

taken up, or made away with, so much? Yet this they must have done, on the theory, so far as I understand it, that in diabetes there is no morbid formation of sugar but only a failure to utilise what is normally made. It is difficult to imagine but that in such cases as I have alluded to we have the making of too much rather than the using of too little. We must have over-production rather than diminished consumption and must look for some morbid exaggeration of the sugar-making process. It seems probable that the part of the tissues is passive rather than active and a morbid glycogenesis, in other words, the excessive making of sugar, the essential part of the disease. As this is often attended with a discharge of sugar more than equivalent to the carbohydrate which in ordinary circumstances we could suppose to be taken up by the tissues we must look for its cause in something more active than a failure on their part to seize the elements of nutrition which are presented to them. We have an active and destructive disease which is difficult to account for by a mere loss of assimilative power on the part of the tissues. We must have the creation of sugar, not the mere misapplication of it.

We fall back on the older view, practically that of Claude Bernard, according to which the immediate cause of glycosuria is in the liver, the remote cause in the brain. Much labour has since the time of Bernard been expended on the physiology of glycogenesis and the pathology of diabetes. Physiologically much has been accomplished, but in the field of pathology it must be admitted that much remains to be done. Not that nothing has been done but our knowledge in this respect is fragmentary and discontinuous: suggestive rather than conclusive. But it is impossible to ignore the connexion of glycosuria with cerebral injuries, of diabetes with mental disturbance, of saccharinity of urine with melancholia, and, to carry on the story after death, of evidences and consequences of vascular repletion especially in the brain in the shape of corpuscular extravasation and in the liver of abnormal congestion. The suggestion which these visible signs convey is of loss of contractile power in the arteries. The vascular leakage is not always to be found and therefore cannot be regarded as a necessary step in the establishment of the disease, but it is found often enough (blood in a recent state outside the vessels in eight of 22 cases) to point a moral and to insinuate that there is something generally abnormal in the pose of the vessels, though it is only in some that it has gone to the length of extravasation. Thus the hæmorrhages by transudation or rupture which are found in tetanus, chorea, and diabetes are not to be regarded as the cause of the symptoms or essential part of the disease but only as indications of some condition which is so. Granting that we have in diabetes signs of want of tone in the arteries, we are not to conclude that we have got to an end but only that we have taken a step in that direction; what it may lead to is as yet unknown. We have not discovered the *primum mobile*. Suspicion points to the brain, and in particular to the cortex and medulla, but we can at present go no further.

It is not to be assumed that diabetes mellitus is always the same disease or always due to the same cause. It may be due, as is now known, to pancreatic mischief. It is in touch with gout, which it sometimes replaces as if it were a form of gout, the articular symptoms absenting themselves in the presence of the glycosuria. Diabetes is often hereditary, as are some diseases which belong to the nervous system and some which do not. We have much to learn about gout and heredity and about the origins and kinds of diabetes; but whatever the future may have in store for us it can never abolish the experimental and clinical facts which associate glycosuria with morbid influences acting by way of the nervous system nor dissociate diabetes from certain disorders undoubtedly pertaining to the same system which, notwithstanding that they were, or still are, by some regarded as "functional," display signs of perivascular disturbance which forbid them to be so regarded if by functional is meant "without material change."

PS.—This paper, not quite a recent production, does not pretend to contain anything new but rather designs to take stock of the old, with such modifications and reassertions as time has made necessary. It is well now and then to look back and see where we stand, while we await further facts which the future cannot fail to provide

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SOME UNUSUAL EFFECTS OF MOVEABLE KIDNEY.

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MOVEABLE kidney is one of those curious affections which sometimes give rise to very serious symptoms and sometimes to none at all, and in which the gravity of the symptoms does not appear to bear any relation to the amount of the movement. It may form a tumour which descends into the iliac fossa whenever the patient stands up or coughs without causing more than a feeling of discomfort; or it may cause very serious consequences from pressing or dragging upon neighbouring structures, even though it scarcely descends sufficiently far below the ribs to be felt. There is a good deal of truth in the saying that a kidney which simply descends behind the peritoneum and fascia which cover it in front may become the seat of hydronephrosis from kinking of the ureter, or of tubercle or calculus from being repeatedly bruised, but it will not, as a rule, interfere with other organs, while one that simply tilts forward without descending to any great extent, even if it is only the upper end that tilts, may lead to very grave inconvenience and give rise to the suspicion that the patient is suffering from disease of some of the neighbouring organs. Fortunately, the diagnosis rarely presents any difficulty. Whatever the nature of the symptoms to which a moveable kidney gives rise, whether they are those of ulcer of the stomach or of gall-stones or of inflammation of the appendix, there is one test which enables the true cause to be distinguished at once and almost without fail. Symptoms that are due to a misplaced kidney are relieved and in most instances disappear entirely as soon as the patient is placed in the recumbent position. When they are due to organic disease of other organs change of position has little or no effect.

In one case under my care a moveable right kidney gave rise to a series of symptoms resembling very closely those ordinarily present in chronic gastric ulcer. The patient was a married woman, 44 years of age, who had had nine children, six of whom were living. For the last 20 years she had suffered from pain in the epigastrium, shooting round to the back and shoulders. The pain invariably came on from a quarter to half an hour after meals. Solid food made it worse, vomiting was frequent and was rather encouraged as it relieved the pain. Scarcely a day passed without at least one attack and for the last nine months there had been no respite. 21 months ago there had been three attacks of hæmatemesis, the amount said to have been as much as three quarts, and there was melæna at the same time. The abdomen was large and flabby. According to the patient's account she had been getting thinner. The stomach was not dilated or displaced, the lower border being situated about two inches above the umbilicus. There was a little tenderness on deep pressure to the right of the epigastrium but no tumour could be felt. Both kidneys were moveable, the right one in particular descending so far when the patient strained or coughed that it came quite below the thorax and the hands could be made to meet above it. While in the ward lying in bed waiting for operation the vomiting, which had been more and more troublesome and which was the immediate cause of her seeking admission, ceased entirely and the pain after food diminished so materially that it scarcely interfered with her comfort. This led me to the conclusion that the mobility of the right kidney was the chief, if not the sole, cause of her symptoms, whether it acted mechanically by dragging upon the duodenum and pylorus or whether it irritated the splanchnics in some way, leading to persistent congestion of the mucous membrane of the stomach with its attendant consequences, chronic gastritis and hæmatemesis. The right kidney accordingly was exposed through an incision in the lumbar region, all the fat around was removed, and three kangaroo-tendon sutures were passed through it, securing it to the wall. Iodoform gauze was packed around the outer border and lower end of the kidney to prevent any strain falling upon the sutures during vomiting and to

secure fixation by adhesion afterwards and the wound was closed. The subsequent progress does not need any description. The patient was kept in bed until the wound was soundly healed and then allowed to get up, wearing an abdominal belt as a precaution. There were occasional attacks of dyspepsia afterwards, but so far as the severe pain and vomiting were concerned relief was complete.

In two other cases under my care about the same time the effect of the displacement of the kidney fell not so much upon the pylorus as upon the gall-bladder and the common bile duct. One of these patients was a young woman, unmarried, 26 years of age. The other was married, with a large family, and probably was a little over 40 years old. The history they gave was practically the same, so far as important details were concerned. In both there had been repeated attacks of colic beginning in the right hypochondrium and resembling mild attacks of biliary colic but bearing little or no relation to food. They did occur after meals, it is true, but they occurred almost as frequently at other times. At night they rarely occurred. In the elder of the two these attacks had lasted a good deal longer and were more severe than in the younger. In her, too, they were often attended by jaundice, which, however, rarely lasted longer than two or three days. Occasionally there was sickness, but it was not sufficiently regular or frequent to enable it to be said that it was dependent upon the colic. There was tenderness in the right hypochondrium in both, especially after one of the attacks. The liver was not enlarged and no tumour could be felt when the patient was lying down. When standing up and leaning forwards, supporting the weight of the upper part of the body upon the hands so that the abdominal muscles were relaxed, a sensation of deep resistance was felt over the region of the gall-bladder, especially in the case of the elder patient, but the gall-bladder could not be defined. The elder of the two volunteered the statement that if she could only get to bed and lie down for a few hours the pain almost ceased and that very often it returned after she had been up some little while. The lower end of the right kidney could easily be felt in both when they were standing upright but it was not moveable in the ordinary sense of the term—that is to say, though it descended distinctly when the patient took a deep breath it resumed its former position as soon as the pressure of the diaphragm was taken off.

All kidneys are moveable. In a good many people the upward and downward range of movement is more than an inch and may be as much as two inches. When such a kidney is placed rather lower down than usual, owing perhaps to a long narrow thorax, it can easily be felt and may be mistaken for a pathologically moveable kidney. This term, however, should be reserved for kidneys which not only descend but which fail to re-ascend spontaneously when the diaphragm relaxes, and which do not regain their natural position unless either the patient lies down or some external pressure is brought to bear upon the abdomen. In neither of these patients was the kidney moveable in this sense, but for all that I have no doubt that it was the cause of the symptoms of which they complained by the way in which it pressed upon the cystic or perhaps the common bile duct. At least it is certain that after the kidney had been exposed and sutured to the posterior wall in the way I have just described they were both completely relieved. The explanation is, I believe, to be found in the kind of movement the kidney undergoes in these cases. In ordinary ones it glides up and down behind the peritoneum and does not come into relation with the bile ducts. In these the lower end appears still to retain what attachments it has and the upper end drops forwards, so that the kidney assumes a horizontal rather than a vertical position. This form of displacement was, I believe, first described by Potain who spoke of it as anteversion of the kidney, and he, too, considered that it was in some way related to what may be called, for the sake of brevity, biliary symptoms. Potain, however, appears to me to have mistaken cause and effect. According to him irritation about the biliary passages leads to a general relaxation of the serous and subserous tissues in their neighbourhood and this in its turn to loosening and displacement forwards of the upper end of the kidney. It seems to me more rational to regard the displacement of the upper end of the kidney as the primary cause and the temporary closure of the bile ducts as the consequence.

Cases in which similar symptoms have been caused by complete downward displacement of the kidney have been recorded by Dr. W. Hale White and Mr. W. Arbuthnot Lane,¹ and also by Dr. T. J. MacLagan and Sir Frederick Treves,² but, so far as I am aware, no one hitherto has associated them with simple anteversion, a condition which probably is much more common than is usually suspected. I may add that neither of my patients could have been accused of the smallest degree of tight-lacing, which has often had the credit of causing these symptoms, nor was there any suspicion in either of them of general enteroptosis or rotation of the liver.

A third case presenting closely similar features was under my care about the same time. It differed, however, in one important respect, for the kidney was much more moveable and slipped down in the usual way when the patient stood upright and coughed or strained. What the immediate mechanism may have been in this case is not easy to say, for the kidney when it glided down appeared to lose all relation to the biliary ducts. It is possible that there may have been some adhesions between the gall-bladder, on the one side and the hepatic flexure of the colon and the other structures, which must be displaced to some extent when the kidney descends, but the patient refused operation so that I am not able to speak more definitely.

Inflammation of the appendix is another trouble which I have known on several occasions to be simulated very closely by moveable kidney. A short time since a patient, a young woman, unmarried, 24 years of age, was sent to me because of a swelling which had made its appearance in the right iliac fossa. It had been diagnosed quite correctly as a moveable kidney but the symptoms of which she complained bore no relation whatever to the kidney but were exactly those which are present in an ordinary case of mild inflammation of the appendix. Whether she had been reading the subject up or comparing notes with friends who had suffered from genuine inflammation I cannot say, but the recurrent attacks of colic, with constipation and abdominal tenderness, brought on by exercise or by trivial indiscretion in diet, were so accurately described that I was led to examine her appendix and found it perfectly healthy. Instead of removing it I proceeded at once to suture her kidney into its place and from that date the symptoms disappeared. In connexion with this case I may mention that on another occasion I removed a calculus, fixed in the cortex at the lower end of the right kidney, in a man who had already had his appendix removed for recurrent attacks of colic without experiencing the slightest relief. What may have been the condition of the appendix at the time of the operation I cannot, of course, say, but certainly the pain which led the man to undergo both operations was due to the calculus, for it was not benefited by the first and was completely removed by the second.

The difficulty of forming an accurate diagnosis in these cases is made considerably greater by the well-known fact that moveable kidney and inflammation of the appendix are not infrequently associated together. So commonly, in fact, do they occur together that it has been suggested that there must be some causal connexion between the two. The reason that is usually assigned is the pressure of the displaced kidney upon the mesenteric veins. This would lead to chronic congestion of the mucous membrane of the appendix and would in this way render it more susceptible to the septic organisms which are the immediate cause of all such attacks. But I am not aware of any case in which this has been proved and as a rule the kidney, when it comes down sufficiently far to press upon the mesenteric veins, enjoys such a range and such freedom of movement that it would be hardly likely to press upon them for a sufficient length of time to produce this result.

There is no doubt that moveable kidney is a much more common affection than is usually believed. It has been said, and it is probably correct, that the range of mobility is pathological in 10 per cent. of women. In a very large proportion of these cases the patient knows nothing about it and should be left in happy ignorance of it. It causes no symptoms worth mentioning and needs no treatment. But there is a small percentage, amounting, however, in the aggregate to a very large number, of which this is not true. Independently of what may be considered to be subjective symptoms they suffer very commonly from gastric and other

¹ Brit. Med. Jour., 1892, vol. i., p. 223.

² THE LANCET, Jan. 6th, 1900, p. 15.

troubles, which are often put down to simple dyspepsia, but which I cannot help thinking are in many cases due either to complete displacement of the kidney or to that much more insidious anteversion which can only be ascertained by examining the patient in the position I have described. Such cases can be cured by early operation.

Unfortunately, if matters are allowed to drift on, definite organic changes may be induced, either directly in the structures concerned or indirectly through the medium of the nervous system and these may perpetuate the symptoms, even after the original exciting cause has been removed.

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ANKYLOSTOMIASIS IN WESTPHALIA, HUNGARY, AND CORNWALL.

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FOUR months ago, in conjunction with Mr. Hermann Belger of the Durham College of Science, I visited the coalfields of Westphalia and Hungary with the object of studying ankylostomiasis, of learning something of the social, industrial, and medical conditions under which mining operations are conducted there, and of contrasting these with those found in Cornwall.

We chose Bochum in Westphalia as our vantage-ground, for not only is it the most important mining centre of Westphalia, also that where the disease commenced and has been most severe, but it is here that Dr. Tenholt lives who is recognised as the principal authority on ankylostomiasis in Germany and who is the medical head of the Knappschaftsverein, or Miners' Assurance Union, with its 265,000 members. At the Elizabeth Hospital, Bochum (400 beds) on the date of our visit there were 30 patients in the institution suffering from the "worm disease" and of these 19 were convalescent. The men who are afflicted with this malady are kept in a part of the building separate from that reserved for the other patients; they have their own set of lavatories with annexa for the examination of fæces. Dr. Nagel is in charge of the bacteriological laboratory at the Elizabeth Hospital. Here we were joined by Dr. Tenholt. It is at the Elizabeth Hospital that the most important pathological investigations are carried on. Courses of clinical and pathological instruction are given in the hospital by Dr. Tenholt and Dr. Nagel. The former has already had through his hands 300 young practitioners who, after their special training, have been sent to the mining districts to combat the disease. In our visits to the Lothringen and Erin mines in the neighbourhood of Bochum we had the privilege and the pleasure of Dr. Tenholt's company and I take this opportunity of thanking him through THE LANCET for his valuable assistance ungrudgingly given.

It is impossible otherwise than to admire the well-thought-out plans and the means adopted by the German Government and the Miners' Association to stamp out the disease. Before a new workman is taken on at any mine in Westphalia he must proceed to one of the hospitals, defecate there, have his stool microscopically examined, and receive a certificate of health from the medical officer, and for this the miner pays 1s. It has been found necessary to make the miners pay for the medical certificate as it prevents them moving about from one mine to another; also the authorities have been obliged to enforce personal attendance at a hospital of the applicants for work, as the men used to bring for microscopical examination not their own but the fæces of their wives and children.

"The spread of ankylostomiasis through Westphalia is attributed to the rapid opening out of the mines during the last few years. So great was the demand for coal a short while ago that in one year 20,000 new miners had to be introduced into Westphalia. These men came from Posen in East Germany, Poland, and Italy. At the present time Italian miners, if they pass the medical officer, are accepted but Hungarian miners are not engaged upon any condition. How the disease was imported into Westphalia it is difficult to say but it has been an expensive item for this part of Germany. Ankylostomiasis has cost

the Miners' Association little short of £200,000. For each report of a case of ankylostomiasis furnished by a medical man the association pays 1s. This includes payment for a microscopical examination of the stools which in all instances must be made. One medical man examined 8000 cases a short while ago and received £400 for examining and reporting upon the same. Owing to the Westphalian mines containing a good deal of coal dust and explosive gases spraying with water was made compulsory by the Government three or four years ago. Since watering the mines the number of cases of ankylostomiasis has materially increased. According to the *Deutsche Bergarbeiter-Zeitung* the number of miners in the valley of the Ruhr—i.e., the district above mentioned—who have suffered from ankylostomiasis is as follows:—

1896	1897	1898	1899	1900	1901	1902
107	113	99	94	275	1130	1355

As a supplement to this I reproduce in full the table which appears in the report on ankylostomiasis of the Special Commissioner appointed by the *Colliery Guardian* and published in 1903, an excellent report, by the way, and one full of interesting information. The total staff employed in the 289 mines in the district in 1902 was 256,000.

Year.	Number of pits infected.	Number of cases reported.	Proportion of cases per 10,000 miners in work.
1896	15	107	6.4
1897	31	113	6.2
1898	23	99	4.9
1899	26	94	4.4
1900	40	275	11.7
1901	63	1030	40.6
1902	66	1355	52.9

It was in 1900 that compulsory regulations for watering mines in Germany were introduced. The sudden rise in the returns of cases about this time is more than a coincidence. As indicating a causal connexion between sprinkling the workings in the mine with water and ankylostomiasis the figures published by the Miners' Association are of importance. In 1901 of 63 infected pits there were 57 in which spraying with water was being carried on and in these there were 1021 cases of ankylostomiasis, while in other six infected but unwatered pits there were only nine cases of the disease.

In 1902 the number of men suffering from ankylostomiasis in Westphalia was simply alarming: in the Erin coal mine there were in 1902 297 patients, in Graf Schwerin 296, and in the Shamrock pit 258.

At the Lothringen mine there are at present 2000 men employed, of whom 1600 work underground. Ankylostomiasis broke out here in 1885. Two years ago 72 per cent. of the men working underground were suffering from the miner's worm disease; to-day only 8 per cent. Down the pit I found every 300 yards or thereabouts earth closets or portable pails for the use of the miners. These pails which were made of galvanised iron were found usually in very accessible places, were surrounded by sacking and thus were partly screened from view. At other places these pails were placed in recesses in the rock and screened off by sacking. The ground immediately around was strewn with lime and crushed stone. Here and there by the side of the main ways in the mine were pools of stagnant water or heaps of slimy mud rich in the ova and larvæ of the ankylostoma duodenale. The larvæ of this intestinal parasite attack the timber props of the mine, causing them to be wet and to become rotten. According to Dr. Tenholt the larvæ seldom ascend higher in the wooden props than one yard from the ground. In one of the sideways in the mine which was infested with the larvæ we had the opportunity of seeing some experiments carried out by Dr. Tenholt—viz., sprinkling the mine with a watery solution of quicklime. Preparatory to this being undertaken infected miners were asked to defecate in this particular gallery, the temperature of which is rather high, and in 14 days owing to the favourable temperature the ova had become changed into larvæ. This is the average length of time in the mine for the development to occur.

At this point I may incidentally remark, since I shall not