Thesis,

on

Diabetes Mellitus;

by

James Louttit.

Edinburgh

March 31, 1854.
Introduction.

In obedience to the Law of the University that every Gentleman presenting himself as a Candidate for the degree of M.D. should produce a Thesis upon some medical subject, in order that in some degree his professional qualifications may be tested, I humbly beg leave to produce the following.

In choosing the subject of it, diabetes, I was principally influenced by the disease having been largely commented on by the Clinical Professors, owing to the occurrence of a few cases in the Hospital this winter, and to the unfortunate fact that medical science, owing to the deficient pathological knowledge of the disease, has not yet been able to treat the malady upon an accurate and scientific basis, but it is matter of...
Introduction

of congratulation that many eminent
medical men, here and elsewhere are
investigating the subject, and that
shortly the profession will be in a
position effectually to grapple with
the ailment.

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Diabetes Mellitus.

Some of the older authors on medicine have ascribed different and varied names to this disease, thus it has been named dysstria, tabes, urinalis, hydroptic ad malum, citi emissio rerum quae libam tus, diabetes mellitus, etc.

In consequence of the excessive secretion and frequent evacuation of urine in this disease it has received the name of diabetes from diablos (a siphon or the path diabala, tranceto) and also from the urine having the odour of honey and of a sweet taste, the term "Mellitus" has been attached to specify its character.

Dr. Trout defines diabetes to be a disease in which the saccharine state of the urine is the characteristic symptom.

Dr. Copland defines it thus: Urine secreted of a sweetish taste, and violet smell, generally in large quantity, with great thirst, dryness of skin, debility, and...
Diabetes — Its history.

"and Emaciation."

We find no allusion to this disease in the writings of Hippocrates, and it was but slightly alluded to by Celsius, Galen and Aretaeus allude to it and particularly the description of it by Aretaeus is clear, and tolerably minute. He considered it a colligation of the flesh and limbs into urine. He observed that it has the usual primary course, viz. by the Kidneys and Bladder, for the patients never ceased voiding their urine, but as from the opening of the water ducts the flow seemed perpetual. Willis (translated by Latham) was the first who seemed to advance a rational and scientific theory of this disease, he was the first who pointed out the saccharine state of the urine. He states that the subjects of this affection pass more urine than the whole quantity of fluids taken into the body, besides they have a constant thirst and a slow kind of hectic fever.
Diabetes—Its history.
never always hanging about them. He has also ably investigated the principal
phenomena of the disease and endeavored
to point out its seat, but he feels ignorant
of its true nature and cause. He
has summed up a variety of remedies
adapted to its removal, but he allows
that there is difficulty in ascertaining
what are the true purposes which we
ought to watch and always keep in view
in its cure. When the diabetic tendency
commenced he found that a cure could
be effected easily, but in the advanced
stages of the disease, seldom or ever such
a satisfactory result followed, which he
attributed to the crisis of the blood being
only a little loosened and thus readily
brought back again to its former state
but when so much dissolved as to have
most of its parts separated from each
other it would seldom if ever be restored.

Snydenham, who lived contemporary with
Bills
Diabetes - Its History.

Willes, makes no mention of the sweetness of the urine in diabetes, but he has left an accurate description of its causes and indication of its cure.

Next we find notice of the disease in the writings of Cullen and Becherow and since that time many attempts have been made to discover its nature and establish a scientific and successful method of cure. It was after the lapse of a century from the time of Willis that any further advancement was made in the Pathology and treatment of the disease; eventually Dobson and Home made some investigation as to its Pathology about the last quarter of the last century. After the observations of Rollo which roused the profession to attend to the subject by the publication of Capt. Meredith's case, in which he proposed a new and important plan of treatment, and the chemical researches of Cruickshank into...
Diabetes—Its history.

into the nature of the urine, made the way clear for a number of other modern and valuable contributors to the fund of information which we now possess. Among whom are the names of Bostock, Dobson, Fothergill, Girdlestone, Latham, Lubbock, Henry, Fort, Nicolas, Baillie, Grendville, Wollaston, Warren, Badeley, Watt, Satterley, Marsh, and Christieon.

It was supposed that diabetes is a disease of more frequent occurrence at the present time than formerly, because we see so few instances of the malady in the writings of authors from Willis to Rollo, compared with the number of cases that occurred since the publication of the latter physician: but this arises in consequence of the vague idea which were held in regard to the phenomena required to constitute the disease, and as to its varied morbid relations. Diabetes has generally been considered...
Diabetes — its history considered with reference to the quantity of the fluid secreted without any regard to the circumstance alluded to by Dr. Parr, and insisted on by Dr. Pont, that the disease may exist a long time with a saccharine state of the urine, without much of an increase of its quantity, and when it has exceeded the usual quantity, that it is much easier to restore it to its natural quantity than to restore it altogether to its natural quality — but happily the disease is now better understood and its symptoms more correctly known; and a more rational treatment adopted by which we mitigate in every great degree its symptoms and severity if not altogether bring about a satisfactory recovery. Diabetes occurs nearly as well as in advanced life. We have instances of it in children under six years of age. Morton relates a case connected with the process of dentition and in which
Diabetes — Its history
the urine was sweet. In O'Reilly's practice more than half the cases occurred between the ages of thirty and forty-five, but Heberden supposed that it exclusively attached the aged and infirm, which undoubtedly is erroneous. Reference is made to a paper by Mr. D'Estambe, who concluded from observations made on the urine of old people at the Salpêtrière that sugar was habitually present in the urine of old people. There is properly no period of life completely secure from the disease though few instances have been recorded under the age of puberty.

Symptoms.
The symptoms of diabetes are obscure. Generally the disease is pretty far advanced before the patient applies for relief, or the urine found of a sweetish taste. The urine of a diabetic patient has a strong peculiar odour, resembling that of new hay.
Diabetes: Its Symptoms.

Hay, honey, whey or milk, its taste is saccharine and its specific gravity varies from 1.025 to 1.052. Dr. Grout has seen the specific gravity as low as 1.015, and in one instance as low as 1.010. This wine, he says, distinctly and rapidly underwent the venous fermentation. The relative quantity of urea is not altogether absent in diabetic urine. Dr. Grout and Henry have never observed it altogether absent. It may be here remarked that in the chemical experiments nitric acid was used as the test. Dr. Henry has proved by a series of experiments that the action of nitric acid on the urea may be prevented by its agency on the greater proportional mass of sugar. He states that urea cannot be determined by nitric acid from any mixture of diabetic and natural wine, when the former exceeds the latter, in a greater proportion than that of sixty to one, or when the solid urea is less than one-twentieth.
Diabetes—Its Symptoms.

of the weight of the mixed extract. It is

on the ammonia which comes over early

in the distillation of diabetic urine that

Dr. Henry chiefly insists as establishing the

presence of urea. Dr. Henry observes, "another

proof of the existence of some urea in diabetic

urine" is, by observing the phenomena attend-

ing its spontaneous decomposition, at a temper-

ature exceeding 60° Fahrenheit. Diabetic urine

passes into the acetous state, but if un-

perpetually watched it can be observed

that before it becomes acid there is a

point that it can be observed that alka-

line properties exhibit themselves to

sufficiently delicate tests—also he adds

that the deficiency of urea may be very

considerable. Dr. Trout also considers

the absence of urea as by no means

characteristic of diabetes. He allows that

in this and some other affections of the

urine very little urea is sometimes present,

but the same he shows to hold good.
Diabetes—Symptoms.

With respect to other principles, many of which are deficient in such urine as well as urea, he never met with a specimen in which it was entirely absent. Messrs. Kane and MacGregor have found it in great relative proportion than in healthy urine, but rendered obscure by the sugar and other matters held in solution. Cruickshank, Dalton, Nicolas (Sned), Grendeville, Fourcroy, Renard, and Bostock contend for the nonexistence of urea in the urine of patients labouring under diabetes.

In the 6th vol. of the Memoirs of the Medical Society of London, Dr. Bostock published a paper in which he stated that he had procured nitrate of urea in abundance along with oxalic acid from the extract of diabetic urine; but afterwards Dr. Bradsky sending him several specimens of saccharine extract for examination Dr. Bostock failed in detecting the nitrate of urea
Diabetes - Symptoms

area, so that he acknowledged that we have no evidence of the existence of urea in diabetic extract. Dr. Watt says that he found a little blood in diabetic urine, but this is rare occurrence. Dr. Front has seen it contain a white milky-like fluid, precisely similar to chyle, which slowly subsided to the bottom of the vessel. In this case the viscous fermentation process was induced very rapidly in the urine, the chylous matter apparently acting like yeast. The following Table constructed by Dr. Cary and partly interpolated by Dr. Front shows the quantity of solid extract in 16 oz. of urine of different specific gravity from 1.020 - 1.050. In the experiment while furnished the date of this table the urine was evaporated by means heat till it ceased to lose weight and till it left an extract which became solid on cooling, which phenomena is often exhibited by chylous urine.

Achieve in which the decomposing
Diabetes. - Symptoms. The functions of the kidneys are either destroyed or suspended. By the following table we have a connection between the quantity of extractive matter and the more certain character of the specific gravity.

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Diabetes. Symptoms.

The Table enables us to ascertain the quantity of solid matter voided by the patient in a given time. This suppose 10 pints passed in the 24 hours of the average specific gravity 1.020, it is evident that this will contain $10 + 1.14 = 2.6 = 15.7.22$ 25 pounds of a pound of 24 quart of solid extract. The quantity extractive matter obtained from diabetic urine varies considerably according to the severity of the disease. In some instances it has amounted to 2 oz in one pint of urine, but the median quantity is estimated at Wuns, of solid extract, sometimes the specific gravity undergoes great change. Dr. Trout mentions an instance in which the specific gravity was reduced from 1.038 to 1.074 in sixty hours, after the use of opium.

Diabetic urine in a moderate temperature becomes tour, sometimes ferments. When yeast is added, it undergoes the vinous fermentation, yielding alcohol by distillation.
Diabetes—Symptoms.

The quantity of which indicates the amount of the saccharine matter present. Dr. Gurnt also says that an excess of urea often precedes the appearance of saccharine matter in the urine; and, he adds, that it is a remarkable fact that in proportion as the saccharine matter diminishes under the above plan, that of urea generally increases. Sometimes sugar is altogether absent in diabetic urine, even when the urea has wholly disappeared.

A characteristic symptom of diabetes as has been before observed is the saccharine state of the urine, but besides this we have another most striking and almost constant symptom, diuresis, or an increased flow of urine, which sometimes amounts to an almost incredible degree. There is also a paleness of the secretion, with diminution of its proportion, with sometimes irascible, appetite excessive thirst, and frequently attended with
Diabetes Symptoms

with dyspeptic symptoms, dryness and harshness of the skin. The almost constant desire to make water is a most distressing symptom. The amount of secretion passed in 24 hours is very considerable — it has exceeded in more than one instance 70 pounds. There are numerous instances in which from 25 to 35 pints in 24 hours have been discharged for weeks or months together, and it has been observed that the liquid excreta have nearly doubled the whole in excreta. But the whole discharge is generally found to be less than the liquid in excreta. — The circumstance of the excreta proving greasy, more the in excreta has as yet been undetermined by physiological research, it has induced some authors to believe that it is derived from the cuticula and pulmonary absorption and also from a colliquation of the solids of the body, but so great a difference...
Diabetes: Symptoms.

between the quantity of the ingesta and urine as is here stated must be of no very frequent occurrence. A considerable excess has been proved by Dr. Bradley & he says that this excess cannot be accounted for solely on the supposition of its being derived from a general wasting & diminution of the solid & fluid parts of the system, for in cases in which his register pointed out almost a daily excess in the quantity of urine compared with that of the solids & liquids taken the patients had gained an accession to their weight of many pounds. But the experiments of modern physiologists as Klapp & Blangerfield have shown that the lungs may absorb moisture from the atmosphere also the skin may be incapable of doing so. It is admitted by almost all, that 9/10ths of the copious exhalation of the pulmonary surfaces which according
Diabetes — Symptoms.

The proportion of measurement of the infinite number of air cells wherein the aggregate must be ten times as great as that of the skin; a large quantity of moisture being constantly reabsorbed by the pulmonary surface.

Constitutional Symptoms.

The constitutional symptoms of diabetes are weariness and aversion to any exertion, a dry and disagreeable taste in the mouth, with a frothy state of the saliva, a viscid phlegm blocking up the faucets, tongue of a brownish color with florid edges, the thirst increases, and the appetite continues unimpaired, and what is most astonishing, the patient daily losing strength and flesh. The gums are soft, spongy, I bleed on the slightest touch, being ulcerated around the roots of the teeth; the sense of weakness about the stomach, and
Diabetes. Constitutional symptoms and tenes is experienced particularly after taking food, accompanied with a sense of weight, heat, pain in the epigastric, with alternate chill, and flushing and burning of the palms of the hands and soles of the feet. The sense of heat in the stomach frequently extends to the urinary organs where it appears in the form of redness at the external orifice of the urethra. Itching and excoriations with phymosis of the prepuce occurs in males, the semen is discharged involuntarily frequently after passing water, the patient loses this sexual propensities. Dr. Copland says that it is the secretion of the prostate not the semen that is sometimes voided after the discharge of urine, headache, impaired hearing, giddiness, indistinct vision, with slight oedema, acid eruptions, flatulence, vertigo, dyspnoea, cough, constipation, weariness, etc.
Diabetes. Constitutional symptoms on the least exertion, frequent thirst and listlessness, an anxious wavering feverish mind, with great depression of spirits. When these symptoms continue for some time they are followed by great debility and emaciation referable to the excessive drainage from the system rather than to the mere saccharine condition of the urine. The loss of so much matter from the system, as Elliott remarks frequently explains the hunger, the feeling of emptiness, sinking in the stomach, the emaciation, debility, an aphrodisiac coldness of the legs and depression of spirits without attributing the disease to the stomach or bowels exclusively, the excessive secretion of fluid, or when this does not take place, the fevershiness sufficiently explains the thirst. Dryness of the skin, a hay scent occasionally is emitted from the body, as Latham remarks, a similar history from the lungs, the pulse while
Diabetes. Constitutional symptoms which is at first rather than natural becomes slow and feeble, in the last stage, it becomes quick, sharp, weak, compressible, but it varies greatly in different places at different times. By attention to the above symptoms we can readily distinguish Diabetes from every disease. But we must observe that there may be an excessive secretion of urine, and a saccharine state of it too, in other affections, but diabetes can be readily distinguished by its other peculiar features. A saccharine state of the urine exists oftener than is imagined in dyspeptic and gouty individuals, and many pass many years of their lives, with this symptom more or less constantly present, who are quite unaware of it until the quantity of urine becomes increased. It is part mentions two instances of diabetic derangement and delirium accompanied by Cataract.
Diabetes. Complications & Terminations

Diabetes is mostly complicated with disease in some important organs, very frequently with pulmonary affections. We find other organs also participate in the disease, as the affections of the liver, of the digestive mucous surfaces, the assimilative functions and exhaustion of the vital energies suffer in an infinite degree, a suspension of the progress of disease of the lung, has been noticed in pregnant females laboring under diabetes but as soon as labour ensued all the symptoms peculiar to the phthisical state returned with increased severity and rapid sinking. Diabetes often proves fatal by apoplexy. G. Groft has seen it terminate by acute gastritis, brought on by taking too much cold fluids when heated, by inflammatory fever excited by exposure to cold, rapidly assuming the typhoid character. Occasionally it is seen to terminate in incurable dropsy, and
Diabetes. Causes.

1. Predispensing Cause. Hereditary predisposition to this disease is generally allowed by different authors, Dr. Root, Morton, Rollo, and Clark, have observed it in several instances, and Dr. Christison had a case in the Edinburgh Infirmary with a woman (named Burns) had two sisters who died of the disease before.

We meet with diabetes more frequently in the male than in the female, and in persons who are rather advanced in life, it rarely occurs in infancy and old age.

Some authors affirm that it is more common in some countries than in others, as in damp and wet countries, and especially when the inhabitants live on rye or any other vegetable food, or are imperfectly nourished, than in warm and dry climates.

Dr. Christison says that every statement on this head is vague & doubtful and that the disease presents itself under the

\[\text{most}\]
Diabetes. Causes.

most varied opposite systems of diet

Exciting Causes. In consequence

of the gradual slow approach of this
disease it is difficult for the patient
to assign it to any particular cause.

The most exciting causes are stated to be

frequent exposure of the body to alternations

of heat and cold, drinking cold fluids

when the system is overheated. The subjects

of this complaint have been liable to profuse

perspiration, the sudden suppression of

which by whatever means frequently give

rise to the disease, drinking of acidulous

syrups, particularly malt beers, sleeping

out at night in a state of intoxication.

The state of the mind seems to have an

intimate connection with this affection.

In many cases mental anxiety and

distress, are assigned as the chief cause.

Dr. Port mentions rheumatism - 'gout as

one of its causes - also concussions and

injuries of the back from hard riding

falls
falls, strains, &c. Inferred from his experience it usually followed cutaneous eruptions, and was a frequent concomitant of affections of the cellular tissue.

**Proximate Causes.**—The proximate cause of diabetes still lies in great obscurity, but several authors of reputation have tried to explain it, and in consequence various opinions have been formed. Some authors, as Dupuytren and Thénaud, ascribe it to a morbid action of the kidneys. Dr. Baillie thought it probable that it was owing to a deranged action of the secretory structure of the kidneys, by which the blood there is disposed to new combinations, the effect of which was the production of a saccharine matter. Meehan supposed that it depended on a morbid state of the liver while Dobson Rome Rolle & Cullen believed that it proceeds from a defect in the assimilating organs. Crawley was of opinion that in this disease
Diabetes — Causes.

disease, the tubuli miniferi were enlarged or relaxed, by which the chyle escaped into the urine. Willis thought that it depended more on some intern stimulation of the blood than on the kidneys resulting from a morbid action of the assimilating powers. He says that the blood becomes melted down, and hence it arises from a solution and waste of the blood. Home says that this disease arises from a defect of the animal assimilatory process, by which the aliment is converted into the nature of our body. Dr. Good conceived that a morbid highly irritable state of the kidneys was sufficient to account for every other derangement that marks the progress of the disease. He thought it unnecessary to suppose an idiopathic affection of any other part whether of the stomach or nerves the digestive or assimilatory processes, but comes to the conclusion that
Diabetes, Its Causes. That the whole of the phenomena may be traced to renal mischief. It is said that the kidneys are frequently in a state of irritation as manifest from the pain, heat, and weakness experienced in these organs, and the augmented urinary secretion. Dr. Lubbock noticed the coincidence of the parched and dry skin with the saccharine state of the urine, from which he was made to believe that there is a connection between the sweetness of the urinary secretion and the want of perspiration and excretion from the surface of the body, and this view was supported by an analysis of the component parts of the saccharine matter and the examination of the perspirable fluids from which he believes and has formed a theory that sugar is composed of carbon, oxygen, and hydrogen, united in a certain ratio.
Diabetes - Cancer.

ratio and supposing that this perspicuous secretion is retained in the body, it is probable that the carbon and oxygen of the carbonic acid so retained by entering undue proportion with the hydrogen of the animal body may tend to the production of the saccharine state of the urine and as carbonic acid is the production of the vegetable world, it would follow that its retention in the animal body may produce the phenomena of the defective animalization.

Dr. Copland says that these change that have been observed in the kidneys by Dr. Goddard are not in accordance with his observations and that those who consider that there is an inflammatory change in the kidney overlook the facts that decided and unequivocal marks of inflammation of the kidney are seldom found in diabetes.
Diabetes. Cancers.

When these marks are observed in other diseases they have been uniformly accompanied by diminished or entirely suppressed, instead of a more profound secretion of urine. Cullen believed that diabetes arose from spasm of the substance of the kidney but without stating in what tissue or vessels the spasm existed, but he afterwards abandoned this opinion, and described it as some fault of the assimilatory powers, but amongst the various supporters of the doctrine that the kidneys are the seat of the disorder none has attempted to name the specific affection or state of those organs which constitute the disease. Dr. Copland and others also remark that other organs and parts manifest disease very early in diabetes, and that the assimilating vessels and circulating fluids are very early affected.
Diabetes. Causes.

Expected, the kidneys being strictly eliminating organs, or excretories removing matters that are hurtful to the system from the blood. How can we conceive that excitement of these organs, the proximate cause of diabetes according to Dr. Good and others, can occasion a diseased state of other organs, diminished assimilatory function and especially a morbid condition of the blood itself, the morbidity of which it is the chief office of these organs to prevent or to remove if in any way produced. Dr. C. Darwin proposed supposed that a saccharine and imperfectly elaborated chyle instead of being converted into blood is carried to the kidneys and urinary bladder by a retrograde action of the action of the absorbents, but numerous objections have been offered to this hypothesis. It proceeds on the supposition that the chyle
Diabetes - Causes.

Chyle is generally a saccharine fluid nearly if not altogether resembling the diabetic discharge, but such is not the case, for chyle contains in health but little saccharine matter. Moreover, the structure of the lymphatics and their connection with the vascular system is completely opposed to their retrograde action. Dr. Frank has improved upon this hypothesis, he concludes it to be a disease of the lymphatic system connected with excitement of the urinary organs - that it proceeds from stimulation of both of these by some virus formed within or introduced from without, and producing a reverse effect to that occasioned by the virus of the rabies canina, so that while the latter produces a dread of liquids the former excites a constant desire for them. In support of this doctrine he adds the
Diabetes Causes.

The opinion of the ancients that diabetes is occasionally by the virus of a serpent called "dipsas" and hence the common name "Dysactis" given by them to this malady. According to the experiments of W. McGregor, the healthy stomach generates saccharine matter to a limited extent and the stomach of a diabetic patient to excess. In health there is an assimilation of the saccharine matter into other substances, but in the diabetic it undergoes no such change but is carried with the chyle into the circulation and is eliminated by the kidneys. The chyle is not perfectly changed into blood owing to deficiency of the influence of the nerves distributed to the assimilating viscera and vascular system. Neither are the nutritious parts of the blood obstructed by and identified with the various structures, and in consequence of
Diabetes. Causes.

of this deviation from the healthy standard there is a deficiency of secretions and excretions except the urinary. Particularly the cutaneous, the pulmonary, the intestinal and the hepatic as both classes of functions are under the influence of the organic system of nerves. These changes account says W. McGregor for the simple excess of urine—the more watery and unassimilated parts of the blood being carried off by the kidneys instead of being secreted from the cutaneous, the pulmonary and intestinal surfaces, and the action of the kidney, being once excited in the manner now stated, becomes excessive from the superabundance of the imperfectly elaborated and stimulating matters contained in the blood. Circulating through them there can be no doubt, but the stomach and kidneys are materially disturbed and that the saccharine matter of the urine...
Diabetes - Causes.

Urine arises from the morbid action in the digestive organs forming in the first instance an excess of saccharine matter. That the formation of this matter depends chiefly upon an exhausted, in connection, probably with a perverted state of the nervous organic life may be inferred from the nature of the predisposing and exciting causes, and this state of organic nervous energy may not only give rise to an excess of this matter, but may also prevent the due assimilation of it and of the chyle with which it contains, the unassimilated matters either retaining or still further assuming the mellitic combination in the course of the circulation, and in their passage through the kidneys this saccharine matter in the blood exciting them to increased action. - J. Duncan pointed out that a morbid condition of the organic nervous
nervous influence throughout the digestive and assimilating organs and tissues under the blood exists in this disease, and by the fact that diffuse inflammation followed bleeding in two instances recorded by him.

Chemical Analysis.
It may be proper to notice the effects produced by certain reagents on diabetic urine. According to the most recent experiments: 1st. Nitrite of Fernandez added to diabetic urine received a reddish violet tinge. 2nd. Nitrate of silver causes a curdy precipitate, of which the colour at first white soon changes to violet, and the liquid becomes limpid, with a faint tinge of yellow, it is altogether innocuous. 3rd. Lime water produces a milkiness in diabetic urine, immediately rendering it turbid and giving off a slight ammoniacal odor. After some time
Diabetes—chemical analysis. Time a flocculent precipitate occurs of which a part remains on the surface of the liquid which becomes as limpid as water. This precipitate is phosphate of lime. 4. Concentrated sulphuric acid added to diabetic urine afforded a beautiful rose color, occasioning at first a slight effervescence scarcely any precipitate and the liquor insipidious. 5. Minute of barytes rendered diabetic urine somewhat turbid, and in a short time a slight precipitate took place of a white color which was sulphate of barytes. 6. Oxalic acid afforded a light rose colored flocculent precipitate of which a considerable part was held in suspension by the liquor. 7. Sulphate of mercury rendered diabetic urine turbid, and gave it the appearance of a white salt; a precipitate of a reddish tinge gradually occurred, one half of which remained suspended in the liquor, 8. pure potash. Made 18—26.
Diabetes. Chemical analysis: made it turbid and afforded a small proportion of ammonia. 9th. Murate of lead made it of a milky color, slightly tinged with red. It was a phosphate of lead, the liquor remained transparent. 10th. Nitrate of mercury precipitates it of a rose color and the liquor became as limpid as water. 11th. Caustic potash makes diabetic urine of moderate density of a cherry red color. Yeast and sulphate of copper are also used as tests. Another very delicate test (Christison) is the action of the urine of a diabetic patient on a wollen cloth steeped in a solution of per chloride of tin — If a drop of urine of a diabetic patient be dropped on the cloth a black or dark brown spot is produced when the cloth is held before a moderate fire. Dr. Christison thinks this a very good test, but not so delicate as Caustic potash. We have also a dark brown spot produced by the action
Diabetes: Chemical analysis of the urine of phthisical patient on a woollen cloth steeped in a solution of perchloride of tin.

Analysis by Evaporation:
1. Diabetic urine after exposure to the air for six weeks between the temperature of 34° and 59° Fahrenheit, within the first 6 days becomes turbid, and gradually deposits a white flocculent substance which was found to be albumen, the liquor afterwards became limpid and slightly colored.
2. Diabetic urine became acid and turned blue, vegetable tinctures red, whereas healthy urine when putrid rendered the same tinctures green.
3. The acid urine combined with carbonate of potash in solution without any marked effervescence, the liquor after being filtered and evaporated yielded acetate of potash mixed with a small quantity of phosphated potash as precipitate obtained.
Diabetes. Analysis by evaporation: obtained was scanty white in color and composed of line, and a small quantity of magnesia. 4 th. Four pounds of diabetic urine, rendered on evaporation, four and a half ounces of extract of the consistency of honey and of a brown color, whereas three ounces, six drachms, only was obtained from the same quantity of healthy urine. 5 th. Four parts of diabetic extract was mixed with four parts of muriate of lead, and one of powdered charcoal and after being dried they were distilled in a retort. Carburetted hydrogen, and a black petrid oil was given off but little or no ammonia. The residue in the retort being subjected to a great heat gave no trace of phosphorus. 6 th. Four and a half oz. of diabetic extract of the consistency of honey being dissolved in a pound of distilled water with half an ounce of yeast added to it, and exposed to a temperature of 15° Reaumur, during 24 hours...
Diabetes. Analysis by evaporation. Hours readily fermented, and gave off a considerable quantity of carbonic acid gas. After the fermentation was over the whole being submitted to distillation yielded 10 ounces of a spirituous liquid. M. Nicolay and Breuadeville, Dr. Bostock and Cruickshank have proved satisfactorily that the different salts exist in diabetic urine nearly in the same proportion to each other as in the healthy state of the fluid, but that they amount only to one third of the absolute quantity

Analysis of the Blood. Dr. Rolls states (Capt. Meredith's case) that the patient was bled and the blood was kept for several months without undergoing any putrefactive change while a portion of healthy blood taken at the same time and placed in the same room showed evident marks of putrefaction in four days and was obliged to be thrown away
Diabetes. Analysis of the Blood. Away on the seventh. The experiments of
Viciolas & Guenandville, and other eminent
Chemists show that the blood of diabetic
patients afforded not serum, a small
quantity of fibrine and was less animalized
than that of persons in health, but
that it contained no saccharine matter.
Dr. Wollaston, having satisfied himself
how the albuminous part of healthy
serum could be most completely coagulated, and by what appearances the
presence of sugar that had been added
to it would be most easily discovered,
added 1/2 a drachm of muriatic acid dilute
with one drachm 1/2 half of water to six
drachms of serum, and immersed the
phial containing them in boiling water
for four minutes. After a few hours a
drachm or more of water sucked from
the serum that had been so coagulated
a drop of this water, being evaporated
the salts which it contained were
found
Diabetes — Analysis of the Blood.

found to be crystallized. They were principally common salt. If saccharine matter were added to the serum previous to coagulation, the crystallization of the salt was impeded or altogether prevented, according to the quantity of sugar present, also as a further test of the absence of sugar D. Wollaston added a little nitric acid to the salt, that remained after crystallization of the drop, he ascertained that when the serum had been successfully coagulated without the addition of sugar the nitric acid merely converted the changed muriatic salts into nitrates, and nitrate of soda was seen to crystallize without foam or blackness, but on the addition of sugar a white foam rose around the margin of the drop and if further heat were applied it became black in proportion to the quantity of sugar present; on applying the above tests to diabetic blood serum, D. Wollaston.
Diabetes. Analysis of the Blood.
Wollaston could not detect any traces of sugar. Dr. Henry performed some experiments on diabetic blood, which confirmed the results of Dr. Wollaston’s analysis. Dr. Petit also made a comparative examination of the blood of a person labouring under diabetes with healthy blood; he states that he was induced to undertake it with the intention of determining whether the quantity of azote was the same in each.
The diabetic blood presented the usual appearance of healthy blood. The following were the results of his experiments:

Specific gravity of the serum of diabetic blood 10.29:5.
Specific gravity of the serum, voided at the same time 10.44:8.

200 grains of the diabetic serum evaporated and dried left 10 grains of solid matter, while upon analysis were found to consist of albumen 8.7
Lactates terminal matter existing in the blood .6
Salts 10.7
Which
Diabetes. Analysis of the Blood. While very nearly coincide, as Dr. Prout remarks, with the proportions ascertained by Dr. Mareet & Bergelin to exist in the horizon of healthy blood. According to Dr. Prout the relative proportions of azote present in extract of diabetic urine and healthy urines extract portions of them were burnt with the oxide of copper.

Results. Diabetic extract 100 parts 6.5 azote.
Healthy urines extract, 100 parts 35.440.

To obviate the objection that the saccharine matter of the urine might be formed from the other principles of the blood not from the serum comparative experiments were made with the Prout of healthy and diabetic blood, the results were precisely similar as to the quantity of azote in both and at the same time the quantity of azote did not differ much from that found to exist in the serum above mentioned. From these experiments of Dr. Prout it may be inferred that the azote in diabetic patients
Diabetes

Diagnosis.

Patients do not differ in quantity.

The diagnosis of diabetes is by no means difficult when we accurately ascertain the symptoms. When the urine is pale, transparent, and of a specific gravity of 1.030 or upwards, we may suspect the presence of diabetes; whereas the quantity of the secretion does not much exceed the usual standard of health. Dr. Broun says that if the properties of the urine above-mentioned be only occasional diabetes may or may not be present, and in this and other doubtful cases recourse must be had to the means pointed out for detecting the presence of the saccharine matter in the urine.

Prognosis

The prognosis of diabetes is considered unfavorable, among the favorable symptoms in this disease may be mentioned a...
Diabetes, Prognosis.

Flow of urine of a specific gravity not higher than 1.035. Lithic acid in the urine, the gradual restoration of strength and flesh, immunity from any organic disease. The unfavorable symptoms which enable us to form a specific gravity of urine and its remaining permanently excessive, when it continues pale, coloured, opalescent, and serous. When the thirst, debility, and emaciation are extreme, and so long as the quantity of true nutritive solids does not exceed seven ounces, and when organic disease is present.

But there are various opinions among authors in regard to the prognosis and mortality in diabetes. Dr. Rollo gives a case where the patient seems to have recovered. In Dr. Christie's experience the cases were unsuccessful, although some patients gained weight and the urine was reduced to two pints, natural color and odor, yet he says that he never knew
Diabetes. Prognosis.

A case of complete recovery. Dr. Madsley mentions that of 29 diabetic patients under his care no fewer than 8 recovered.

The signs which indicate the approach of death may be mentioned. The accession of pectoral diseases, and the appearance of albumen in the urine. Sometimes inflammatory diseases carry the patient off, but the worst and most marked sign of all is sudden and great prostration of strength - whenever this occurs it generally ends fatally.

Pathology.

Anatomical research and post-mortem appearances have as yet thrown but little satisfactory light on the nature and pathology of diabetes. The kidneys are more frequently found in a morbid state than any of the other abdominal viscera. The size is sometimes greatly increased, more flabby, and gorged with blood.
Diabetes. Pathology

blood and presenting enlarged vessels with enlargement of the tubuli miniferi sometimes the ureter is enlarged, generally near the bladder, and occasionally even the urethra. In a few instances instead of the kidneys being found enlarged they were contracted occasionally we find tubercle in the lungs, the liver, mesenteric glands, prostate and bladder have been seen occasionally affected. The stomach is generally found in a healthy state, sometimes it is red, or its inner lining membrane rough and thickened not infrequently it is found enlarged. Dr. Pratt remarks that the most common diseased appearances he has noticed after death in diabetic individuals have been rather of a chemico-mechanical nature than strictly organic; so often find that urine of diabetic patients be comes natural for some days before death.

Some authors assert that the whole phenomenon
Alem does not say so, but of assimilation occurred as in the first species, the new species have some degree of progression in the course of the circulation.
Diabetes. Pathology.

Phenomena can be accounted for by peculiar irritation and functional disturbance of the kidneys. Others account for it by supposing that there is some morbid condition of the blood. Others by stating that there is a suppression of the cutaneous secretion, and others as Dr. Home, Rolle, Dubon, F. M. McGregor describe it to some derangement of the functions of the stomach. Organic changes are sometimes detected in the internal structure of the kidneys. In three instances of the disease recorded by Dr. Bradley he peculiar mottled or granulated condition of these organs so well described by Dr. Wright as occurring in droopy alaffections accompanied with albuminous urine. In a case recorded by Dr. Dupuytren & Thenuard, the stomach was found very much enlarged, its vessels greatly dilated, and forming on the internal membrane of the organ a red net.
Diabetes - Pathology.

Net-work. It also contained a considerable quantity of inflammable gas and a small portion of greyish liquid in which were floating a number of small, yellowish, round fatty substances. The duodenum and upper part of the jejunum and ileum were somewhat redder thicker than natural. No appearance of diseased was discoverable many other part of the intestinal canal. The liver, spleen, pancreas were sound. Gall bladder moderately filled with healthy bile. The kidneys were at least one third larger than normal. Their structure soft and of a grey color. But in every other respect natural. The other organs connected with the urinary apparatus were free from disease. Though the bladder was very small. The abdominal lymphatic system and the thoracic duct were more than ordinarily developed. The arterial and venous systems had undergone no marked alteration. The lungs adhered to the sides of
Diabetes. Pathology.

of the chest by loose cellular tissue. In the right lung there were small nodules containing pus. In the left lung several cysts completely filled with elastic fluid were seen. The muscles were pale and flaccid but otherwise in structure quite healthy.

In the post-mortem examination of diabetic patients in the Edinburgh Infirmary lately no particular morbid appearances were discovered. In the examination of woman Burns formerly mentioned, in which death was proved to have taken place from pure diabetes, nothing was seen in the alimentary canal, except the engorgement of the muscular tissue. The heart was found of softer consistence than natural, the kidneys were increased in size, and one half more than their usual weight. The patient before admission laboured under symptoms of albumenuria. We not unfrequently meet with similar disease of structure however in diseases very
Diabetes. Pathology.
different both in their nature and symptoms
from the one under consideration; hence
it is not to be wondered that such an
infinity of hypotheses should have been
advanced to account for the phenomena
of this disease. In different instances
different organs have been affected
while in others, scarcely a trace of the
disease has been discovered in any organ.

Treatment
In regard to the treatment of diabetes
I am at a loss to point out distinctly any
practice to be followed in consequence
of the varied opinions entertained
respecting its nature. Many remedies
have been resorted to without regard
to their mode of operation or the
pathology of the disease treated; therefore
I will notice briefly the different mode
of treatment which have been recommended
and
Diabetes. Treatment.
and as physicians of the present day
are pretty well agreed as to the principle
of treatment, I will proceed to state the
mode which has seemed most success-
ful in their practice.

1st. Bloodletting. In diabetes bloodletting
was occasionally performed by Belfoe and
Rolls, and in the present day practitioners
do not object to it in the early stages
of the disease provided it be used in
moderation. Dr. Watt introduced the
practice of bloodletting in its most decided
form and gave it a prominent position
in the station of remedies for the cure
of this disease. His physician advises
full and oft repeated bloodlettings in
order to reduce the quantity and stimulating
quality of the blood and with the view
of arresting the determination to the kidneys
and by promoting this object by low
diet, local remedies and mercury he
affirms that a cure may be effected.
Diabetes. Treatment

not only in the early stage, but when the
disease has made considerable progress
and the general strength much impaired
some succeeding practitioners, as O
Satterly and others have adopted this
plan of treatment with manifest advantage
whilst others have been unable to obtain
the same results from the treatment by
venesection, and it must be accounted
for that at that time practitioners were
not aware of the exact conditions re
quired for proving a cure, and that
in all probability the urine still con
tained diabetic although much improved.

At the present time bloodletting is
considered advisable in the early stage
when the pulse is of good strength and
volume, and the patient's strength not
much exhausted, venesection in this
stage allays the excitement and
irritability of the patient with decided
improvement in the quantity and
nature
Diabetes. Treatment.

nature of the urine. Leeches have been also recommended to be applied to the epigastrium, and cupping on the hypochondriac regions.

2nd. Astringents. - Astringents have been recommended by some authors, both of the vegetable and mineral kind, either alone or combined; nitric acid has been used with benefit by Scott and Gilby; phosphoric acid, either in combination with other substances, or given alone, has been recommended by Nicolas Grenoville le and Dr. Sharkey mentions the phosphate of soda as being a good remedy, it preserves a free state of the bowels and at the same time diminishes the flow of urine, a condition very grateful to the patient.

3rd. Sulphuric acid and its salts in combination with cinchona, opium and sulphate of zinc, sulphate of Quinine. We have found to be of service by
Diabetes. Treatment.

1st. Ionie astringents have been noticed by Morton, Frank, de Dront. A has seen full doses of the carbonate of iron with Dover's powder have the best effects.

5th. Mercurial injection has been recommended by Scott Lubbock and others. Frank has prescribed it with tonics and advised it to be pushed until it produced salivation. When biliary derangement exists, this treatment will be found of signal service and also a full dose of colocynth with rhubarb, or compound extant of colocynth at bedtime and followed in the morning by a smart purgative was often found useful.

6th. Diaphoretics. Diaphoretics have been recommended by Marsh and McCormick, with the view of restoring the suppressed functions of the skin and diminishing the determination.
Diabetes Treatment

to the Kidneys the medicines used were
puvis spécacuande comp., opium with
antimonials. Camphor has also been
given with benefit.

of the Alvine evacuations. Emetics have
been used with some advantage by Watt
and Rolfe in the earliest stages of the
disease.

Purgatives have been noticed by Dr.
Marsh. They obviate constipation and
remove morbid accumulations. Saffron
combined with vegetable tonics and
opium is considered the best form
of aperient in this disease. Sulphur
has been found useful as an aperient.
The hepatically ammoniacal was particularly
noticed and insisted on by Dr. Rolfe,
with the view of furnishing to the system
along with a liberal animal diet the
elements which seemed to be wanting
to the Chyle and urinary secretion.

Blitters and external applications
have
Diabetes. Treatment have been recommended by some, topical applications of a tonic and atirnignt nature have also been directed to be kept constantly at the coins by others. There is a case mentioned in the Archives Generales de Medicine in which there was a complete case from the use of creosote and phosphate of soda.

Dietetic Treatment.

Most authors of the present day have come to the conclusion that diet ought to constitute the principal and most important part in the treatment of diabetes mellitus under which head are included both solid and liquid aliment. It has been observed by experienced physicians that the most beneficia effects have resulted by adhering to such a mode of treatment. It ought to be kept consistently in recollection, as Dr. Pont has observed, that this disease must be regarded...
Diabetes. Dietetic treatment. regarded in a two-fold light. In respect to its saccharine state independently of the increase of its quantity and here regard this state in connection with an augmented secretion, although the discharge of an increased quantity of urine in addition to its saccharine condition generally indicates either a more advanced or a more severe state of the disease. Yet we must observe that the saccharine change is the more important of the two and that it is much more easy to diminish the quantity than to improve the quality of the secretion. J. T. Home was the first who turned the attention of the profession to the advantage of an animal diet in the treatment of this malady, but the effects of the dietetic treatment were not thoroughly understood until the publication of a treatise by Dr. Rollo who pointed out the beneficial effects of animal diet. Dr. Rollo insisted
Diabetes. Dietetic treatment, insisted on a purely animal diet, and did not allow any vegetable whatsoever in the dietetic list, but it was then found exceedingly difficult to adhere to this rule seeing that patients have a great craving for vegetables after having been for a length of time deprived of them, and more especially in hospital practice where the unhappy victims see their mates around them sating their desires with a vegetable aliment the desire soon becomes strong, and tantalized by the sight it becomes overpowering. They ask for vegetable food and the request was not granted until perchance some able and loving friend comes the way and shares part of his allowance, and so by stealth the keen desire is gratified for the time, but which ultimately lands them into infinite more distress and danger than ever they were before. But it is now found unnecessary.
unnecessary to adhere strictly to this
treatment and vegetables of a certain
kind as Cabbage and Cauliflower may
be allowed with small quantities of Bread.
Dr. Christie, in addition to the Animal
diet of the Edinburgh Infirmary has
invented a particular kind of Bread (called
Guten Bread) from which all the Saccharine
matter is expelled and it renders it
perfectly safe for the patient to indulge
in without inducing a greater amount
of diuresis and Saccharine matter, but
absolutely diminishing the quantity passed.
He has also found that bran cake
(made by making into dough one pound
of the finest bran two eggs two ounces of
butter with fresh milk) acts most bene-
ficially in reducing the Quantity of Sugar
in the urine. In this cake no Sugar is
present except a small quantity of sugar
of milk so we presume that this bread
is incapable of being converted into sugar.
Among
Diabetes: Dietetic Treatment.

Among animal articles of diet, the flesh of adult animals is preferable and it ought to be cooked by broiling or roasting with little or no salt lest it excite the thirst. The meals ought to be regulated; three or four being taken in the day, the dinner meal being the largest. The last meal a few hours before bedtime, and drink ought not to be allowed until two or three hours after a meal, for under this precaution digestion is carried on more perfectly and subsequently it is found less difficult to appease the thirst.

Drink ought also to receive particular attention seeing that thirst is often a more urgent symptom than hunger, and also more difficult to control, so we ought to regulate it accordingly. We often find the density of the urine maintains a particular standard, though the quantity be materially increased, we find weak beef.
Diabetes. Dietetic treatment. Beef or mutton tea to be very grateful to the patient in abating the thirst, the Bristol hot-well and Bath waters have been long celebrated in this disease and are amongst the most quenching (thirst) drinks that can be employed, and they are less apt to increase the quantity of urine than ordinary waters. Beer and other fermented liquors are not generally allowed. Wine is allowed in small quantity; former times it was supposed that it acted as a diuretic, but now it is believed that it is not converted into sugar, but into fat, it is given to remove languor. In France it is used extensively in this disease even to the amount of two bottles per day. Lime juice is considered a good drink. Milk is also considered grateful to the patient because very little, if any, is converted into diabetic sugar; it is considered a very excellent article either taken alone or medicated with lime water, which unites with the milk and is
Diabetic: Dietetic treatment.

- The cause of thirst is accounted for in
  cases where the starch is being changed into
diabetic sugar more water is required to
effect the change than when in health.

Opium is considered to be an indispensably
adjunct to the animal diet, more specially when there is a tendency to irritability, restlessness during the
night, by the regular administration of
opium in doses of a grain twice or thrice a day
and gradually increased so as to keep up a
calmative and hypnotic action forms
part of the most successful treatment carried on at the present time, but it is
not to be considered as a specific.

Constipation must be counteracted by laxatives. Dr. Elliotson of London
proposed cresote. He states that he
cured two or three cases with it. Dr.
Christison tried it and obtained no
satisfactory result—indeed he found
that
Diabetes - Dietetic treatment, that the secretion of urine was much augmented, even to double the quantity.

Per Manganate of Potash was also tried (Manganese exists in the blood along with iron). Those who tried it found no benefit from its use. Rennet was also tried, on the theory that the disease consists of a depraved digestion, and that it would modify the fermenting process: out of the body lactic acid reformed, and the same was thought to be formed within the body. A Christian has given it and has found no good result.

Remarks.

I would not venture to call in question the degree of success which various authors state they have derived from the treatment, remedies they have employed, and it would not be doing them justice to doubt that some of these modes of cure have not occasionally been of service and
Diabetes. Remarks and as they have for the most part been conjoined with an animal diet, we have no direct evidence of any of them having a specific virtue, and we must remember that other morbid states of the urine besides that which is characterized by the presence of saccharine matter, more especially those consisting of excess of urea and albumen, in and conjoined with an augmented discharge of the urine, have been considered as constituting a variety of diabetes, viz. the diabetes insipidus and that those remedies which were stated to have cured diabetes mellitus perhaps have been unsuccessful so far as regards the less difficult and deadly forms of the disease and which merely consists of an increased quantity of the urinary secretion without any traces of the saccharine principle whatever. But we must observe that sugar is found in diabetic urine.
Diabetes

Remarks

even when a strict nitrosoform diet is rigorously adhered to.

It has been ascertained by the experiments of Bernard that the production of sugar in the liver depends on some nervous action, and that the source is to be sought for in the brain by a power unconnected with the impaired assimilation of particular articles of diet. It is generally admitted that the nervous action has some influence on the glandular secretions. Bernard has discovered that by puncturing the pneumogastric nerve at its origin sugar is found in the urinary secretion and Doctor Harley has ascertained that by introducing stimulants into the blood of the portal vein sugar can be obtained artificially from the urinary secretion. That these stimulants irritate the hepatic branches of the pneumogastric nerve while impression is transferred to the
Diabetes. Experiments on the nervous centres, which is returned to the liver, which is acted on by the minute ramifications of the hepatic branches of the pneumogastric and so produces an excessive secretion of sugar.

I have performed the experiments of Doctor Harley and found the results in every case to correspond exactly with those obtained by him.

I have experimented upon fifteen animals of different species and in those which survived the operation I found sugar in a great or lesser quantity in the urinary secretion.

1st. Operated upon a cat, dosed with the portal vein and injected 1/2 a dram of Chloroform, a dram of Sulphuric ether, and a dram of water. The animal appeared to suffer very much from the operation, but after a time remained quite passive. After the lapse of six hours I killed him and found slight traces of sugar.
Diabetes Experiments

Sugar in the urine, and also in the blood of the portal vein. I also performed the same experiment upon three rabbits, two of which died shortly after the operation, the third survived and I found sugar in its urine after the lapse of three hours.

I operated upon a small ferret bitch and injected a small quantity of liquor ammonia into the portal vein and after two hours had elapsed. I took from her a small quantity of urine by means of a small catheter, and found, in the first instance, little or no trace of sugar, by the test of caustic potash and yeast, but after allowing the animal remain in the same condition for two hours longer I again drew a quantity of urine and found considerable traces of the saccharine matter. Allowing the animal to survive for twenty hours longer I again drew some urine, and found that
Diabetes. Experiments.

that the sugar was diminished in quantity altho the animal did not pass urine but once during the whole period under operation. She died in thirty hours after operations and still there were slight traces of sugar in the urine. On examination the kidneys were slightly congested and the ureter and bladder presented a redder appearance than usual. I performed the same experiments upon two rabbits, both of which died shortly after operation. Again performed it upon other two and injected the ammonia with the water into the portal vein and by decapitating the animals three hours after operation I found sugar traceable in the urinary secretion of both.

2. I also operated upon a small cat and a hare, and injected into the portal circulation equal quantities of alcohol and water. In two hours after I shot them and found sugar in the urinary secretions.
Diabetes. Experiments.

of both. I also several times made animals inhale chloroform, and in the urinary secretion of those examined found that sugar was present in variable quantity.

From these experiments it may be adduced that diabetes can be produced artificially by introducing stimulants into the portal blood, and by the inhalation of chloroform, and that the normal secretion of sugar is augmented by these stimulants, and as we find that sugar is produced in the organism independent of amylaceous food its chief source may probably be in the fatty matter of the portal blood. In health sugar is converted into carbonic acid and water during the acts of respiration. In diabetes it is probable, that either too great a quantity is formed for the respiratory organs to consume or the power of expelling it is diminished.
Diabetes.

As a proof that diabetes depends upon some organic nervous lesion, and unconnected with the processes of digestion Dr. Christie cites two cases in his own experience. He had a patient laboring under symptoms of head affection, which was relieved by the administration of mercury, but on relief from the affection of the brain he did not recover his strength, and on examination of the urine it was found of the density of 1380, and strongly impregnated with sugar.

In tracing back the patient's history a large discharge of urine had continued for several months, and on the immediate departure of the head affection the urine continued rather more abundant than previously, so he concluded that diabetes must depend on some affection of the brain, and still it is to be regretted that we cannot discover the seat of the affection. By an examination and dissection made along the whole course
Diabetes.
of the pneumogastric nerve, in the case
of the woman Burns, who died of diabetes,
and formerly mentioned, nothing particular
was found to advance the pathology of
the disease. The right pneumogastric
nerve was partly adherent by a small
glandular tumour on its body to a
bronchial gland, but was believed to
be the source of no irritation. The other
nerve was normal, and nothing was
found in the brain or origin of the
nerves that could by any possibility ac-
count for the disease. — But it is
to be hoped that ere long by physiological
and pathological research some new
light will be thrown upon the disease
and that as well as we can now diagnose
its symptoms, we will ascertain its
seat and so direct our treatment ac-
cordingly.

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