These circumstances, therefore, point out to us clearly the action of these muscles in so many other processes than respiration, but which are yet more or less connected with it, that their action in it alone may be easily seen. And since, to perform these other actions, they must be influenced by muscular nerves, we are, I think, justified in believing that as the actions correspond, so do the causes exciting them, and that therefore the abdominal muscles are influenced in respiration (as far as they are by nerves) by the *anterior* portion of the spinal cord, and that no particular part of the cord is devoted to this action alone.

By this explanation all ideas of there being a respiratory column are considered as erroneous. All the spinal nerves, therefore, below the first, must, I think, be considered as being entirely for sensation and motion, while the only proper respiratory ones must be granted to be those connected with the medulla oblongata, whose destruction puts an end to respiration.

Though thus differing in many parts from the opinions of Sir Charles Bell, yet I must say that I have not done so from any vain wish to obtain eclat for pretended discoveries which future observations may contradict. But there is here nothing but a plain statement of the results of my own observations; and as all of them have been witnessed by others, no hesitation is felt in maintaining their correctness.

Having also mentioned particularly the manner in which the operations were performed, it is now in the power of any who may doubt their results to prove their correctness. Knowing the liability of any one to mistake the effect of certain causes, my object will have been fully attained if, finding myself proved to have been mistaken, attention shall have been called to a subject which is worthy of the consideration of the most skilful experimenter.

ART. III. *Diseased Kidney, with Albuminous Urine.* By T. C. ADAM, of Lenawee County, Michigan.

The attention of the profession was first called to the connexion between a peculiar organic disease of the kidney and a coagulable or albuminous state of the urine, by Dr. Bright, in the first volume of his "Reports of Medical Cases," published in 1827. The result of his experience, as contained in that volume, may be thus stated: When the urine in dropsy is albuminous, and more or less coagula-

ble by heat, the kidneys have been found diseased in structure, the liver being generally but slightly affected. On the other hand, when dropsy has been dependent on disease of the liver, and the kidneys have not been diseased, the urine has not been coagulable. When both liver and kidneys have been structurally diseased, the urine has also coagulated. "I have never yet," says Dr. Bright, "examined the body of a patient dying with dropsy, attended with coagulable urine, in whom some obvious derangement was not discovered in the kidneys." We do not claim for Dr. Bright the merit of having first pointed out the connexion between dropsy and disease of the kidney, although he first indicated the frequency of this connexion; but, we are well assured, that to him is incontestably due the honour of having first established the important fact, that organic disease of the kidney can be detected during life by its connexion with coagulability and low specific gravity of the urine.

Ever since 1828, when we first became acquainted with these results of this very eminent physician's researches, we have been attentive in procuring evidence which might establish or overthrow the stability of this index to a desirable diagnosis. Judging by the infrequency of publication upon this subject, we should be induced to conclude that neither in this country nor in Europe has this valuable discovery in diagnosis secured, among the generality of practitioners, that degree of attention which its importance and frequent applicability would seem to demand. That renal diseases with an albuminous state of the urine are not of uncommon occurrence I am inclined to believe from the fact that Dr. Bright, whose attention has been directed to these complaints for upwards of ten years past, has recently given it as his opinion that not less than 500 persons fall victims to them, in London, during the course of a single year. Moreover, in conversation with medical men upon this subject, I have been told, that they could recollect several cases whose course and history corresponded very closely to the symptoms and progress of these renal diseases, and concerning the seat and nature of which they were, at the time, in no small degree perplexed. From their recollections they have little doubt of these anomalous and puzzling cases having been identical with those now under consideration.

Moved by these considerations, it occurred to us while lately drawing up a report of a case of this kind for the information and satisfaction of the family physician and friends, at a distance from whom the patient died, that the substance of that report might be no unacceptable offering to my brethren; especially, as on searching the annals of medicine, it appeared that so few had claimed their atten-

tion on the subject. We proceed, then, to submit to the profession the principal part of the report alluded to, and of the reflections with which it was accompanied.

When your former patient, D. L. S., first applied to me about the middle of February last, he complained of an occasional inability to speak plainly, arising from a sensation like globus in the throat, and of a feeling of numbness in the left side of the face, which was observed slightly to drag, about the corner of the mouth. This partial paralysis of the face, which depends, in all cases, upon a disordered, debilitated, or morbid condition of the portio dura of the seventh pair of nerves, could not, after strict inquiry, be traced to any of those local causes in which it *generally* originates. No blow or external injury had been received; no gland in the course of the nerve could be discovered to be swelled; there was no suppuration in the ear; and finally, there was no reason to suspect any suppuration or effusion at the basis of the brain from any previous inflammatory condition. Nor had that side of the face been exposed to any current of cold air. In the absence of these—the usual causes of this curious affection—I was left to conjecture upon the agent which was producing the paralytic condition of this nerve. Of all my conjectures, that seemed the most probable which referred the disease of the nerve to some congestive state of the brain in the vicinity of the origin of the nerve, or to some effusion or pressure there. Headache, slight wandering of the mind, sleeplessness, and other minor cerebral affections were the data which determined me to adopt this conjecture. The tendency to low forms of arachnitis in those whose urine contained albumen, as did that of D. L. S., assisted in determining me to this *theory* as to the nature and cause of the facial paralysis. I am no urine-doctor; but a history of his previous complaints, and a sense of the importance of ascertaining the state of this secretion, determined me at this early period of the disease to inquire into the condition of the function of the kidneys. Perhaps it would be better that the majority of practitioners should feel as did Hippocrates. *Per vesicam prodeuntia inspicere oportet, an sint qualia sanis prodeunt.* That a certain set of physicians carried this investigation to a ridiculous extreme, is no good reason why others should run into the opposite extreme, and neglect this method of investigating disease altogether. That the brain was in a state quite liable to take on, or become the subject of, either congestion or effusion, I farther thought probable from the fact, that his constitution, compared with what it had been previous to the attack of hæmaturia and inflammation of the kidneys seven months

previously, was what might be very appropriately called very much 'broken down.' That the brain in such a state should be very nearly in the condition in which it is found in those who die of phthisis, dropsy, and other exhausting diseases, seemed quite probable. In such there is generally effusion and softening. That some morbid condition of the base of the brain, which affected the facial nerve with paralysis, should likewise be the occasion of the peculiar feeling in the throat, by affecting the glosso-pharyngeal and ninth pair at their origin, was the opinion which I adopted, or felt inclined to prefer in explanation of this other symptom. Such was the manner in which I interpreted the symptoms and history of this case—such the views which I adopted concerning the real, intimate or proximate pathological condition, which had come under my care.

You are well aware that we are called upon, in a majority of cases, with inconsiderate and incommoding haste, to give an opinion to the patient and his friends as to the nature of the disease under which he labours, and its probable termination. This part of our duties requires no inconsiderable exercise of judgment and consideration. Before giving any decided opinion, I thought it necessary to subject specimens of the urine to some of the usual tests of the presence of albumen. The unfavourableness of my prognosis was to be regulated, in a great degree, by the quantity of albumen found in the urine. We all know that even healthy urine contains a small proportion of this principle. Cruickshanks found that the precipitate which he procured by adding an infusion of tannin to healthy urine, amounted to $\frac{1}{240}$ th part of the weight of the urine. This will not cause coagulation by heat, which requires a notable impregnation; but it is generally found (though not universally) that a precipitate can be procured from healthy urine by means of a saturated solution of corrosive sublimate. Perhaps it might be found universally in this condition, if the urine were taken about two or three hours after eating. But this by the way. Some, with Dr. Mackintosh, were inclined to smile at Dr. Bright's supposed discovery of the connexion between diseased kidney and coagulable urine, because they found, or *were told*, that they could produce at pleasure this state of the urine by some slight derangement of the digestion—almost certainly by heavy, unfermented bread, dumplings, pastry, and other preparations of flour containing 'shortening,' lard, suet or butter. But in two important points it has been ascertained that this occasional impregnation of the urine with albumen can be distinguished from that arising from diseased kidney. In the first place it is transient, not continuous, and generally disappearing after a few hours, as ascertained by Gregory and

Christison. In the second place, coagulable urine continuously secreted and connected with disease of kidney, has been uniformly found of a very low specific gravity; (1013.18 being the average of Gregory's fifty cases, and 1014 and a fraction being the average of nineteen cases published by Dr. Bright, and determined by Dr. Bostock;) while albuminous urine caused by temporary derangements of the digestion is not attended by any reduction of its usual density. I mention these circumstances chiefly to show you that I was on my guard against any deception in the *data* for the attainment of which I made my examinations of the urine, and which were to serve as the basis of my wished for prognosis. In all my trials I could obtain precipitates (of albumen) by means of muriate of mercury, acetate of lead, nitrate of silver, and other metallic salts. In some of my trials, I could obtain coagulation by heat, (in a spoon over a lamp,) though generally in all trials by heat there was a cloudiness and frothiness. From concentrated urine I could obtain solid albumen by agitation with alcohol. Nitric and muriatic acids were also employed, as Dr. Gregory recommends as a point of some importance, that when it is wished to ascertain the presence of albumen in suspected urine, "one or more other tests should be added to that of heat, in order to guard against a possible source of error." Corrosive sublimate, though the most delicate test of the presence of albumen, is not to be depended on, as it causes in healthy urine a precipitate, exactly similar to that which it causes in the urine of kidney disease. Alcohol, and the above named acids, are not liable to any such objection.

Having thus ascertained that the urine, not only after meals, but continuously, was impregnated with albumen, and having been told that the *appearance* of the urine after cooling had been for months, and ever since our patient had left home, exactly the same as at present, I was furnished with data from which I might, with a high degree of probability, satisfy myself as to the morbid condition of the kidney, and venture upon a pretty decided prognosis, taking into consideration also the tendency to cerebral disease and other symptoms. Accordingly, about the fourth day of my attendance, I gave a very unfavourable prognosis to his friends here, of which Mr. S. advised you in one of his earliest communications to the parents of the patient. For the qualified phrase, 'high degree of probability,' which I have just made use of, I might have substituted the unqualified term, certainty, had I known I could depend on the recent observations of Dr. Osborne of Dublin. According to his investigations in Sir Patrick Dun's Hospital, he has not met with a single instance of urine coagulating in a constant manner, in which post-mortem ex-

amination did not afford proofs of disease of the kidney; "nor on the other hand, an instance of disease being found in the kidney after death, in which, on taking a specimen of the urine in the bladder, it did not coagulate." But this, though the result of a good many observations, may not turn out to be a general law, and I therefore preferred the more moderate assumption. I had no instrument to determine the specific gravity, else I should have made observations as to the characteristic lowness of the gravity of the urine of kidney disease.

The following circumstances were taken into consideration while endeavouring to determine the intimate pathological condition of my patient, and the probable termination of the case. About eighteen months previously to his present illness he had an attack of scarlatina; and seven months before he had an acute attack, with hæmaturia. For several months subsequent to this latter attack he had inclination to pass urine frequently; and during all these seven months he could not recollect that he had perspired. He has had a constant pain in the lumbar region, and has felt so much enfeebled that he could not bear any active exertion. His sleep has been disturbed and unrefreshing; his digestion languid, sometimes uneasy, and latterly there has been occasional vomiting. My early attempts to restore perspiration and to improve the function of digestion were unavailing. I subjoin a few remarks by Dr. Bright, relative to the symptoms and progress of those cases of renal disease which have been the subjects of his observations. When you shall have read them, you may easily imagine the thoughts which must have passed through my mind when bringing them to bear on my case. "A child, or an adult," says Dr. Bright, "is affected with scarlatina, or some other acute disease, or has indulged in the intemperate use of ardent spirits for a series of months or years; he is exposed to some casual cause or habitual source of suppressed perspiration; he finds the secretion of his urine greatly increased, or he discovers that it is tinged with blood; or without having made any such observation, he awakes in the morning with his face swollen, or his ankles puffy, or his hands œdematous; if he happen, in this condition, to fall under the care of a practitioner who suspects the nature of his disease, it is found that already his urine contains a notable quantity of albumen; his pulse is full and hard; his skin dry; he has often headache, and sometimes a sense of weight or pain across the loins. Under treatment more or less active, or sometimes without any treatment, the more obvious and distressing of these symptoms disappear; the swelling, whether casual or constant, is no longer observed, and the urine ceases to evince any admixture of red particles; and according to the degree of importance

which has been attached to these symptoms, they are gradually lost sight of, or are absolutely forgotten. Nevertheless, from time to time, the countenance becomes bloated; the skin is dry; headaches occur with unusual frequency; or the calls to micturition disturb the night's repose. After a time, the healthy colour of the countenance fades; a sense of weakness or pain in the loins increases; headaches, often accompanied by vomiting, add greatly to the general want of comfort; and a sense of lassitude, of weariness, and of depression, gradually steal over the bodily and mental frame. Again the assistance of medicine is sought. If the nature of the disease is suspected, the urine is carefully tested, and found, in almost every trial, to contain albumen, while the quantity of urea is gradually diminishing. If, in the attempt to give relief to the oppression of the system, blood is drawn, it is often buffed, or the serum is milky and opaque, and nice analysis will frequently detect a great deficiency of albumen, and sometimes manifest indications of the presence of urea. If the disease is not suspected, the liver, the stomach, or the brain divide the care of the practitioner, sometimes drawing him away entirely from the more important seat of disease." Had I been unacquainted with the researches of Dr. Bright and his successors upon this subject, I should, most probably, have considered this case as obscure and anomalous; but, like the practitioners last referred to, should have allowed none other than the more important seat of disease to have absorbed my attention.

I inquired very accurately to ascertain the former or the present existence of any dropsical effusion, but could not detect that there existed, or ever had, even puffiness under the eyes, or œdema of the ankles. My impression *then*, was, that some form of dropsical effusion generally coexisted with disease of the kidney. On farther inquiry, I find that this is not a necessary or even a prevailing accompaniment. The following passage, bearing on this point, I found in Dr. Gregory's report.

"The proportion of cases in which dropsical effusion was a prominent symptom is large; but it would be incorrect to draw any conclusion on this point from these cases alone, as in almost the whole of them it was the presence of dropsy which led to the examination of the urine. Out of the whole number, however, that is to say, out of the eighty cases, more or less of dropsical effusion existed in fifty-eight, which is sufficient to prove that although not an essential symptom, dropsy is a very frequent concomitant of this alteration of structure in the kidney."

The pain in the loins of which D. L. S. had made complaint from the time of the acute attack accompanied with hæmaturia, which oc-

curring seven months previously to his last illness, I did not consider as of much value in diagnosis, except so far as it went to confirm more unequivocal marks of disease. Without the other diagnostic symptoms, I should have paid but little attention to this lumbar uneasiness; for in almost all the complaints of women, and in many of those of the other sex, a feeling of weakness, uneasiness, or pain in this region is quite a common occurrence. But, in the language of Dr. Gregory,

“I have now seen so many cases in men as well as in women, in which pain of the loins had formed a very prominent symptom during life, and in which this disease of the kidneys was found after death, that I am inclined to consider it an important diagnostic symptom when taken along with other and more unequivocal signs.”

I have detailed, I hope, with sufficient minuteness, the symptoms which attracted my attention while investigating the nature of the disease and establishing a diagnosis; and I have endeavoured to show that my interpretation of these signs was in accordance with the doctrines of the most competent authorities upon the subject. There can scarcely exist a doubt that the views which I adopted were the true ones. Dr. Bright says that he is “not aware of any disease in which the character is more completely preserved, or in which the symptoms more clearly mark a specific form of malady.”

I shall now sketch an outline of my remedial treatment, and of the course of the disease. The means which I employed were directed to one or more of the following indications. Firstly, to palliate or remove the radical disease in the renal organs; secondly, to obviate the agency of the renal disorder upon the brain and nervous system, and to remove the existing effects of that agency; thirdly, to improve the state of the digestive and nutritive functions generally, and enable the constitution to bear up against the destructive operation of the primitive disease and its consequences. In accordance with these I first of all applied blisters to the nucha and back of the ear on the paralysed side, and subsequently dressed the blisters with an ointment containing a small portion of emetic tartar. This preserved the blistered surface from healing, and kept up a continuous irritation. I next employed mild alterative and laxative medicines to remove sordes and improve the state of the digestive apparatus, of which the chief ingredients were rhubarb, ipecacuanha and aloes. I avoided every form of mercury, because it has been thought by the most competent authorities to accelerate kidney disease, and to be more prejudicial than otherwise. Dr. Bright, upon this subject, says, “In general, it has appeared to me, that those who, in the con-

firmed forms of this renal affection, have abstained from mercury, have broken down more slowly under the disease than those who had taken it to any extent, more particularly if they persisted till its constitutional effects have completely manifested themselves." In the experience of Drs. Gregory and Osborne, mercury has not been found beneficial. For these reasons I abstained from the administration of mercury in any form. Flannel was worn next the skin, a diaphoretic regimen adopted, and as there was great depression of the nervous energy, ammonia was preferred to any other diaphoretic from the materia medica. Under the treatment of which the above formed the principal part, the facial paralysis and difficulty in speaking gradually disappeared, and the headache moderated a little, and was complained of more towards the vertex than in the temporal and frontal regions as formerly. But there could not be said to be any improvement in the state of the stomach and bowels: there was languid action, dark coloured secretions, and the tongue remained very heavily coated. No sensible perspiration could be obtained with all 'appliances' and domestic 'means to boot.' The skin remained dry and unperspirable. Although the paralysis of portio dura was disappearing, yet I could not allow myself to suppose that the brain was undergoing any process of amendment; for the headache was not removed, the nights were becoming more restless, the days spent in a state of torpor and somnolency, and there was deep sighing and many other marks of a typhoid state or of deficiency of nervous energy. The spine was examined, and one spot about the second dorsal vertebra found to be tender on pressure. A few days previously it was observed that the left arm and leg dragged a little, or were lacking in muscular power. The diaphoretics had made no observable change upon the urinary secretion. What was now to be done? The mode in which a fatal result was threatened—"the tendency to death"—seemed to consist chiefly of a low form of cerebral congestion, meningitis, or other morbid process in the encephalon, which might terminate by coma, convulsions or epilepsy. On reference to Dr. Bright's latest observations, we were strengthened in our conviction that it was in this way that the disease was likely to prove fatal. He says, "I have been able to trace the circumstances connected with the conclusion of life in seventy cases, and find that no less than thirty out of these seventy have died of well-marked symptoms of cerebral derangements, noted under the titles of 'apoplexy,' 'coma,' and 'epilepsy.' Eight others have died suddenly." A perusal of cases related by others, as well as those by Dr. Bright, had impressed me, previously to reading this numerical estimate, with the persuasion that a

termination by some head affection was the most common of all the consummations of this disease.

As derivatives from the head, and generally to alleviate any head affection, I kept up irritation by antimonial ointment on the back of the neck, applied a blister farther down the neck, evaporating lotions to the head, and ordered any kind of applications which would keep up the heat of the feet, which were becoming daily more affected with cold. Finding that too much company was allowed to see him, and that it increased his delirium and vigilance during the night, I interdicted it firmly—firmness is not unfrequently necessary. Venesection was suggested; but after consideration of all the pros and cons, my best judgment decided against it. Drs. Bright and Gregory are of opinion that it is chiefly in the commencement of the disease, if ever, that the abstraction of blood is beneficial. In later stages of the disease the countenance is usually pallid, as in this case particularly, from seven months bad health; and the system is daily undergoing the loss of albuminous matter by the kidneys, and on these and other accounts it seemed wise and proper to me to hesitate before venturing “to afford a temporary alleviation, at a still farther expense of the more nutritious and stimulating properties of the blood.” It might have been said with some plausibility, that as the head was painful, delirium was occasionally present, and the senses were becoming less acute, and that a slow inflammatory process was going on. But this might have been answered by stating the deficiency of other marks of an inflammatory condition, particularly of any excitement of the circulation, (the pulse being throughout slow, though full and firm,) or in the words of Dr. Bright, who says that this inflammatory process is greatly to be doubted, “as the symptoms, and many of the appearances after death, admit of a ready solution from the state of debility and anæmia to which the patient is reduced.” Nevertheless I abstracted a few ounces of blood by cupping from the region of the kidneys, and after one or two poultices, applied blisters. The best authorities prefer blisters, setons, or issues, to the abstraction of blood. Camphor and opium, four parts of the former to one of the latter, with a minute portion of ant. tart., seemed to soothe a little and reduce the delirium and sleeplessness of the nights.

The skin, which had been unperspirable for seven months, remained so, notwithstanding a flannel inner dress, blisters, and diaphoretics, internal and external. Unable in this way to relieve the kidneys, the quantity of albumen passing through was on the increase and the urine generally more scanty, my attention was directed to the means of obtaining from diuretics some alteration in their function; avoiding,

if possible, any detrimental excitement. I knew that the majority of the patients of Drs. Bright and Gregory who had recovered from attacks of this disease in some of its various forms, had used diuretics; chiefly supertartrate of potass, squills and digitalis. *A priori*, they appear of doubtful efficacy for good, and latterly Dr. Bright seems to employ them with more hesitation than at first, while Dr. Osborne condemns them. I ventured upon the administration of those above named in small doses, which increased the quantity of the secretion, with some relief to the increasing delirium, stupor and coma. But these latter symptoms made head notwithstanding, and he had almost entirely the appearance of one labouring under typhoid fever. The chances of recovery, small as they were deemed at first, were daily diminishing. For several days before his death he had about every day an attack of a convulsive nature, seemingly from obstruction to inspiration. For the last five or six days of his life there was little to be observed; low muttering delirium or coma filled up the whole history. For two days I had observed the pomum adami, or larynx, and upper part of the trachea very prominent, protruding nearly as far as the chin. The evening before he died I could see no observable change; the pulse was full and strong, and in this consisted the principal difference between my patient's symptoms and those of typhoid fever. In the latter part of the evening his breathing became more laborious, and shortly after midnight the painful history of his disease was closed.

Circumstances prevented my intended post-mortem examination, so that, to my regret, I am unable to subjoin a description of those morbid changes in the kidneys, and perhaps brain, of the existence of which there can be little doubt.

From the first complaint of difficulty of speaking and numbness of the cheek till the day of his death, there intervened about thirty days.

Clinton, Michigan, March 16, 1837.

ART. IV. *Case of Deformity of the Mouth, from a Burn, successfully treated by Dieffenbach's method.* By T. D. MUTTER, M. D., Lecturer on Surgery. [With a Plate.]

The following interesting case came under my charge the latter part of November, 1836. The individual affected was the daughter of a highly respectable practitioner of medicine residing in South