Thesis
on
Diabetes Mellitus

by
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History of a Case of Diabetes Mellitus.

Until recently the pathology of diabetes was but very imperfectly understood, and its symptoms and accompanying phenomena were therefore largely explained by various theories. There is still much about it to be cleared up, but it is classed among the incurable diseases, and there is still plenty scope for theory and speculation as to the real nature of this important disorder. But with physiology and pathology advancing with such rapid strides, what is as yet almost dim may, at no distant date, be expected to be made clear, one disease more removed from the list of incurable be added to that of curable diseases.

I am induced to make the following case of diabetes which came under my observation, the prepare to my thesis as it was thought at the time the very interesting as well as instructive.

Mrs. D., at 46, a housekeeper in a платеман family in the North, was admitted into Grey’s Hospital, Elgin, towards the end of last summer, suffering from an attack of diabetes mellitus. She was a large, stunted woman, clothed much better than she was used to, her hair having been for several years perfectly white. Her attention was first drawn to the state of her health a few weeks before admission.
— from her excusing thirst, avoiding large quantities of wine. In omission she presented all the usual symptoms of a diabetic attack, passing from 8 to 9 pints of wine in the day, of the specific gravity 1.045, & when tested her urine in some the characteristic reaction. Her appetite was not very ravenous, but her thirst was extreme & her urine of a very yellow appearance. The news, moreover, afflicted with a most intolerable itching of the anus & the orifice of the urethra, which had a raw irritable appearance. She was put on an animal diet, with an allowance of the vegetables usually recommended. Gluten bread was procured for her, & for drink she was allowed 8 or 10 oz. of lime water in the day. She had also XV scr of hyoscine before meals. Quinine was likewise given, but in her case it may had the effect of malting, more thereby. Her months were punctuated during the eighth. To relieve the itching of the perineal organs, a lotion composed of hydrocaine was applied, with great relief to the patient. This treatment was persisted in for some short time, with the effect of reducing the specific gravity of the urine only to 1.040. Cod liver oil was administered but from it no remitting effects could not be percieved with. Carbonate of ammonia & the other alkaline carbonates were substituted for the lime water, but
without any beneficial result. Thus with an animal diet, from cattle (the pithen head having become chlorinated),
the vegetable, usually allowed, 90° XV of saltpetre before meals together with the alkaline Carbonates, rarely sometimes with
lemon water, for about, the lowest point to which the urine
could be brought in Dr. Pr. was 1.036. Long at that time
upon Remond's theory that sugar was a natural secretion
of the liver, that in this case there was more elaborated than could be accomplished by the oxygen of
the lungs, Chlorate of Potas was given in place of
the alkaline Carbonates, as it was anticipated that the
salt from its containing such a large proportion of
oxygen, might have the effect of oxygenating to a
greater extent, the surplus sugar. In prescribing it, the new
theoretically adopted, as there was no indication of pulmonary
disease, there might be supposed to interfere with the
elimination of the sugar. Whether it be here explained
in these words or not, it certainly had the effect of
recovery the Dr. Pr. of the urine to 1.030. Thus
this was not a mere coincidence is proved from the
fact that it was given at the same time to another diacetic
patient in the hospital, with a little saltpetre, lowering
the specific gravity of the urine in his case from 1.038
to 1.034. This fact sustained in variable quantities 9
water economy. The tube of the patient was administered for a short time, commencing with one dram, gradually increasing the dose to two or three drachms per day. During the time the Chlorate of Potash was administered, the average specific gravity of the urine was 1.032, the thirst was much less, the apple-taste was not nearly so keen, and the irritation about the genitalic dis- appeared in a great measure. At length, however, the sp. gr. of the urine rose to 1.034, sometimes 1.036, but seldom more, the salt at last becoming partially distasteful to the patient, its use was suspended. These were another curious feature in the case. Towards the end of autumn, a large phlegmonous abscess commenced to form in the groin. During the time it was in progress, very purulent, the urine was found to be as low as 1.020 in sp. gr. and during the whole of this time—about a month altogether—it might have been said to quite well. Experiencing little or no thirst, the hankering about the normal quantity of urine in the day. There was still, however, a very perceptible trace of leucor- in the urine, which, being also examined from time to time under the microscope, was found to be crowded with oxalate of lime crystals. It may be asked, how were the crystals of oxalate of lime present in such abundance, there being at the same time very little leucor in the urine? Did they take the place of, or were formed from
The sugar, in these cases, that in the urinary bladder, exudes of urine is believed developed from the malabsorption of the diuretic elements of the food, or again was there any absorption of ferment matter from the large intestines, phlegmonous soil, which might be supposed to act as a ferment, transforming or decomposing the sugar in the circulation. Thus it was one of these phlegmonous abscesses that sometimes accompany this peculiar disorder. There was little doubt, but it was held that the almost entire absence of sugar from the urine was somehow or other connected with the presence of this poison, and that a very few cases were effected. It may be that this was a case of what writers call "intermittent diabetes." Thus the presence of the abscess was a mere coincidence during this intermittence. At any rate it was assumed that the great improvement in the condition of the patient, he was invited on the absorption of ferment matter, which acting as a ferment decomposed the sugar in the system. A fetor was therefore noticed over each kidney of the other patient in the hospital, with the idea that the absorption of pus might be effected from the thus artificially produced suppurating surface. This patient, however, was in such a weak and reduced condition, that without any impact or prominent symptoms, he died.
on the fourth day after its mention, no doubt from the irritation caused by the presence of the foreign bodies, the diabetics were very intolerant of any surgical interference. This arises probably from their basal powers being so much lowered by the disease and they are then fore unable to stand any shock to the system.

In the other patient, whom as the abscess showed any indications of healing, the urine commenced to rise pari passu in specific gravity, distinctly by the time it was completely healed, it stood at 1040.

Entertaining the notion that as sugar was formed by the liver, that it was destined according to Pernard for immediate destruction in the lungs, that the excretion was in excess and could not altogether put off by this process, or that the excretion being normal the lungs were at fault and could not discharge of all the sugar which was brought to them, attention was now directed to these organs to ascertain, if possible, whether anything abnormal could be made out regarding them. The lungs as before mentioned alone were healthy, but presenting no optical evidence of tubercular deposit, but the liver by persevering that potassium was found the delayed somewhat beyond the normal limit, and the patient complained of a this
agreeable feeling "of tightness & drawing up" in the right hypochondriac region. She had also been very subject to attacks of what she called "lumbousness" preceding to the diuretic declaring itself. I would here remark that diabetic patients have in several instances, whatever may be the reason of it, been subject to this said "lumbousness" before the commencement of the disease, at least I have always found in the cases reviewed that lumbousness is often mentioned in the previous history of the patient. There is obviously some previous derangement of the hepatic junction, that this has something to do with the development of the disease, is probable, but I will defer referring more fully hereafter. Long before she had any apparent symptom of diabetes she was afflicted with great irritation of the external genital organs, accompanied with itching of the skin, we may connect this cutaneous affection with the derangement of the hepatic junction referred to above. When we consider the sympathy that exists between the brain and the liver under the influence of an elevated temperature we may possibly find an explanation of this in the fact that the patient in the discharge of her duties, had to superintend the culinary operations of the family in alone service. She was, therefore, the
The iodine was necessary to treat external lacerations. Falling the hints from Professor D'lace of Edinburgh, who found all his diabetic cases by means of iodine (Edin. Med. Journal, Nov. 1855) this substance was now tried, as from its known action on the skin, in accordance with the Permanente theory, reasonable hopes were entertained that it would be attended with some benefit to the patient. The form in which it was administered was the liquid iodine. Comp. of the London Pharmacopoeia. Commencing with the dose of 10 drops gradually increasing it to 30 drops three times daily, this treatment continued the patient for about three weeks without producing any symptoms of intoxication, though taken in such large doses. During this time there was an improvement in the condition of the patient; the urine fell almost from excess with Dr. She expressed herself as feeling more comfortable. Her thirst was certainly not nearly so great, and the urine passed was less in quantity. I am unable to say what effect the iodine might have ultimately produced, if it had been continued long enough, as at this time the patient went for change of air to an adjoining County; I was therefore beyond my observations.
For this reason the urine was withheld for fear of producing any untoward constitutional effect.

There are several points of interest in this case. The way the very marked improvement in all the symptoms from the use of the carbonate of potash, which it was presumed was due to a certain extent the excess of leucin in the circulation. There was also an almost complete return to health, so far as the calculus was concerned, on the formation of a polyhymeno-atelus in the prin, with the specific gr. of the urine down to 1'020, & an immense deposit of oxalate of lime crystals. That the remission depended on any effect produced by the abscess, may be considered doubtful, still so long as the suppuration was going on, the patient was very well, & as soon as showed indication of healing up, there was a pronounced return of all the former symptoms, with the almost entire disappearance of the oxalate of lime & the bile in the urine, monitored up to 1'040.

In considering the pathology of this disease, there are many difficulties the encountered, arising from the fact that the proper physiological function of the liver are not as yet fully ascertained, believing as I do, that the spot of the disease lies in
This view, that a more extended knowledge of these functions will ultimately lead to the true pathology of diabetes mellitus.

The splendid discovery of Bernard that sugar was formed by the liver, and that it was destined for immediate destruction in the lungs, was a great step in advance, by giving us a glimpse into the probable nature of diabetes, viz., that the sugar was formed in excess, not being eliminated by the lungs, was then carried into the circulation, acting powerfully, as a diuretic, carrying with it the principles of life, leading to maceration and death. Further researches, however, into the physiopathic function of the liver, have tended to overturn this theory, which was simple, ingenious though, but which suggested to us nothing practical in the way of treatment, except this, that since we animal, saccharine or vegetable food still sugar continues to be formed in excess (though in different quantities in each case), that being unacquainted with the particular process, whereby it was eliminated by the lungs, we could do very little to assist them in their destructive operations.
Researchers recently instituted by Dr. Parry (Lays Debates Reports, 1858) go below that the healthy liver during life does not secrete sugar, and that the sugar which had hitherto been found in the liver on the right side of the heart was merely a post-mortem change of the natural secretion of the liver. This liver material he calls hepaticine.

This substance is not formed for the purpose of being converted into sugar of which only the merest trace is found in the right side of the heart during life. The facts and experiments which he brings forward in support of his statement clearly demonstrate that a glucoplastic function cannot be assigned to the liver, and consequently that the theory which supposes that the liver initiates fail to eliminate the sugar formed by this organ can no longer be tenable, as representing a state of things which does not and cannot exist.

In attempting to explain the pathology of diabetes, in conformity with the more fully ascertained functions of the liver, some other theory must be advanced, which supposes that owing to some abnormal condition of the hepatic organ as well as of the blood, this hepatic undergoes a certain transformation, and owing to some liver,
it is true, formed from the food during digestion, as according to Bremund, the gastric and pancreatic fluids possess the power of converting starch into grape sugar. If we feed a healthy man on animal food to the exclusion of all starchy substances, as in the experiments of Dr. McEuen, no sugar will be found in the contents of the stomach during digestion but if we subject a diabetic patient to the same treatment, cutting off every source, wholly sugar or any substance capable of being converted into the same, weightless, conveyed into the stomach, then examine its contents where in a state of digestion, sugar will be found. From this arise the theory that the sugar in sugar was formed through faulty digestion of food. But the presence of sugar under this condition can I think be explained from the fact that the whole system in diabetes is saturated with sugar. There is sugar in the urine, in the blood, in the saliva and the faeces. The secretion of the stomach, may therefore be reasonably supposed to have in the general nutrition, so that the gastric juice will contain it, even when the source is cut off alle ejecta.
I incline to the opinion that diabetes is a disease which will be found to occur more frequently among the higher classes, or among those who like their overfed themselves and are given to idleness, than amongst the lower class. We do not often find cases of diabetes in a public hospital, or among the poor. If it be any proof of this opinion, I may state that all the cases of diabetes which came under my notice during the last eighteen months belonged to the former class. They were poor in number, one was an invalid in very easy circumstances, the other three were servants in families belonging to the higher rank of life, where from their living in rather elevated positions in the same, we may suppose that their work was light, their food was heavy.

Excess in the kind and quantity of the excreta may favor the development of the disease. Starting with the facts, that as clearly shown by the experiments of Dr. Pavy, whenever the hepatic comes in contact with the blood or the liver tissue, when the saliva, it is immediately converted into sugar (the slight trace of sugar which is naturally found in the right side of the heart, being probably due to a little transudation of the liver materia into the...
circulation) and also that particular kinds of food affect not only the quantity of the hepaticine in the liver, but also most materially the size of the organ itself, we may venture to propose the following theories as affording a possible explanation regarding the condition of diabetic patients:

1. The quantity of the hepaticine may operate in producing diabetes. Vegetable diet alone is found by Dr. Pavy's experiments to increase the size of the liver and the quantity of hepaticine secreted, in relative proportions, to twice the extent as when a purely animal diet is given. When mixed with sugar, an animal diet produces nearly the changes in the liver, as when a purely vegetable diet is given. It is reasonable to infer that the same changes which are found to occur in the lower animals will also be produced in the human subject, and that as a result of these changes in the condition of the liver, a state favorable for the development of diabetes will be present, so long as the liver is increased in size and the hepaticine in quantity. Moreover, a saccharine state of the urine was observed in several days, that were fed on a mixture of animal food with sugar.
clearly, that the quality of the food led to an abnormal condition of the liver, whereby the presence of sugar was determined in the urine. In fact, the kind of diet is mentioned by some authors as being one of the causes of diabetes - thus Dr. Campbell, relating his own experience of the disease (reprinted from the Medical Chirurgical Transactions) states that before it commenced he lived "hirsut", and in consequence was much prone to "rice, fruit &c. He also refers to other two diabetic patients, who had been "great bread eaters." It is more than probable, therefore, that what may be called the too carbohydrate quality of the food will induce certain conditions giving rise to diabetes. Now what may these conditions be? Under the influence of too carbohydric and saccharine a diet, we have the liver abnormally enlarged, directing hepatic blood into the liver, matter in proportion to its increase - increased size corresponding to increased function, with that it is in a state of fermentation and chronic congestion. In diabetes, says Dr. Stothers, "it is almost always hyperemic and inflamed." (From Fred. Crown. Med. 1858). As a result of this hyperemia a congestion, we can conceive that there is an escape escape of the hepatic from the hepatic cells (which are actually detaching - have detached with this material)
into the blood, may be occasioned, by which it is at once converted into sugar. "Compression of the liver, as in violent struggling, will naturally tend to occasion an escape of the "contents of the hepatic cells into the circulation. Again "narrow obstruction of the breathing, the right side of the "heart becomes forced with blood, the whole nervous system "compelled. By the retardation in the flow of the blood, "the pressure to which the liver is submitted, "there is produced an undue admixture between the "contents of the liver cells and blood vessels. A trans- "fusion of liver material into the blood will immediately "occasion the presence of sugar." (Buys's Medical Report) "or the liver may be supposed as in a state of chronic "mucous injection, much alike, or some of the true inflams "matory process, whereby it may be supposed (if not "confirmatory to the rules of all true pathology) that a degree "of nerve transmission from the capillaries will be produced, "leading to an undue admixture between the contents of the liver cells and blood vessels.

In either case sugar will be formed, probably by a "chemical transformation. The liver by a vital "action selects and absorbs the saccharine elements "of the food, assimilating them as hepatic, which "again by a process of deoxidation is converted into "sugar. Thus it is through the agency of the bile that
This alteration is effected, is more than likely. This sugar is formed from starch, hepatica to a great extent from sugar, &c. from hepatica. Hepatica from its facility of being converted into sugar, must be very similar to the latter body in its Composition. As bearing somewhat on this point, Sir W. Lee expresses a letter in his notice of what Dr. Clapier mentions (in his Pract. of Phys.) as “a curious circumstance” serving “to show the connection between albuminous & saccharin acid.” Dr. Bartlet had laid back during the winter season “a quantity of diabetic extract, gummar, &c. half-evaporated, not dissimilar to fine leaven sugar.” It was left encased in several packs of paper in a closed room. In examining it at the end of the winter season, the extract was much diminished in size, had lost all appearance of sugar, was of a very viscid consistence like half-melted gum, that acquired a sweet smell. “Dr. Bartlet ascertained that it was no longer saccharin, but was converted into a substance like coagulable albumen.” Dr. Clapier is much puzzled, in regard to this so-called conversion of sugar into albumen, &c. This paper whence came the nitrogen of the albumen, was in the principle that a little leaven leaveneth the whole, he supposes that
sufficient to effect the metamorphosis of a little area had been left behind in the extract. It will be very probable that this was a mixture of the decomposition of sugar into hepatic, from which it had been formed, especially in the physiological properties of the transformed substance. The effects close with the time arrived to hepative in an unripe state by Dr. Parry. Besides, as according to Bernard, hepatic is void of vitriole, all speculation referring to products there useless is unnecessary.

Cattle, simmered, cold fluids where the liver is in a state of heat temperature, or a bit of interpenetration are mentioned by authors as effective causes of the body.

There may operate as much eruptive causes, producing a higher place of congestion in the liver, already free disposed to its being affected in this manner, from its disposition caused by the quality of the injecto, which can move as much of the hepatic than blood will be occasioned.

2. The quantity combined with the quality of the injecto may give rise to the convulsion favorable for the development of diabetes.

Dr. Parry is of opinion that the quantity of the food does not to any significant extent occasion an increase in the size of the liver, or the hepatic present.
The time allowed to determine the point of life expressed in animals on the lower was probably not sufficiently long. At any rate, it may, I think, not only be shown that the humidity, together with the quality of the food will affect the state of the liver in another way, but also that an increase in its life may not be necessary, even for the production of diabetes. A full Longer, more of living along with an inactive state of the body, will of course increase of the liver tend to occasion an increase in its life. "Since the food be too abundant, too rich, the liver will not do any good. The same matter, this amounts to a deficiency of oxygen." (Gregory - Organic Chemistry.) Again, "When oxygen is deficient, combustible matter accumulates in the blood beyond the due proportion, & the liver is called on to work beyond its limits in secreting bile, forming gelatin, the fibrous tissue, &c., as we see in hot climates, where people are in full feeding, the respiration is changed." (Gregory.) Thus we will have a perpetual alimentic condition of the liver from excess in the quality of the food, as from accumulation of effete matter in the blood. Consequently in the depleting of oxygen, its function will be increased, increased function leads to increased age. The quality of the food to it is containing a large proportion of carbohydrates.
or mechanic elements, will assist in lessening about
this condition.

The liver being thus exercised is taken on a depletive
acting, so to speak, we may have this result actually
produced on the application of very exciting cause, as call
or interference. Enlargements a constitution the liver
will, therefore, depend on a faulty state of the second
ary as well as the primary affection. The causes
causing other result may possibly take longer time in
their operation, than those having for their origin the mere
quality of the injure (?).

It is allowable to go further than this; it is also true
that the conversion of hepatic into lepomol effects
when a somewhat different pathological emotion
of the liver, when overstimulated in that re-act of
an excess of effete matter in the blood than that which

Thus the bile plays a most important part in
the conversion of hepatic into fat, as Sharr
already said. Most probable
Now when effete matter accumulates in the liver, the
liver is unnaturally stimulated in setting at rest of the same
it is reasonable to infer that the organ is in a
state of deformed nutrition, thus its filtering function
is impeded and in consequence fails storing album
the change whereby the hepatic is accumulated as fat, and that the hepatic arten, the circulatum unchanged at once becomes dry. he can thence see how it may be that an increase in the size of the liver is not so much a necessary condition for the de-velopment of diabetes, as that, from its being a blood disease sooner or later, the bile being an excretant as well as a secretion, is discharged with bile-purate, which, there is a subdivision of its just forming fraction, there may be a diabete as well as an acid of ace acid diabetes, which, a preadaption to it had existed before the exciting causes came into opera-tion. if this may be so, it can be seen how in some instances it has been known to be hereditary or attacks members of the same family. a probable explanation may also be thus afforded of the connectin that is sometimes found to subsist between diabetes and calculus. by referring this last complication to an abnormal state of the secretory desposition differentiation by the habits of the individual, which mean in this - that for the most part, even amongst the neglected diabetic, in fact amongst the same class of persons, who shone diaphoresis are most commonly affected with diabetes. as Dr. Watson says (first of physic) 'in the London
Habitats it is not very uncommon for us to meet with the fact, but that is in persons who have lived fully sinuously, in the abounds of wealthy families, for instance, butlers, coachmen, footmen. (One has the liberty of mentioning that of the four cases of bilest, which came under my notice, one was a butler, the other a coachman in "wealthy families") "men who often live more luxurious and none of a great deal than their masters."

In fact there is in the blood a residuum of digestive matter, which cannot be got rid of by the excretions of the body. The great excretory function, by which the products of the secondary assimilating process are to a great extent excreted, is largely employed, in leading the function by which the

"There is a manifest change in the function of the hepatic secretion" the function of digestion, the hepatic urinary secretion are much decreased; the hypochondriac regions, especially the right, are the seat of a sort of pain, free tension, unweasiness." Anji (Text of Physic). The affinities between bilest, foot and calculus are probably thus she explained. "Though the food may be of abundant constellations, in conjunction

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Matter this amounts to a deficiency of sugar; and at the same time there be a deficiency of allal, necessary to promote the oxidation of the waste matter in the blood, we have the urea acid uricurin, or with a little more oxygen the oxalic acid uricurin. (Gregory) According to the theory, which have been broached regarding the nature of diabetes, many attempts to divide it into two varieties, depending on causes somewhat different.

1. Diabetes may be a result of the quality of the blood of the vessels, which being too angry, cedos or carboanim in urine will tend to occasion an increase in the size of the liver and facility of its hepatic. This pifelonic phlegmastic condition of the liver is liable to be altered with a transudation of the contents of the hepatic cells into the blood, by which the hepatic is at once converted into sugar.

2. Diabetes may be the effect in those who are over fed and luxurious in their mode of living, or in those whose hepatic functions are deranged from some other cause, of an abnormal state of the biliary secretion, which often acts directly as a ferment and reduces the hepatic into sugar, or fails to carry away...
Retention as usual.

This view of the matter may receive some confirmation from the fact that there are some cases of diabetes much more under our control than others. Some are wonderfully improved, may even cure. I restrict the patient to an animal diet, cutting off all those sources of the amylaceous saccharine constituent of the food, which lead to those changes in the liver, whereby, as I have endeavored to describe, a diabetic condition is produced. Thus, again, we almost totally unprofitably, in course of treatment we may adopt, running their course unchecked when dietetic or medicinal means,—there are may refer to the second variety, in which the fault lies partly in the primary, partly in the secondary. Often, however, cannot be supposed to have the same strong impression. If the primary chemist, if the liver were better understood than it is at present, it might then be shown that the disease might be aggravated by a nitrous acid diet. Thus, as has been lately proposed, some benefit might be derived from a mixture of amylaceous or saccharine diet. As connection with other diseases are
most unexpected. Thus Dr. Johnston mentions its association with hooping cough, under the name of *pectoral pleurisy* (Lancet 1838). He bases his explanation of its occurrence on the experiments of Bernard who "shows that dyspepsia can be produced at any time in the urine of any animal by slight centripetal irritation of the medulla oblongata." From this he arrives at the conclusion that it is from "the irritation of the medulla oblongata" the most regular post-mortem appearance in hooping cough (according to T. Caplow) which is the cause of the saccharine urine. But it is a most important particular in these words: the result shows that dyspepsia is not present in the first stage, but makes its appearance in the second or pharyngeal stage. This fact will serve to explain the occurrence in a different and different manner. The irritation of the medulla oblongata may cause rise to the second or pharyngeal stage through the laryngeal branches of the pneumogastric nerve, but then the same second pharyngeal stage will also, I apprehend, by its affecting the secretion of the liver, give rise to the saccharine urine.
In the severe paroxysms of hooping cough there is great disturbance of the respiration. The patient strangles for breath & "the air passes in a slow & zigzag manner towards the lungs, through the chinks of the plottis, which is spasmodically narrowed, & "during the fits the transmission of blood through the lungs is obstructed" (Walton, Pract. of Physic).

From the lungs being thus constricted & the struggle of the blood being thus obstructed in the lungs thereby promoting mechanical impaction in the lungs, we will have, in the manner Shure evidenced to explain a hemorrhagic state of the urine. Dr. Pavy proves this briefly by an experiment on a dog, which had been half-asphyxiated by muffling its nose, & as a result of this asper in was found in the circulation to a considerable extent. This explanation is rendered all the same valid from D. Johnston mentioning a little further on that he found a concurrent state of the urine in a hysterical patient, who suffered from "a severe spasmodic cough", but the important fact is added that "after any attack of this kind, the urine shows a larger quantity of sugar than when she is perfectly quiet". He can hardly suppose that
there was any "irritation if not inflammation of the 
medulla oblongata" to account for the lachrymose 
urine in this case of pure hysteria. It may even 
be suspected that Duhamel, if looked for, might not 
infrequently be found in the urine of those hyperten-
sional patients who indulge themselves in a spas-
tic or nervous burning cough.

The complications to which I have alluded tend to 
confirm the notion that there are two forms of diabetes, 
as they can be referred to the first variety, in which 
from impaction of the liver there is an escape of the 
hepatine into the blood. In these when the 
cause is removed the lachrymose state of the 
urine no longer exists. In hooping cough we don't 
expect to find hepatic in the urine when the patient 
feels well. Phthisis is another complication 
of diabetes. "It is certain that the great 
majority of diabetic patients die phthisical" 
(Bennett - Paul & Prout of Med). The occurrence 
of both in the same individual may in some 
instances be regarded as a coincidence — as when 
diabetes attacks a patient originally predisposed 
phthisical. In other cases the pulmonary complica-
tion may be a result of a diabetic attack.
Diabetes, by its transforming, storing out of the system as sugar, the fatty constituents of the food which should go to nourish and build up the economy places the patient in a position, the most favorable for the development of phthisis. "The blood contains a deficiency of nutritive materials, in tubercular affection" (Bennett, op. cit.). This deficiency of nutritive materials, I have endeavored to show, is occasions by the hepatic not being converted into fat. "Phthisis pulmonalis is a very common complication of diabetes in persons under 30, a circumstance which appears to me to explain the pathological views formerly given, as to the great importance which should be attached to discarding, or the nutritive functions, as a cause of tubercular disease" (Bennett, op. cit.). Truly may it be said of diabetes, especially when combined with phthisis, the land of life turns out for want of oil.

The relation of the nervous system to the disease is by no means the last light of a proper healthy condition of the innervation of the liver is essential to the due performance of its vital functions.
If we irritate the eighth pair of nerves at their origin in the fourth ventricle, we have, according to Remak, a saccharine state of the urine produced; but he also asserts that a like result follows on the function of the brain being destroyed by a violent blow on the head, or else after the administration of woorali poison. Moreover he found that when the respirating function is violently stimulated, sugar appears in the urine (quoté from Bennett, "Pan & Pact of Med.").

He was led to conclude from his observations on the abdomen, artificially produced by irritating the spinal nerves, & by indirectly stimulating the respiratory function, that the nervous action necessary for the secretion of sugar does not originate in the brain, but proceeds directly to the pancreas, which is a duct to the liver, & that the blood from the pancreas, via the duct, goes to the liver, & that the diaphragm is excited in consequence by the blood passing through the liver, & that sugar hence arises in the urine. (P. E. B.) He also supposes that the lungs act by reflex action on the liver, & the liver again in the nerves to produce saccharin urine. Though it would be presumption on my part to criticise the researches and opinions of such an authority,
Asollmand, still it is the home in mind that these conclusions respecting the influence of the nervous system in producing artificial diabetes were linked to a great extent on the theory that sugar was a natural normal secretion of the liver during life. Thus any stimulus, therefore, acting interests through the nervous system might be supposed to increase this function. Hence the sugar in the urine.

I must therefore excuse him from him as to his conclusions regarding the production of artificial diabetes, as I knowly believe that the pathological condition observed will amount to a different interpretation in accordance with the owner forming poison, violent blows in the head, whereby the central functions are destroyed, tends to chill. By coma, so does the brain. In a state of coma, there is slow electricus breathing, the blood tends to stagnate in the capillaries of the lungs from deficient respiration, and as a consequence of this obstruction, the right side of the heart is filled with blood, and nervous congestion is placed by this retardation in the flow of the blood in the liver. The congestion between its vessels are submitted, an escape of the hepatic into the circulation.
will be occasioned, & hence the presence of sugar in the blood. Violent disturbance of the respiratory & intestinal, with the proper accretion of the blood in the lungs will also give rise to the same condition.

If it be true that irritation applied to the trunk or origin of a large nerve is felt at its extremities, & that irritation of the roots of the mesencephalic on the floor of the fourth ventricle will give rise to violent respiratory alterations, at least through its large ventral branches, & also to violent struggling on the part of the subject operated on, then the diabetic condition as produced will almost of the same character as pain alone, without ascribing it to an indirect reflex influence.

The exhibition of Chloroform or Ether may give rise to a narcotic state of the blood in the same manner, by disturbing the function of the brain & lungs.

Regarding the treatment of diabetes, the innocuous fulgur is not so easily carried out in practice. In those cases where we can learn that the kind of food has had anything to do with the production of the disease, great benefit is often expected from restricting the patient to an animal diet. In these recent
Cases when the patient is as yet strong and not reduced in flesh some advantage may be derived from the exhibition of codine, which, along with the shutting off of all saccharine substances or any substance capable of being converted into sugar, will tend to diminish the size of the liver and lessen the secretion of phlegm. The lean call for bread, and for amide the alkaline carbonates or the chlorate of potash may be given. And especially in those cases where we have reason to think that the disease is a result in part of a faulty state of the blood or of its product, such lameness & debility, & a diminution in the red corpuscles. A preparation of vin - tinct of ferri Perminutum, may, be found to be useful, from its being not only a tonic but also a powerful astringent, tending to check the diarrhoea. When diarrhea is the more certain, the excretion of the urine will also be hindered. The quantity of animal food allowed, should
be carefully regulated according to the digestive powers of the patient; it should contain a good proportion of fat. By diluting it with those vegetables, such as cabbage, spinach &c., which contain but little fecal-urine matter, the tendency to increase the effete matter of the blood will be avoided. Large draughts of water are unwise, & not necessary to quench the thirst, as a pure fluid, quantity, especially if taken will have the same effect.

Equal parts of milk & home water is not my an agreeable beverage; but 

satisfies the thirst better than drinking but. 

By assuring more or less of these measures we will sometimes succeed in placing the patient in a sort of neutral ground, where, if he takes proper care of himself as to regimen & avoiding every source of danger, such as cold, it is possible we may hope to attain.

In conclusion I may say this writer had to write my Essay in a very hurried manner. Had taken more time in the writing of it, perhaps possibly more brought out the views respecting the pathology of diabetes in a clearer light, but I trust that there must disagree much as to what I mean.