Might have shewn more reading & care!

He only read too many books & gave nothing original

Thesis,

on

Diabetes Mellitus;

by

James Louttit.

Edinburgh
March 31. 1854.

Introduction.

In obedience to the Laws 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 swayed 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

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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Contents.

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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 Hyderus, Tabes Urinalis, Hydrops ad Matulam, Cito Emissio Rerum quae bibuntur, Diabetes Mellitus, &c.

In consequence of the excessive secretion and frequent evacuation of urine in this disease it has received the name of diabetes from Διαβητης (a Siphon or the verb Διαβαινω. transeo) 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. Prout 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

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"and Emaciation".

We find no allusion to this disease in the writings of Hippocrates, and it was but slightly alluded to by Celsus. Galen and Aretaeus allude to it and particularly the description of it by Aretaeus is clear, and tolerably minute. He considered it a colliquation of the flesh and limbs into urine. He observed that it has the usual urinary course, viz by the Kidneys and bladder, for the patients never ceased voiding their urine, but as from the Openings 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

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fever always hanging about them. He has also ably investigated the principal phenomena of the disease and endeavored to point out its seat, but he pleads 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 "crasis" 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.

Sydenham, who lived Cotemporary with

Willis

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Willis, 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 Heberden 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

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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, Dobzon, Fothergill, Girdlestone, Latham, Lubbock, Henry, Prout, Nicolas, Baillie Guendville, Wollaston, Warren, Bradsley, Watt, Satterley, Marsh, and Christison

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 ideas which were held in regard to the phenomena required to constitute the disease, and as to its varied morbid relations. Diabetes has generally been

Consid.

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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. Prout, 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 a very great degree its symptoms and severity if not altogether bring about a satisfactory recovery. Diabetes occurs in early 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

the

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the urine was sweet – In Dr Watt's practice more than half the cases occurred between the ages of thirty and forty five, but Heberden supposed that it exclusively attacked the aged and infirm, which undoubtedly is erroneous. "Reference is made to a paper by M. Dechambre, who concluded from observations made on the urine of old people ~~that~~ 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, resembly that of new hay

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hay, honey, whey or milk — Its taste is sac
charine and its specific gravity varies
from 1.025 to 1.052. Dr Prout has seen the
specific gravity as low as 1.015. and
in one instance as low as 1.010. This
urine, he says, distinctly and rapidly
underwent the vinous fermentation. The
relative quantity of urea is not altogether
absent in diabetic urine. Drs Prout and
Henry, have never observed it altogether ab-
sent. 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
urine, when the former exceeds the latter in a
greater proportion than that of six 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 attending its spontaneous decomposition, at a temperature exceeding 60° Fahrenheit diabetic urine passes into the acetous state, but if unremittingly watched it can be observed that before it becomes acid there is a point that it can be observed that alkaline properties exhibit themselves to sufficiently delicate tests — also he adds that the deficiency of urea may be very considerable — Dr Prout 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,

with

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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 greater relative proportion than in healthy urine but rendered obscure by the sugar and other matters held in solution. Cruickshank, Dalton, Nicolas. (Jones) Gueudeville, Fourcroy, Thenard, 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 on Dr Bradley sending him several specimens of saccharine extract for Examination Dr Bostock failed in detecting the nitrate of

urea

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urea, 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 of rare occurrence. Dr Prout 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 vinous fermentative process was induced very rapidly in the urine – the chylous matter apparently acting like yeast. The following Table constructed by Dr Peary and partly interpolated by Dr Prout shews the quantity of solid extract in 16 oz. of urine of different specific gravities, from 1.020 – to 1.050. In the experiment which furnished the data of this table the urine was evaporated by steam 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.

A disease in which the disorganizing

function

Diabetes. — Symptoms.

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

Specific gravity compared with 1000 parts of water at 60°.	Quantity of solid Ext. in a wine pint	Quantity of solid Ext. in a wine pint		
	grains	Oz.	Dr.	Scr.	Grains
1020	382.4	0	6	1	2
1021	401.6	0	6	2	10
1022	420.8	0	7	0	10
1023	440.0	0	7	1	0
1024	459.2	0	7	1	19
1025	478.4	0	7	2	18
1026	497.6	1	0	0	17
1027	516.8	1	0	1	16
1028	536.0	1	0	2	16
1029	555.2	1	1	0	15
1030	574.4	1	1	1	14
1031	593.6	1	1	2	13
1032	612.8	1	2	0	12
1033	632.0	1	2	1	12
1034	651.2	1	2	2	11
1035	670.4	1	3	0	10
1036	689.6	1	3	1	9
1037	708.8	1	3	2	8
1038	729.0	1	4	0	8
1039	747.2	1	4	1	7
1040	766.4	1	4	2	6
1041	785.6	1	5	0	5
1042	804.8	1	5	1	4
1043	824.0	1	5	2	3
1044	843.2	1	6	0	3
1045	862.4	1	6	1	2
1046	881.6	1	6	2	1
1047	900.8	1	7	0	0
1048	920.0	1	7	1	0
1049	939.2	1	7	1	19
1050	958.4	1	7	2	18

Diabetes. Symptoms.

This Table enables us to ascertain the quantity of solid matter voided by the patient in a given time. Thus suppose 10 pints are passed in the 24 hours of the average specific gravity 1'020, it is evident that this will contain 10+1..4..2..6 = 15..7..2 or upwards of a pound & a quarter of solid extract. The quantity of extractive matter obtained from diabetic urine varies considerably according to the severity of the disease. In some instances it has amounted to two oz in one pint of urine, but the medium quantity is estimated at 10 ounces of solid extract, sometimes the specific gravity undergoes great change. Dr Prout mentions an instance in which the specific gravity was reduced from 1038 to 1.074 in sixty hours, after the use of opium. Diabetic urine in a moderate temperature becomes sour & sometimes ferments — when yeast is added, it undergoes the vinous fermentation, yielding alcohole by distillation,

the

Diabetes - Symptoms.

the quantity of which indicates the amount of the saccharine matter present. Dr Front 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 proper odour, with sometimes a voracious 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 & months together, and it has been observed that the liquid egesta have nearly doubled the whole ingesta — but the ~~(illegible)~~ discharge is generally found to be less than the liquid ingesta. — The circumstance of the egesta proving greater than the ingesta has as yet been undetermined by physiological research, & has induced some authors to believe that it is derived from the cuticular and pulmonary absorption and also from a colliquation of the solids of the body, but so great a difference between

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. Bradsley & 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 & Langerfield have shown that the lungs may absorb moisture from the atmosphere altho. 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

to

Diabetes — Symptoms.

to the proportion of measurement of the infinite number of air cells taken in 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 & disagreeable taste in the mouth, with a frothy state of the saliva, a viscid phlegm blocks up the fauces, tongue of a brownish color with floid edges, the thirst encreases, and the appetite continues unimpaired, & what is most astonishing the patient daily losing strength and flesh. The gums are soft, spongy, & bleed on the slightest touch, being ulcerated around the roots of the teeth, the sense of uneasiness about the stomach and

Diabetes. Constitutional Symptoms and bowels is experienced particularly after taking food, accompanied with a sense of weight heat & pain in the epi. gastrium, with alternate chills & flushings and burning of the palms of the hands & soles of the feet. The sense of heat (or), 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 & excoriation with phymosis of the prepuse occurs in Males, the semen is discharged involuntarily, frequently after passing water, & the patient loses his 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 eructations, flatulence, vertigo, dyspepsia, Cough, Constipation, Weariness,

on

Diabetes. Constitutional Symptoms on the least exertion, frequent sighing & listlessness, an anxious wavering peevish 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 Dr Elliotson remarks frequently explains the hunger, the feeling of emptiness, & sinking in the stomach, the emaciation, debility, anaphrodisia, coldness of the legs & 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 feverishness sufficiently explains the thirst & dryness of the skin. A hay scent occasionally is emitted from the body, as Dr Latham remarks, & a similar fetor from the lungs, the pulse

which

Diabetes. Constitutional Symptoms
which is at first Quicker than natural
becomes slow & feeble, in the last stage
it becomes quick, sharp, weak, & compress
ible, but it varies greatly in different cases
& at different times. By attention to
the above symptoms we can readily
distinguish Diabetes from every other 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 fea
tures. A saccharine state of the urine
exists oftener than is imagined in dys-
peptic and Gouty individuals, and numbers
pass many years of their lives, with
this symptom more & less constantly
present, who are quite unaware of it
until the quantity of urine becomes
increased. Dr Prout mentions two
instances of diabetic derangement and
debility 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, & 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 lungs 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 encreased severity and rapid sinking. Diabetes often proves fatal by apoplexy. Dr. Prout 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.

and various other affections

1. Predisposing Cause. Hereditary predisposition to this disease is generally allowed by different authors, Dr. Front, Morton, Rollo, and Clark, have observed it in several instances, and Dr Christison had a case in the Edinburgh Infirmary in which 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 & wet countries, and especially when the inhabitants live on rye or any other vegetable food, or are imperfectly nourished, than in warm & dry climates. Dr. Christison says that every statement on this head is vague & doubtful and that the disease presents itself under the

most

Diabetes. Causes.

most varied & opposite systems of diet

2nd 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 gives rise to the disease, drinking of acidulous liquors, particularly malt & cider, 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 Prout mentions rheumatism & gout as one of its causes also concussions and injuries of the back from hard riding falls

falls, strains, &c. Inferring from his experience it usually followed cutaneous Eruptions, and was a frequent Concomitant of affections of the Cellular tissue.

3rd. 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 Menard ascribe it to a morbid action of the kidneys, D. 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. Mead supposed that it depended on a morbid state of the liver & bile. Dobson Home Rollo & Cullen believed that it proceeds from a defect in the assimilatory organs. Crawley was of opinion that in this

disease

Diabetes — Causes.

disease, the tubuli uriniferi were enlarged or relaxed, by which the chyle escaped into the urine. Willis thought that it depended more on some intemperiment 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. Dr Home says that this disease arises from a defect of the animal or 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. He says, that the kidneys are frequently in a state of irritation is manifest from the pain heat and weakness experienced in those 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) an 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

ration and supposing that this perspirable excretion is retained in the body it is probable that the carbon and oxygen of the carbonic acid so retained by entering in due 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 changes that have been observed in the kidneys by Dr. Good 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 kidneys are seldom found in Diabetes, and

when

Diabetes. Causes.

when these marks are observed in other diseases they have been uniformly accompanied by diminished or an 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 excited, 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 viscera and circulating fluids are very early affected

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affected, the kidneys being strictly
Eliminating organs or Emunctories
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 conceives 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 addduces the

No. Anti Bernard's view.

Diabetes Causes.

the opinion of the ancients that diabetes is occasioned by the virus of a serpent called "dipsas" and hence the common name "Dipsacus" 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 a 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

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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 Dr. 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 actions of the kidneys being once excited in the manner now stated, becomes excessive from the super abundance of the unperfectly 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 or 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 ~~not~~ 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 the saccharine matter in the blood exciting them to increased action. — Dr 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 diffusive 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 Tincture of Turnsol 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 liquor becomes limpid, with a faint tinge of yellow, it is altogether inodorous. 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. 4th. Concentrated sulphuric acid added to diabetic urine afforded a beautiful rose color, occasioning at first a slight effervescence scarcely any precipitate and the liquor inodorous. 5th. Muriate 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 6th. Oxalic acid affords a light rose colored flocculent precipitate of which a considerable part was held in suspension by the liquor. 7th. 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. 8th. Pure potass. made Effs.

Diabetes. Chemical analysis. made it turbid and afforded a small proportion of ammonia. 9th. Muriate 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 (Christisons) is the action of the urine of a diabetic patient on a woollen 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 potass. We have also a dark brown spot produced by the

action

Diabetes – Chemical analysis
action of the urine of phthisical patients
on a woollen cloth steeped in a ~~woollen~~ solution
~~cloth~~ of per chloride of tin

Analysis by Evaporation
1st. Diabetic urine after exposure to the
air for six weeks between the temperature
of 54° and 59° Fahrenheit, within the first
six days becomes turbid, and gradually
deposits a white flocculent substance
which was found to be albumen, the
liquor afterwards became limpid and
slightly colored. 2d. Diabetic urine became
acid and turned blue vegetable tinctures
red, whereas healthy urine when putrid
rendered the same tinctures green.
3rd. The acid urine combined with carbon
.ate of potass in solution without any
marked effervescence, the liquor after
being filtered and evaporated yielded
acetate of potash mixed with a small
quantity of phosphate of potash the precipitate
obtained

Diabetes. analysis by evaporation.
obtained was a canty white in color and
composed of lime, and a small quantity
of magnesia. 4th. Four pounds of diabetic
urine rendered on evaporation four and
a half ounces of extract of the consistence
of honey and of a brown color, whereas
three ounces, six drachms, only was
obtained from the same quantity of healthy
urine. 5th. Ten parts of diabetic extract
was mixed with four parts of muriate
of lead, and one of powdered charcoal
and after being dryed they were distilled
in a retort. Carburetted hydrogen, and
a black fetid oil was given off but little
or no ammonia. The residue in the retort
being subjected to a great heat gave
no traces of phosphorus. 6th four & a half
oz. of diabetic Extract of the consistence
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.M. Nicolas and Guendeville, Drs 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 Rollo states (Capt Meredith's case) that the patient was bled and the blood was kept for several months without undergoing any putrifactive change while a portion of healthy blood taken at the same time and placed in the same room showed Evident marks of putrifaction in four days and was obliged to be thrown away

Diabetes. Analysis of the Blood.
away on the seventh. The Experiments of
Nicolas & Grenderille, and other eminent
Chemists shew that the blood of diabetic
patients afforded some serum, a small
quantity of fibrine and was less animal
ized, 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 co=
agulated, and by what appearances the
presence of sugar that had been added
to it would be most easily discovered,
added ½ a drachm of muriatic acid diluted
with one drachm & a 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 exuded 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 chrystallized. They were
principally common salt. If saccha-
rine matter were added to the serum
previous to coagulation, the chrystallization
of the salt was impeded or altogether pre-
vented, according to the quantity of sugar
present, also as a further test of the absence
of sugar Dr. Wollaston added a little nitric
acid to the salts that remained after
chrystallization 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 chrystallize
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 be-
came black in proportion to the quantity
of sugar present; on applying the above
tests to diabetic blood & serum, Dr
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 Prout also made a compar
ative 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 follow
ing were the results of his experiments
Specific gravity of the serum of diabetic blood
1029·5. Specific gravity of the same person, voided
at the same time 1024·8. — 100 grains of
the diabetic serum evaporated and
dryed, left 10 grains of solid matters, which
upon analysis were found to consist of

albumen	8·7
Lactates & animal matters existing in the Blood	·6
Salts	·7
	10.

which

Diabetes. Analysis of the Blood.

which very nearly coincide, as Dr Prout remarks, with the proportions ascertained by Dr Marcet & Berzelius to exist in the serum of healthy blood. According to Dr Prout the relative proportions of azote present in extract of diabetic urine and healthy urinous extract portions of them were burnt with the oxide of copper.

Results. Diabetic extract 100 parts 6·5 azote

Healthy urinous Extract, 100 parts 35. to 40.–

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 Cruor 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 does 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 even altho' the quantity of the secretion does not much exceed the usual standard of health. Dr Prout 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 flow

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 in immunity from any organic disease. The unfavorable symptoms which Enable us to form a prognosis are a high 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. D. Rollo gives a case where the patient seems to have recovered. In Dr. Christison'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

a

Diabetes, Prognosis.

a case of complete recovery. D. Bradley 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 most and most marked sign of all is sudden & 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 uriniferi 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 unfrequently it is found enlarged. Dr Prout 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 we often find that urine of diabetic patients becomes natural for some days before death.

Some authors assert that the whole

Phenom

Dobson does not say so, - but if assimilation is carried on in the blood specially, - & he even suspected some new source of sugar 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 Drs Bone, Rollo. Dobson, & Mr. McGregor ascribe 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 Bradsley he detected the peculiar mottled or granulated condition of these organs so well described by Dr. Bright as occurring in dropsical affections accompanied with albuminous urine. In a case recorded by Mess Dupuytren & Thenard, the stomach was found very much Enlarged, its vessels greatly dilated, and forming on the internal membrane of the organ a red net-

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 disease was discoverable in any other part of the intestinal canal, the liver spleen pancreas were sound, Gall bladder moderatly filled with healthy bile, the kidneys were at least one third larger than usual, 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 & venous systems had undergone no morbid alteration the lungs adhered to the sides

of

Diabetes. Pathology.

of the chest by loose cellular tissue. In the right lung there were small vomicae 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 whom death was proved to have taken place from pure diabetes, nothing was seen in the alimentary canal, except the Emaciation of the muscular tissues the heart was found of softer consistence than natural, the kidneys were Encreased 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

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 modes of treatment which have been recommended and

Diabetes. Treatment.

and as physicians of the present day are pretty well agreed as to the principles of treatment, I will proceed to state the mode which has seemed most successfull in their practice. /

1st Bloodletting. In diabetes bloodletting was occasionally performed by Lefevre and Rollo, 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 to it a prominent position in the station of remedies for the cure of this disease. This 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 inflammatory determination to the kidneys and by promoting this object by low diet, local remedies and mercury. he affirms that a cure may be effected not

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 Dr 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 required for proving a cure, and that in all probability the urine still continued diabetic altho' much improved.

At the present time bloodletting is considered advisable in the early stage when the pulse is of good ~~strength &~~ 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 Gruendeville &c 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 &c have been found to be of service by some

Diabetes. Treatment.

some authors

4th. Tonic astringents have been noticed by Morton, Frank, & Dr Prout has seen full doses of the carbonate of iron with Dover's powder have the best effects.

5th Mercurial Inunction 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 calomel with rhubarb, or compound Extract 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 to of

Diabetes Treatment

to the kidneys the medicines used were pulvis epecacuanae comp., opium with antimonials. Camphor has also been given with benefit.

4th Alvine evacuations. Emetics have been used with some advantage by Watt and Rollo in the earliest stages of the disease.

Purgatives have been noticed by Dr Marsh. They obviate constipation and remove morbid accumulations. Rhubarb 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 hepatized ammonia was particularly noticed and insisted on by Dr Rollo, 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.

Blisters and external applications have

Diabetes. Treatment

have been recommended by some, topical applications of a tonic and astringent nature have also been directed to be kept constantly at the loins by others. There is a case mentioned in the Archives Generales de Medecine in which there was a complete cure from the use of creozote 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 beneficial effects have resulted by adhering to such a mode of treatment. It ought to be kept constantly in recollection, as Dr Prout has observed, that this disease must be

regarded

Diabetes. Dietetic treatment.

regarded in a two fold light. 1st As respects its saccharine state independently of the increase of its quantity and 2nd As regards this state in connection with an augmented secretion, altho 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. Dr F. Home was the first who turned the attention of the profession to the advantages of an animal diet in the treatment of this malady, but the effects of the dietetic treatment was 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 vegetable 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
satiating 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 obliging 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 in before. But it is now found
unnecessary

Diabetes. Dietetic treatment.

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 Christison in addition to the Animal diet of the Edinburgh Infirmary has invented a particular kind of bread (called Gluten bread) from which all the saccharine matter is expelled and so 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 beneficially 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 maintain a particular standard, though the quantity be materially increased, we find weak

beer

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 (thirsts) 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; in former times it was supposed that it acted as a diuretic, but now it is believed that it is not converted into grape sugar, but into fat, it is given to remove langnor. In France it is used extensively in this disease even to the amount of two bottles per day. Lime water 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 found

Diabetes. Dietetic treatment.
found to make a very agreeable drink.
The cause of thirst is accounted for
thus. When 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 im-
portant adjunct to the animal diet,
more Especially when there is a tendency
to irritability & restlessness during the
night. by the regular administration of
opium in doses of (one) 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 creosote. 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.

Permanganate 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 is formed, and the same was thought to be formed within the body. Dr Christison 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 those 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 diabites insipidus and that those remedies which were stated to have cured diabetes mellitus perhaps have been successful 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 whatsoever. But we must observe that sugar is found in diabetic urine

even

Diabetes Remarks

even when a strict nitrogenous 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 its source is to be sought for in the urine by a power unconnected with the impaired assimilation of particulars 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 Docteur 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

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 Docteur 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 greate or lesser quantity in the urinary secretion.

1st. Operated upon a cat, disclosed the portal vein and injected ½ a drachm of Chloroform, a drachm of Sulphuric ether, and a drachm 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

2nd I operated upon a small Terrier bitch and injected a small quantity of liquor ammonia with 3 8s of H2O 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 & 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 water 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 ureters 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.

3rd. 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

of

of both. I also several times made animals inhale Chloroform, and in the urinary secretion of those I examined I 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 those 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.

As

Diabetes.

As a proof that diabetes depends upon some organic nervous lesion, and unconnected with the processes of digestion Dr. Christison 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 patients 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 whol course

of

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 account 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 accordingly

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