fact that I early and long and boldly set the truth forth, and have held to it, at first in face of the silence of all others, then in spite of their ridicule and jeers. I began the crusade in 1888, publishing my first clinical report early in 1889* of a case of dyspepsia of twenty years’ duration cured at once by glasses. I considered attentively the clinical details and the physiologic grounds of the morbid function, its cure, etc. In January, 1890, I again gave the details of other cases, and stated that I had had in all twenty-eight patients in whom dyspepsia, anorexia, nausea, etc., were cured by the extinction of eye-strain. Later, in the same year, I again returned to the charge, giving proofs and repeating the conviction that “eye-strain produces digestive troubles of various kinds, all resulting in malnutrition, anemia”7 etc.

In 1891, I reported on 277 cases of digestive and assimilative disorders (anorexia, fickle appetite, consti-

5. After the above words were written, a second noteworthy exception comes to my hand, the article of Dr. Griffin, in The Journal of the A. M. A., Jan. 6, 1906. Under “Disorders of Eye-strain,” this frank man publishes reports of cases, diseases of the digestive organs due to eye-strain and cured by ocularr treatment. All honor to him.

6. Medical and Surgical Reporter, Feb. 9 and March 9, 1889.

7. American Journal of the Medical Sciences.


pation, dyspepsia, nausea, vomiting—not sick headache—car-sickness, etc.), and I wrote thereon:

“For a long time I have been begging my friends, the general practitioners, to heed the fact that digestion and assimilation may be directly and profoundly disordered by eye-strain. Nothing seems more true in medical science than this.”

And much of the same purport.

Since then I have continued nearly every year to beg consideration of the fact. Not an oculist published a line of assent or seconding. At last I convinced one of my friends in general practice, especially one great physician of national fame, by the best of demonstrations—the restored health of patients. The misfortune of the theory consists in the self-evident fact that the cures depend on an accuracy and refinement of practical refraction which has been almost impossible and unknown and which is now only becoming more general.

The manner in which the recognition of the truth is coming about illustrates so admirably the ancient psychologic way that it should be noted. Years of utter silence and ignoring follow a discovery and the repetition or re-emphasis of it by the foolhardy. Then follow ridicule, calumny, coarse dogmatism and stupid opposition of the leaders who do not lead, the authorities who are without authority, the editors who sell themselves to the Zeitgeist or to their commercial salary-givers, the indifferent multitude who follow blindly the blind guides. Finally, one after another acknowledge the truth, long evident to many, impossible longer to be slandered or ignored. But the distinguishing characteristic of the confession is that it is “familiar to all” and admitted by all; but still persists the death-like silence as to how the discovery was made, by whom recognition was made necessary. There is not a hint of gratitude to those who have sacrificed themselves in the cause of truth and discovery. Instead it is said; “It is familiar to all.” “That is an old story.” “We have always said so”—and then is renewed the custom of ignoring and maligning the new and different truth that, in its turn, is struggling for a chance to release other millions from their sufferings. “Conservatism” may be most expensive and criminal when it conserves only error.

There remain several important postscripts to be carefully considered:

1. It is evident that a breach has been made in what seemed the impenetrable walls of the professorial and authority-making classes. Heretofore all students of history and psychology have found that the real discoveries in medicine are ignored, scorned and opposed by the contemporary “authorities,” the leading practitioners, the professorial and presidency seeking, the committee-forming, and the book-making class. Some of the men composing this class are too often too far interested in themselves, their own personal success and fame. Some are seeking to hold their dearly gained and slippery power, too occupied in courting popularity, hunting LL.D. degrees, baronetcies, trustee-ships, other professorships and presidencies, too desirous of doctoring the rich and those dying of organic disease, to have care for the functional diseases which, long neglected, at last land the prematurely dying in the hands of the famous consultants.

The question returns as to the sincerity, the effective-making and the permanency of the admission. And, first, as to the sincerity. In Dr. Musser’s own text-book of last year’s dating, there is but one word out of hundreds of thousands devoted to the matter “familiar to all.” In his own article from which I quote, there are some 1,400 words, of which 40 are devoted to a mere statement concerning the ocular non-gastric diseases.” In the discussion of Dr. Musser’s paper there were 14 participants. Their opinion of Dr. Musser’s “familiar to all” admission was shown in the fact that not one considered it worth even alluding to. Now, if this is a truth of value, the matter needs to be set forth in a discriminating and serious manner. We must have the rules of diagnosis to determine the methods whereby eye-strain sets up these symptoms and how certain kinds of strain beget certain digestive diseases. We need more than all the proofs that these general practitioners and gastrologists have cured these patients. Let the cases be reported. The editors of the great official organs of their societies will print such articles from these great men, but they often refuse to do so when the little men and the hobby-riding oculists send their manuscripts. The editors are great friends of the “authorities.” The truth is, of course, that the glittering generality, the general and vague admission, is not taken seriously; nor is it meant to be so taken.

The “familiar to all” vagueness is merely a sop thrown to Cerberus and a method of “saving one’s face,” so that in future years, when the desipled “enthusiast and exaggerator” shall have died in establishing the contemptible truth, then those who have killed him (and their patients) by the “damning with faint praise” may proudly say, “We knew all this a generation ago and urged it and practiced it.”

3. But did they know and practice it? If so, the proceedings of the great societies of oculists (through whom alone the truth could be demonstrated) and the ophthalmic text-books must show the thousandfold proofs of the theory of eye-strain as a cause of gastric diseases. With dreary monotony they absolutely omit such proofs and go on to discuss the cure, not the cause, of ocular tumors, inflammatory and surgical diseases. Of refraction problems and gastric diseases there is no curiosity or mention.

How is it in practice? Will Dr. Musser’s colleagues, their great professors and text-book makers, see to it that the eyes of these patients have been accurately “glassed?” Will the leading diagnosticians and practitioners of New York, London, Paris, Berlin, Boston, Chicago, San Francisco, Philadelphia, Baltimore, New Orleans, and the rest, when a patient comes to them next week, seek to learn if there exists eye-strain? If they do this will they do more than to ask in an incurious and humdrum way: “Have you been wearing glasses?” If they get a reply, “Yes, from a good eye specialist,” will they rest unsatisfied? Do they care to go into the matter earnestly, scientifically? Do they seek to know that, as a rule, the greater the reputation of the “ophthalmic surgeon” the more certainly will his prescription of lenses be wholly inaccurate and wrong? Will they seek to learn that there are some 100 good and sufficient reasons why the glasses worn by patients generally are unscientific and incapable of relieving eye-strain? “Familiar to all” may be an astute (or blunderful (?) ) way of rendering a truth unfamiliar to any.

10. At the same time the editor of the British Medical Journal accepted the MS. of Hutchinson referred to, he refused an excellent article from an English oculist showing the dependence of “dyspepsia” on eye-strain.
4. The admission, "familiar to all," may be worse than continued silence and scorn. About thirty years ago a leading practitioner wrote several articles admitting most that “the eye-strain crank” could wish, logically imp the all that he now claims and gives excellently reported clinical demonstrations. He soon saw that the professional mind could not, and would not, take in the truth. It was ignored utterly and contemptuously. The promulgator realized his error and joined forever the ranks of the ignorers. About thirty-four years ago an American oculist, known of all, stated the clear truth that sick headache is caused by eye-strain. From that day to this, if I am not in error, he has never dared to repeat the hazardous admission or even to allude to it. Thus it may be seen that there are good reasons for suspecting that political shrewdness and tactical acumen often have to do with hindering the progress of medicine, and that a cunning selfishness may require that thousands of patients should continue to suffer rather than that the truth should be preached, a truth which medical dogmatism may not allow to prevail.

THE DIAGNOSIS OF RENAL CALCULUS.*

GUY L. HUNNER, M.D.
Associate in Gynecology, Johns Hopkins University.
BALTIMORE.

Few diseases present such protean symptoms and simulate such a varied array of other maladies as stone in the kidney. This is particularly true if we include in our considerations stone in the ureter.

The smallest stone may cause typical agonizing symptoms not easily mistaken even by the patient, while without attracting notice large stones may occupy both kidneys, causing insidious destruction of these organs and sudden death from anuria. In the consideration of this subject I will first discuss the diseases of the kidney which we must differentiate from calculus nephritis, and will then take up those diseases of neighboring organs which most commonly mislead us in diagnosis.

COMMON KIDNEY DISEASES TO BE DIFFERENTIATED FROM CALCULUS NEPHRITIS.

The more common kidney diseases of which we must always think in making a diagnosis of stone are tuberculosis, pyelitis, pyelonephritis and pyonephrosis from the ordinary pus-producing infections, tumor and intermitent hydronephrosis.

Tuberculosis.—At our Atlanta meeting, two years ago, I had the pleasure of reporting thirty-five cases of tuberculosis of the kidney occurring in the practice of Dr. Howard A. Kelly and his associates in Baltimore. It had been my privilege to study the urinary condition in most of these cases, and you may remember that I laid emphasis on the importance of urinary examination in making a diagnosis of renal tuberculosis. The same law holds in renal calculus—we must study the urine.

Our only positive diagnosis of renal tuberculosis is the finding of tubercle bacilli in the urine or causing the disease in guinea-pigs by the inoculation of the urine or the diseased tissues taken from the bladder. In calculus kidney the urine may show sand or a stone. The x-ray and the wax-tipped bougie are invaluable means for making a positive diagnosis, but these methods both fail at times, and if we would enjoy a full measure of success in kidney work we must insist on a careful study of the urine. Blood occurs in the urine in both stone and tuberculosis. The amount varies in both diseases from microscopic quantities requiring both the centrifuge and microscope for the discovery of the few corpuscles present to several hundred thousands threatening a patient's life. The amount of blood is more likely to be influenced by exercise in cases of stone, but we sometimes have to search repeatedly before finding a few corpuscles, marking the only change in the urine. Pus in the urine, at least in microscopic quantities, may always be looked for in tuberculosis, while a large percentage of stone cases are aseptic and free from inflammatory reaction, especially in the early stages, and leucocytes, if present, can be accounted for by the amount of blood. I have found that some stone cases with only a moderate number of red corpuscles and leucocytes may have a strikingly large number of epithelial cells.

Pain as a differential symptom between stone and tuberculosis is unreliable. In either case there may be entire absence of pain. Either disease may cause only a dull backache or an indefinite nagging sensation in the lumbar region. In either disease the pain may occur in the most severe paroxysms due to blocking of the ureter by a blood clot, by a plug of detritus, or in calculus disease by a stone. At such times the kidney is likely to be enlarged and the urine may be temporarily clear.

Palpation findings in the kidney region are not characteristic, as in either disease the kidney may be smaller than normal because of atrophic sclerosis or it may be greatly enlarged from fibrosis, lipomatosis, hydronephrosis or pyonephrosis. Palpation of the ureter is of more value, as a large proportion of the tuberculous cases show thickening of the ureter after the disease is advanced in the kidney. In the infected stone cases the ureter may be thickened and simulate the tuberculous ureter. In ureteral calculus the stone is in the lower end of the ureter in 50 per cent. of the cases, and in women it can usually be palpated through the vagina or the rectum. In diagnosing a case as tuberculosis on the evidence of finding acid-fast bacilli in the urine, we must always use the differential stain, as illustrated by the following case:

Case 1.—Mrs. J. B. S., aged 42, married seventeen years, the mother of two children, was admitted to Dr. Kelly's service at the Johns Hopkins Hospital in 1901. The patient had complained at intervals for the past four years of attacks of intense pain in the right lumbar region. She described the pain as labor-like in character, and said that it extended downward toward the bladder and down the thigh as far as the right knee. The attacks lasted from twenty-four hours to five days. Sometimes they were accompanied by chills, nausea and vomiting and constipation. During the attack the patient passed little urine, but had the constant desire, and after the attack a large quantity of urine was noticed. She sometimes had decided blood tinge in the urine during and after the attack. She never passed gravel. There was always sensitiveness in the right hypochondrium during the attacks. The patient came to Dr. Kelly with a diagnosis of renal tuberculosis, a report having been made from a state laboratory that tubercle bacilli had been found in the urine in abundance. Leonard, of Philadelphia, one of our most expert Roentgen-ray specialists, had failed to get a stone shadow. I examined catheterized specimens of urine without finding pathologic content, and the laboratory in question soon telegraphed to defer the operation, as the bacilli had been found to be smegma. In physician, Dr. Kelly operated because of the symptoms and blood in the urine and found an oval stone about 2 cm. in length in the pelvis of the kidney.

Pyelitis, Pyelonephritis, Pyonephrosis.—It may be impossible, except at operation, to diagnose any one of