Diabetes Mellitus:—
Some points in its Pathology.

R. G. Thomson
Haworth. Saks
If an apology were necessary for selecting a great subject both as mine for treatment, the writer might give as her only one, the fact that during the past three years, she has met with quite a number of cases in her medical work, cases varying from the simple tendency of pyorrhea, to the great and grave cases of Diabetes Mellitus. Then one considers the great amount of research that has been devoted to the solution of this great problem, it is little that can be expected from the humble medical student. What will be attempted here will be merely to give impressions conveyed to the writer by one book or others, coupled with those which inevitably occur on being a treating house.

It would be difficult to give a disease on which there is so much varied opinion and although the symptoms have been known and described for thousand years ago, it would seem that we are just as far off as ever in coming to a clear understanding as to its cause.

Practically, the first great light that was shed on the subject was the work of Claude Bernard. His researches with little doubt, were the means of clearing the way for the solution of the problem. To the student who has had instruction in form the Physiologic theory, it does seem likely when he hears this denied, but despite the fact
that for 50 years this theory has been the basis for the
work of Physiologists. Still there are others who hold that
it is false doctrine. As that and may, the Phlogiston
Theory has a great deal to lay for itself. In view of the
diseases now under consideration, this subject is a most
important one. We must have some stable ground of
the accept Phip's theory in to how carbon-dioxide are dis-
posed of in the economy, we drift into difficulties quite
by far than that Which are encountered by accepting
Bernard's. Amongst those who believe in the Phlogistic
Theory, there is varied opinion as to how the bricks in
the chain is better in Diabetes, but Perry tells the
whole chain aside a forms one for himself. He holds that
the Researches Which culminated in the Phlogistic Theory
were conducted with incorrect observations. There can
be no doubt that Bernard had not the facilities for
careful observation that present day observers have, but
one cannot help surmising as if that high standard
of perfection his researches would have attained, had
he lived in these "times, hydrogen always.
It is the object of this paper to merely glance at some of the
Theories offered on the subject & to give an opinion on them;
also the writers on opinion on the subject strike him.
This subject would be analogous to that of a camp follower
who in 1859 in the engagement, nearVer the matter from
again.
Diabetes Mellitus is said to be a "constitutional disease characterized by persistent passage of glucose sugar in the urine." Clearly in the light of present day knowledge, this definition is not correct; even from the point of view of sugar excretion. Opinion is divided, but while most good physicians believe that in normal urine there is a trace of glucose sugar, naturally so may upholds their belief for otherwise their teaching falls to the ground.

(2) P. recently, Kellogg and Withered published the results of a long series of experiments on this subject. They conclude that none is sugar in normal urine, but if a small percentage of that given by Pasy, such cases no normal urine evermore require debakeheeds, but we must accept the fact that urine naturally contains sugar.

In the writer's opinion, Diabetes Mellitus may be said to be a disease due to faulty chemistry, whereby urine in persistent passage of glucose sugar in the urine. Which sugar is only detectable when the ordinary chemical tests are applied, or when the diet does not contain more than the normal content of sugar.

(1) What sugar is in Diabetes or ordinary urine come from the blood, from what source does the blood get its sugar? The physiological theory teaches that its comes from the liver. Dr. Pasy and all others, is obviously opposed to this view. He claims that the liver is a sugar forming organ, but believes that sugar exists in the blood in proportion...
as thin in the case as with those by Engan in the brain.
It is believed that there is no more oxygen in hepatic blood
from there in any other part of the circulation

Pumps. Here might be put briefly then;

That normally oxygen is not carried by the tissues & hence
used there, in a free state in the blood.

That the smaller molecular composition of bicarbonate makes it
impossible for such a state of things to exist, without the
oxygen being transported through the system into the veins & that in
other cases there in no such thing as impermeability of the
system.

That the absorption of carbohydrates from the intestine into
the circulation is not merely an primitive process (which all
are agreed upon).

That carbohydrates are changed in the intestine into Dextrose
& carried to the tissues in a locked-up state.

That the means for perpetuating such a condition are found
in the intestinal Stool, viz. the lymphocytes, grow & multiply
during digestion & can be used for fat, purely in cooperating
the dextrose + pepsin into their histoplasms, analogous to
Peachum's experiment in growing yeast cells in a medium
of glucose, in the & ammonium, & 2% yeast + water.

That, further, matter has a glucosetilde; formation

That the carbohydrates of the food is "acclimated" in
the intestinal Stool by the lymphocytes & is carried by

(1) Carbohydrate Metabolism (Perry)
The insensitivity in the blood to the tremor is not exhibited there
that the cell acts as a barrier which prevents free sugar
getting into the circulation.

That this takes the total of any change escaping through
in the cell, changes to others, glycosuria, and subsequently into
fat.

That in Diabetic Fasciculation there is a failure in their assimila-
tive processes, with the result that free sugar finds its
way into the circulation with attendant glycosuria.

The other points in connection with Dextrose regarding
its Pathogenesis of the disease will be mentioned later.

Dextrose Chief argument in holding that free sugar cannot exist
in the blood without a diabetic state, if reasoning, is based
on the results of a large number of experiments consisting
in the intravenous injection of sugars. Thereby he shows
that certain sugars cannot be injected without the presence being
seen in the urine. The same applies in a lesser degree
in subcutaneous injection. It is to be noted, however, that
Fort made similar investigations with subcutaneous
injections in the human subject and found that more
sugar could be used than unless the solution were very
concentrated or successive in quantity.

Assuming that it is as Dextrose says we might argue that
the injection of sugars is not analogous to intestinal ab-
orsion. The latter is not merely a process of fermentation.

(1) Williams' "Diabetic Fasciculations" page 87.
but a vital phenomenon, it is possible that, in the process of absorption, glucose may be loosely combined with another body, yet we need not necessarily assume that carbohydrate matter enters into the production of a glucose-like body with the particle.

Again, before the injection, there is the normal sugar, already in the blood, with the additional after the injection it is not surprising to find the latter heated, to some extent, at least, as a foreign substance.

Furthermore, when we consider that sugar, an even in the curve of diabetes, in an irritating substance, it is not to be wondered at that when it is in excess of the normal physiological amount in the blood, that the kidneys get rid of it accompanied with greater secretion. 4 urine to even occur in dog experiments.

Now, although not in the form of pure sugar, many believe that carbohydrate are utilized in the tissues. This is brought about by the liver, after the drink is added with the particle. The carbohydrate is the impetus into the liver, and then the liver, carry them to the blood then to the tissues, certainly present are not found in the blood, but the same cannot be said of glucose.

It is also asserted that the lymphatics do not reach the circulation through the blood vessels but through the lymphatics. The latter being the natural way of the former.

Bacterial Reptile. Page 28
It is customary to believe that chyle differs from lymph only in the amount of fat it contains. Again digestion of the intestinal duct makes no difference in the amount of these alterations. These points favour the idea that blood matter of the food passes by the blood vessels, again how could one form the hypothesis be brought about in the liver of a long starved animal by feeding it the raw meat of the Protozoa? Therefore one sugared, induced the assumption by the lactate.

We must accept it then that sugar normally passes into the general excretions by the blood vessels through the liver.

There is a difference of opinion on the subject of the glucose from the Protozoa. Sugar can be derived from Proteins. Very few have given rise to this by many ways. We know that feeding animals on meat leads to production of glycogen in the liver. It is to be noted that in advanced cases of Diabetes larger quantities of sugar may be extracted from the liver. One may be taken from the matter, either in the blood or from Proteins. If this Protozoa is broken down it forms certain of its components parts, carbohydrates in built up again in all details and in the liver cells, the building up theory seems more plausible. For these reasons, if the sugar is built up from the Proteins then the amount is the

(1) Albutt, Medicine, page 770
small & account for the large excretion in Diabetes. When
the carbohydrate food is cut off, for according to 
Sippy
the percentage is not very large. Relation gives no
chloride of carbohydrate yet fasting amine the gluten
lent to produce glycerol in the liver. Casim yields
a low percentage of cleared FF carbohydrate whilst
egg albumen gives a high percentage; yet fasting
a diabetic with pure casim tends to give an increase
in sugar excretion, whilst fasting with the egg albumen
tends to reduce it. These facts seem to contradict the
glucose side view. Von Morgen gives other interesting points
pointing in the same direction.

Coming to the liver itself, Sippy denies that the organ has
any sugar forming power. That the liver produce glycogen
he admits, but no sugar. The liver in his estimation
is merely a bip gap to prevent any thing besser must
escape being assimilated in the blood entering the
circulation. The liver cannot then change it into glycogen
or consequently into fat. If the liver is merely a bringer
at receiving argan it is rather remarkable that its function
in to albumin interface with ray in acute diseases like
Acute Yellow Atrophy & Cancer. Again there is always
sugar in the blood whatever the food or without it. One
ought to expect. From that, if the liver is just a bringer
securing organ, during starvation the sugar in the
blood would disappear during from in a constant
(3) Carbohydrate Metabolism p. 55.
lossage in the intestine. Or, again, why does cyanosis or bluish color set in after glycogen from the liver?

Other observers besides W. King thought the liver forms sugar based on examination of the blood. If it is difficult to gain authentic information by blood examination, surely definite evidence must have been produced if sugar is got in other way. Maltose to glucose lactose to glycogen if the liver resulted in the blood becoming free from sugars, then have shown most duration the lactic acid blood raises than the same effect. These results can only mean one thing.

Again, King believes, as evidence from the examination of the liver, that the production of sugar in the liver after it is excised is due to rapid change of content that "taking the condition of the moment of death there is no difference discernible between the liver & other structures," but owing to its anatomical position it contains more of glycogen a fact after death is ferment in develop which rapidly changes glycogen into sugar. He does not believe that this change in the same fact could possibly go on during life in the liver & hence his statement on main argument. If he says, we grant that the actual amount of glycogen in the liver in 30 per 1000 or concede that (according to his statement) 12 per 1000 of sugar is produced in the liver during the first 10 minutes after death.

Then in 3/4 of an hour Mrs. Whibley's data livers glycogen would be 0/5 William's cited, page 25. (2) Physiology of the Carbohydrate. Page 1000.
has left the organ a yet after no to 4 hours of fasting

When there is no way of replenishing the stores of Glucose

from ingesta we can still find Glycerin in the organ.

Such a condition would certainly mean Diabetes Mellitus.

But such an argument does not necessarily prove

that sugar is not produced by the liver during life.

The sugar production here may be due to post mortem
change, but one must conclude that when the liver is

first excised the hepatic cells are not dead or further

more an excised liver is deprived from influencer

going on in the body, that a liver in a living animal

is not. The refer to the action of the Pancreas, an organ,

in the treatment of this subject. Every does not give to

such a place as he ought perhaps: If, as in the earlier

conclusion, the action of the Pancreas is to give to the tissue

of the body generally a power to find a detritus carbonhydrate

(of the liver is certainly included in this statement) then

been without any post mortem change that is ferment pro-
duction, whenever glycerin is changed into sugar. The lack of

this power to control sugar formation might easily

account for the production of sugar rapidly, by the excised

liver, the cells being still living. After the death of the

cells ferment change will account for the further rapid

glucose production.

Again to prove his assertion he liquefied liver in Alcohol

which after drying can be kept for an indefinite period.
on adding water and applying the necessary heat, sugar can be produced. This also proves nothing in the direction under discussion. It does not form that the liver is not a sugar producing organ. This we accept. The statement that it is, and by the liver the muscles seem to be the organs which have much to do with the absorption of sugar. They contain glycogen, although glycogen is not an essential constituent. During that muscle can make long continued contraction after all its store of glycogen is used up, but we take it that in muscle chiefly the hyaluronic is utilised. The term sugar destruction used in this connection does not appear to me entirely sugar destruction might possibly be a better term for the condition seen in Diabetes where sugar is excreted unchanged. If this condition it is to be noted that observers such as Lepine believe that sugar is discharged in the blood by the action of a sugar destroying formed by not so why should muscle have the power of accumulating glycogen? It is more probable that sugar is excreted by the liver it is more used.

Perhaps the most important discovery and Sara Z Bernard in connection with the causation of Diabetes is the fact that the pancreas would seem to have on the metabolism of carbohydrates. That disease of the pancreas had a bearing on Diabetes has been known for a long time, but, 18 years ago Z Bernard showed very definite evidence by his famous experiments of destruction of the pancreas. Since then we have shown that it was not due to destruction of the Pancreatic juice.

That if 70% of the gland remains, no symptoms follow, but of this portion degenerates then symptoms set in. Again 70% in grafted into the abdominal core & again it has got vascular connection & the remainder of the gland persists, no symptoms follow. The Diabetes produced in an essential similar to that met with in the human subject to this extent by the fact that giving few Pancreas by mouth or subcutaneous injection of its extract, has no effect in abating the symptoms. Despite this fact however one is driven to the conclusion that the Pancreas exerts some influence on Carbohydrate metabolism & this is only proved by the removal of the organ.

The idea that the islands of Langerhans secret the necessary something to balance the action of the organ having to do with carbohydrate absorbed in food, not generally believed. These islands are phagen in the body. Testing of the gland it would seem these in constant change going on. According to the amount of discretion performed by the organ as during rest, it exhausts the fact that definite the chemical property necessary is not known but we take it that there is such a substance & we call it chemical. This body can be produced independent of nerve influence although we must not be forget the fact that any gland separated from the nerve supply will in time cease to function properly. Previously it has been stated that Diabetes Mellitus may be a disease due to faulty chemistry. In support of this contention it is of interest to consider recent chemical bodies called Hormones.

(1) Mearns company lectures on recent advances in the Physiology of Diabetes (Scully) p. 192

(2) E. H. Starling
In the form of life before anything takes a central nervous system is reached, chemical action has a great deal to do with the functioning of groups of cells. It has been proved that such a condition actually exists in the human body.

It was once believed that, when the acid content of the stomach passed into the duodenum causing a flow of pancreatic juice to follow them, this was due to reflex action. The brain centers being acted on, hence, however, Hertleimer showed that the same result followed when all nerve connections central and sympathetic were covered. This was supposed due to a local reflex passing from mucous membrane to the ganglion cells of the pancreas. But Hertleimer proves that the pancreas can be stimulated when a catgut tube is ligatured in two places leaving it loosely attached by its blood vessels, by simply injecting into the lumen an acid; hence no nerve influence is necessary. From this one might suppose that simple injection of acid into the blood would yield Pancreatic secretion, but this is not so. Scrapings of mucous membrane mixed with acid, gelatin or the gelatine injected into the blood stream however given an flow of pancreatic juice just as the stomach contents passing into the duodenum did. Something is produced by the action of the acid on the intestinal wall, which passes by the blood to the Pancreas causing it to flow out the secretion; evidently quite independent of nerve influence.

(2)

From the action of secretion on the liver in the liver as

(1) Stirling this page 86.
(2)
that on the Pancreas. Both organs are equally stimulated.

The flow of bile & Pancreatic juice is synchronised. From these facts, chemical action, since it simple, may have a great deal to do with the process of digestion secretion.

Now, looking at the combined action of Liver & Pancreas under the influence of the chemical stimulant, an action whereby both the absorption of fat & a quite amylolytic effect is obtained than by individual action, may it not be possible that a combined action on the two organs may be looked in another direction too in the disposal of carbohydrates, after they have been absorbed.

It has always seemed to me, that the necessary something given by the Pancreas is purely chemical in nature. If you were wanted to support them, then the fact has only to be mentioned that the abdominal grip of the Pancreas is all that is necessary to prevent the appearance of glycerine. Theoretically no matter might be fed this way. The Pancreas given off a secretion which has an influence on the liver & releases generally those by sugar in part in a rate of production that is, for being released. According to the amount of carbohydrate intake by the food, to which the power of the Pancreas be related. To do & help the blood uniform as far as sugar be concerned. If there is no Augustation going on & the tissues are using up the time of carbohydrates, then the action of the Pancreas will be lessened. Men in able the liver to deplete according to time necessarily.
The influence which controls the secretion of the Pancreas must be something in the blood, some bye-product of metabolism. It is, however, very possible that the Pancreas requires some complementary substance for the production of its internal secretion as evidenced by the fact that whilst Pancreas in the mouth in the stomach is deactivated, it has no power in controlling glycorrhoea. The abdominal graft simply attached by its blood vessels has not, therefore, been taken as an analogy to secretion.

Recently, secretion itself has been tried in the treatment of diabetes, but its action has been proved to be doubtful. The observers differ in their opinions on the matter, but whatever be the elements necessary, we must leave it here that the same element is a little one may exist itself on the liver to the pancreas to give form of diabetes. We shall mention later, having the complementary substance for the time being we will consider the Pancreas itself. Mention has already been made of the great changes which occur in the Pancreas during its active life. Here is constant change going on, it is reasonable to suppose that during its lifetime chemical changes may be in the right completely alter its secreting power. It may well be within the bounds of possibility, that, although neither the chemical substances in the milk, nor the milk itself can affect changes in the organ, diseased by the milk itself, the chemical changes which may have a great bearing on the action of the organ. What is described as functional change may be rather more or less from a chemical one.

(1) Lancet, Sept 30, 1856.
In Diabetus we find varied conditions of the Pancreas. We may have the organ apparently quite healthy or the organ absolutely changed. Again we may find a changed Pancreas with no Diabetus present. In the first case chemical change may be present preventing the organ yielding its influence. The second case is easily explained if we believe that the Pancreas changes are the primary cause of the disease. As for the third condition, if only a portion of the gland can function it glycomix may be prevented. When we consider the change that goes on in the body in Diabetus one might say that the Pancreas changes may be a cause of the disease, but in the light of the effects of removal of the Pancreas it is more than likely that the change themselves are the cause.

If we put it briefly then we may say that in the action of the Pancreas in its influence over carbohydrate metabolism we have a chemical one and independent of nerve influence as far as the direction is concerned. (It is not stated here that Diabetus is a disease independent of nerve influence.)

That the Pancreas requires some complementary body to enable it to Secrete its "internal secretion"—a hormone—

That in proportion to the output of the liver or the amount of carbohydrate to be disposed of, the secretion of the Pancreas is inhibited or obstructed so as to keep the blood uniform as in sugar. That in Diabetus diabetes, this complementary
Substance may possibly be absent, but more probably the condition arises from pathological change in the gland or from Febrile Chemistry.

That which follows is, The feeling properties of the liver are those for absorbing whereby the liver is enabled to detect danger in disease without complications to organs or the tissues e.g. Middle hearing lasting longer with caution.

But we must not lose sight of the fact that some influence is in the causation of Diabetes. As seen in the body, the change in the disease, the nervous system is no exception. It is difficult to realize what all these changes could be. The cause is more difficult.Undoubtedly, it is impossible to understand how mental emotion, shock or can be the primary cause. Examples such as these latter are not difficult to find where the symptoms are due to loss of power of feeling, shock, worry or the writer has under his care at the present time two such cases. Again, a case is recalled when the symptoms were greatly aggravated by a fall on the head. Cases are recorded where blows on the head have been attributed as the cause of the first symptoms. It need not necessarily be supposed that blows on the head can in all cases produce permanent injury to the nervous system, but still the fact remains. The typical experimental analogue of a wound injury producing 3 symptoms, is Bernard's function.

But these cases arising from the causes mentioned have nothing in keeping with this. It might be said that each
Casse was just on the borderline of a Diabetic diast.

That the cases assigned were simply the leading causes to complete the condition already threatened, or may be a feasible explanation but there may be more in it than that. In the case of a Diabetic patient, where urine was practically begun for the symptoms of excessive began excretion immediately followed on his falling on the back of her head than she was more frightened than hurt.

How in the Paralytic experiment after the glycerine, then all lost the liver as began, the glycerine ceases. Furthermore, once the liver has been got rid of by observation or by inference, no glycerine followed the function of the idea is conveyed that irritation of the intestine causes the liver to become began extensively. As in the case of mental emotion, it is difficult to attribute it all to central lesion bowels in Diabetics that mental influence must could cause symptoms similar to those seen after the experiment further.

Many brain lesions exist without Diabetes.

Pappy firmly believes in nerve influence as being a prime cause of Diabetes, emphasizing his belief quite plainly in a paper read before the Medical Congress at Boston. He attributes the condition as being due to loss of the paralysis implicating the vessels of the chyliferous tissue. Mercury the blood passing through the capillaries does not become properly the artificialized which prevents due assimilation of Carbohydrates in the intestinal villi which incur the disease in the system.
hepatic cells to change glycogen into sugar exclusively.

That hyperglycemia of the blood can produce glycosuria

hence can be its cause, but as far as this is concerned

cany thinks it is quite an extraneous organ in the matter of sugar.

But this theory will not explain the greater forms of diabetes.

He also draws attention to the highly vascular condition of the tongue,
an evidence of the diabetic state. The vessels also at the

ventral forms of the disease are seen in diabetic individuals,

and this is from its probable nervous origin

Thus is good reason for believing that the liver is not the

only organ implicated by the diabetic function. The pancreas

to be in all situations affected as well. And in diabetes, very

well from the experiments on the subject by Kaußmann

If the vessels of the liver are cut, from liver to the ventral

glue glycemia, but if pancreas is cut, the pancreas the vessels of

the pancreas are cut, the glycemia follows. Again if the vessels

of the pancreas are cut, the liver itself the pancreas.

Again, if the liver vessels are divided, removal of the pancreas

gives obstructive sugar in the blood. Showing that the pancreas

can influence the liver to control sugar formation through

the blood stream and independent of the nervous system.

Kaußmann also finds that the diabetic function has an in-

fluence on the liver generally and liver it as well.
dispersed of sugar, so in Pancreatic Diabetes, with the enter.
If the liver is injured, the pancreatic is followed by great hyper-
glycemia. This cannot be surprised at as a general effect being
the result. Where no local lesion is considered from the fact, diabet. the test shows that the

flame influence is in a greater in the production of the sugar
of not of Diabetes. At the same time it is to be noted that the

experimental lesion yields the classical symptoms of Diabetes
like those produced by removal of the Px.mctas. In certain
brain lesions we might find a condition simulating the

lesion, but in the other T. a small percentage of such
lesions may only be associated with Diabetes. A lesion
in the brain may not be accompanied with Diabetes, whilst

a fasting affection may.

of nerve lesions, both the general or experimental, produce
Diabetes, may it not be partly by their effect on the organ
having to do with sugar dispersed in the body. If one brain
affection produce Diabetes in one person, a similar affection
does not in another, demonstrated, proof positive, then it may
possibly be explained in this way. Recently the writer has
been interested in tracing the quantities of sugar and

carbohydrate for N. that some individuals can take as compared
with others. The craving for both varies. In the writer's own
cases. The craving is at the same time, the power of dispersed, are
alike on the other hand to the lesser side. Insulin quantities
are taken with no evidence of secreting, loses a vital dea


If the patient did not give his attention, he would be inclined to another direction - adaptability. But again could not ingest both quantities without evidence forth-coming in the direction of the other. The difference between a diabetic and diabetic lies in their power of absorbing or "burning" the food. The diabetic may be very near the border land of diabetes, yet in a case of central machinery causing, directly or indirectly, the diabetic state, it may mean that the power of absorbing carbohydrates in the system is 7 times over a meal when the insuliminded means insulose to integrate with the organs involved in carbohydrate metabolism - whether it be in recalling the brain or other organs in producing the function of the pancreas - that we have hypoglycemia with its attendant glycosuria. Whilst in a case with the same lesion in the nervous system, the power over carbohydrates is reduced in great degree, not with results may the brain death may suspensions before symptoms of diabetes set in, and in before the lesion of the pancreas has been completely involved and consequently before the complete absence of the internal necessity something which may be brought about by chemical changes in the cells of the organ, as for lack of mental emotion being the origin of diabetes he might reason in like manner. I have known that effect, more or less on the digestive organs in daily life. None of the digestive organs in daily life. None of the nerves in the presence of diabetes. Sensitivity may precede the eye - mental perturbations have a great effect on the initiative. But whilst we know we have one organ when their function is impaired, it is rare for us to realize we have a pancreas.
If some phases of the mind affect other digestive organs, why should they not affect this one—the pancreas. It may be possible that in a case where one pancreas is in a low anti-diabetic state, the other and mental disturbance may be the least of these. We have been told that both liver and pancreas can function independently of connection with the central nervous system, and then the liver & the liver are destroyed, while the pancreas intact, the diabetic symptoms cause glycosuria. That can only mean that the pancreas has stopped pancreatic function. May not mental emotion act similarly? If the mental condition were lasting it may be most complete functions change taking place in the organs. The conclusion that the writer forms on the matter are, that nerve influence is a factor in the production of glycosuria, but that in the causation of true Diabetes it is only in proportion to the permanence of its effect on the liver, producing a tussle or stimulating organs both can be said to be a cause of attacking & the normal functions of these organs being impaired. That the only experimental form of classical Diabetes in man when the pancreas is interfered with. That nervous action & mental phases may act by simply throwing an impaired pancreas functionally, off the balance, or by their combined action but if a functional alteration in that organ.

Now, coming to the disease as seen clinically, many cases of glycosuria are met with that could not be placed in the
Diabetic Category. They may be simple, transient form of glycosuria with sugar born in the urine occasionally or even when the general condition of the body good and not in necessary to help the serum sugar free. The main point
with regard is that the sugar in the urine may be quite normal for they are generally discovered accidentally and in quite possible that if they were allowed to go on without treatment, that the condition might pass on to true diabetes. But when we come to the true diabetes, we have quite a different set of affairs, where a normal diet constantly yields glycosuria. If one might classify diabetes in a simple fashion, one could say that there are two classes, the simple or the malignant, both being forms of the condition no doubt, but when the simple or alimentary form is present, it is completely amenable to dietary treatment; now it passes on to the malignant or an Party calls it the composite form. This classification is generally speaking,
for the first to note to be modified and come cases of the disease presents features different from those of others as for example cases with great emaciation and with certain tendency to adiposity.

Taking the definition which previously there, we say that if a person persistently passes sugar in the urine, sugar which is noticeable by applying the ordinary chemical tests, then is the natural diabetes. The diet in not above the normal in carbohydrate good, most persons in suffering from diabetes
Besides, these cases are not often symptomatic. Asthenia, thirst, weakness, anorexia are common concomitants of appetite although it is difficult in most cases to gain any information from the patient as to when the condition originated, it then happens over again, that the patient can give a fairly accurate idea as to when they first noticed the excess of want into cases, the one an old man who stated his symptoms from the time he lost a brother, the other, a young woman who drank excessively of cold water on any hot September during the excessive heat. That very night she was greatly troubled by having to get up to urinate, complete removal of the burning desire was not difficult. If she were warm and dry, she said it began at first. Now drinking cold water can produce such a change in not clear; although it is common authority it may be explained by saying that it was a case merely of natural origin looking at the chief symptoms of Diabetes, while some of them are as yet completely beyond explanation, others are fairly intelligible. If we take the excessive appetite for instance - if we consider that in Diabetes lies in a large proportion of the ingesta, remaining to waste, it is not difficult to understand why there should be a transient appetite. Although large quantities of food are taken in, satisfaction is not being given to the body generally. Hence the great craving of the Diabetic. He is in short like the dog with the stick which cannot catch or eat. But when the diet is so arranged that what is taken can be withheld, then the craving ceases.
In the simpler forms of the disease other symptoms lead to another symptom which can again be quite well explained. When began to increase diminish, at first fear. In ordinary thirst much relief may be gained by simply washing out the mouth with water. In Diabetics this has little or no good effect. Sugar in an infatuation is in evidence by condition produced in various parts of the tissues in Diabetes a little in place of Diabetes is simply due to the tissues calling for dilution of their irritant.

As to dehydration, in many cases when great thirst is a prominent symptom, it may, in a great measure, be influenced by the large amounts of water taken into the system. And, here again, the irritating action on the kidney may contribute. The output of urine varies with the amount of sugar excreted as a rule, although cases are known when the condition has passed from Diabetes Mellitus to Diabetes Insipidus. If Diabetes is due to intolerance of water, its influence results the body retains water. The kidney, then, cutting off the water, the body gains. In the latter case, water is necessary, the condition becomes self-sustaining. But in the former case, water is generally, cutting off the water, the body gains. In the latter case, water is necessary, the condition becomes self-sustaining. But in the former case, water is generally, cutting off the water, the body gains. In the latter case, water is necessary, the condition becomes self-sustaining.
fat, indeed soap bubbles and glycogen is merely an inter-
mediary stage between sugar + fat. Certain individuals
have a greater facility for the production of adipose
tissue than others. Just as the body may have a
greater relative assimilative power over 
carbohydrates than others whose indeed, large amount of 
carbohydrates
can be disposed of and may remain.

Eugan showed that in cases of Diabetes with diabetes, the
better condition may exist a long time before Diabetes, but in
this, the change may be seen in terms as the characteristic
period. The writer has seen an example of Diabetes with
diabetes in a young man of 19 years. The difference between
Diabetes with emaciation - Diabetes with diabetes, may be in
this, that in the former case, the power to assimilate
sugar for to build up fat is present, while in the latter
it would seem to indicate that the power for fat formation
so long as it was prominent, with the absence of fat formation
which effectively utilises carbohydrate, but when fat for-
mation failed to come about, the already weakened power
of carbohydrate metabolism could not interfere. If the amounts
that were previously built up into fat:

When we come to the facts of the production (or lack of
utilisation) of sugar in Diabetes Mellitus, however, the
explanation is difficult. As to the simple forms of the
Disease, the writer has expressed the opinion that Organic
change or faulty Chemistry in the Pancreas may account

(1) Wilburson, page 137
for it in some cases, whilst in other cases influence ether causing increase secretion by the liver, or causing the function of the Pancreas to be inhibited, partly by allowing excessive secretion by the liver, preventing storage of glycogen, also preventing the liver from forming the same. It is possible that temporary, transitory cases of diabetes may have their origin in these same influences, but in all probability those which are permanent. Assuming a diabetie quality is due to changes in the pancreas itself, can be very thoroughly understood. When we come to the grave forms, the disease must be considered to be present from birth. Even in the simpler forms, there is some change in the pancreas, since the organs can adapt to, and in the other forms, whatever the diet, there is still evidence of sugar in the blood, or in certain cases, more sugar in extracted meat, could be accounted for in coming by the diet. Meat in a day of meats be derived from the tissues themselves. To this, may be added the great emaciation, the more pronounced appearance of the muscles.

The question naturally arises, if the tissues cannot use sugar, why the great production of ketone? Camp explained in ingeniously, of course in keeping with his belief that meat and meat matter has a glycemic formation. He believed that sugar circulating in the tissues has a toxic effect, and in support of this instances, condition such as anaphylactic diabetis, Kennedy model of amian in diabetes; that in effect, sugar acts just as Phlebotomy and Administered drugs.

There can be no doubt as to the correctness of this contention, and evidence in forthcoming in the glycolytic degeneration of the renal epithelium described by Shelled.

(2) 

Attaining a stage when the disease assumes the major form, the cells in a stepwise breaking down process, as noted by Shelled. 

Preceding by successive steps, until CO2, Ammonia and water are produced with full disengagement of energy 

Locked up in the original molecule, it retains in a half-way stage of manner setting free principles still containing unutilised energy. Sugar is cleared up from the post-glomerular molecule & rendered useless by its being passed into the blood & urine to the needs. It has been already been noted the glomerular theory does not command full acceptance, reasons have been given why it should not, at least at present, be accepted, but P. Hamilton Man. The phenomenon seen in Shelled in diabetics seems to bear out this belief. 

Here in the attendant hypoglycaemia in main from of Diabetes. Not just of all the glycogen of the tissues is depleted 

Into the circulation where it combines with the portion of the blood which passing through the kidney from its being 

Element abridged from it by the renal cells. This in a second 

An explanation of Shelled in Diabetes as any other bent 

To help a gained from it in explaining the greater form of 

Diabetes. Take an example. The amount of sugar excreted 

Varies in Diabetes it may rise up to 12 g. in the first hour. 

It has even been known to rise to 2½ lbs.

Popsy estimates 2 lbs. amount of carbohydrate daily about 2 lbs. from protein is 2½. Then a diabetic is eating 2½ lbs. of sugar daily. It is very unlikely that he is getting any carbohydrate in his diet. If he were getting 2 lbs. of sugar per day then his insulin & Popsy's estimation would only yield by the age 2½ lbs. The remaining 3½ ounces he would have to be accounted for in coming from these proteins - we leave the question aside as to whether sugar can be derived from fat, if the diet is low fat - or such an enormous loss of body tissues & produce his huge amount of sugar at once makes the claiming of process ridiculous.

That sugar is derived from protein in the diet or from hydrolysis there can be no doubt. Sugar extraction in some cases of Diabetics whom many regard as the rest of the family pastured for the large or lot of the nothing at all practically, the sugar may be same in the weight cases. Right-they were showed little difference in a lot of 7 tissues disintegration may be only to look at the great manipulation extracting again 10 lbs. large amount of the tissues liberated. Which in the presence from an individual. By forcing these enzymes to manipulate from coming from the diet, the amount derived from tissue change can be estimated to prove that these come from the Diabetics & the cells. 

In conclusion evidence of tissues disintegration that sugar from diet is an instant & most awesome but another explanation is needed in it here & in the intestine.
Sugar production is brought about. The tissues for a long time perhaps have not had the normal capacity for utilizing sugar. Despite this fact, vast large quantities are circulating through them, sugar is incapable of being used. And carbohydrate in an essential for general well-being, food use is not. This is still the craving for carbohydrates, yet it is in abundance. In the writer's opinion the true production of sugar may well be due to chemical messengers to the brain. Abnormal tissue metabolism or disintegration may give the blood such a changed chemical quality as to cause the brain to put forth greater power of secretion. Again the material from which the brain cells build up sugar may be the product of disintegration of the tissues rather than that sugar in cleared off from the waste product metabolites, for reasons already given.

The conclusion arrived at thus are, that in Diabetes in its grave form, leaving the possibility of a reverse cause aside, one must be great changes functional or otherwise in the Pancreas & brain. That if this be any nerve lesion solely to be a cause, it is only in so far as it has wrought permanent disarrangement on the Pancreas & brain. That the increased motor theory as to the causation of Diabetes does not satisfy the condition seen in the grave form. That the basic influence of sugar is not to yield further sugar as a cleaved off product from protein matter. That in the early stages of the disease the necessity of sugar may be due to either intense secretion by the brain or some
degree of failure on its part to find means to reduce or reduce irritation on going to slight interference with the function of the pancreas, which declares this danger is controllable by cutting off carbohydrates from the diet.

But, in the later stages, when the pancreas has completely lost its function, the greater excess of sugar in the blood is due to insufficiency of the liver. To use it, the liver, greater conduction by the liver.

When we come to the treatment of a disease the pathology of which is so shrouded in mystery, it is not to be considered at least it is unsatisfactory. It is not so much treatment that is tried, or so much on what facts can be learned from the effects of treatment. There is no drug which gives any response, but if we might add a doubtful exception, it is opium in its derivatives. All the so-called cases are merely tempering agencies. As that, if there is any treatment at all, worthy of the name, it is the dietetic treatment, even from its limits in many cases the limit is a cruel one. In dietetic of no simple alimentary description, where the glycerine is completely controlled by cutting off the digestive carbohydrates, it is found that after a long complete abstinence from carbohydrates food, the power to assimilate carbohydrates returns in a greater degree, more or less. Before the dietetic treatment, I never thought. Some fruits of this way. When the mine keeps free from sugar on a strict diet. The patient began to lose weight.
to have a feeling of non-well-being, it may largely be assumed that power for carbohydrate assimilation has returned. So when carbohydrate is cautiously given up to the point a little beyond it, then no sugar appears in the urine, the weight rises, the patient feels well. This power, gradually acquired, of being able to dispense with a substance which prior to treatment was injurious, is interesting from the point of view of the pathology of disease. Here we may assume that more influence than the cause of the disturbance by causing irritation of the hepatic cells, merely a mere hypooxidation of sugar, then we might also assume that, after say, two months' treatment by dieting, the more influence of central tendency might be still the same or more probably greater, so that the giving of carbohydrate food might be followed by the same increased oxidation or liberation of sugar. As if we apply the Rake, then bring it back each case it might be said that during the period of abstinence from carbohydrates the same influence meeting the tissues supplying the glyco-protidic elements to the liver present a real, when carbohydrate were given we should still expect to find the same amount of disturbance. But if it is found that after prolonged abstinence, the body seems to have gained a power in this direction varying in many cases of course, whereby carbohydrate food in better health and the symptoms which previously existed leave. The patient begins to have the feeling of losing weight uniformly.
The first mean must in both cases be secured, or else able to utilize sugar, but that portion of it treated the same has seldom been passing the too much varying & irritating and more likely prove to inactivity to change sugar into glycogen through the influence of the Pancreas being impaired. It is probable that the Pancreas has gained some power to act in a greater degree as though it in this weakened. The Pancreas can be exhausted by the extravagant use of starch, as for as Pancreatic juice production is concerned. The same may apply to the internal digestion. This may possibly explain the origin of more or less where the contents of the carbohydrates & sugars have not been digested, hence the resulting cause. For long, perhaps, the Pancreas has been entirely diminished & unable to return to regurgitate & the human is unable to utilize the essential quantities taken with the Starch, but the Starch ultimately the continued fate of the sugar tends to the digestive process, so that gradually more & more sugar in being absorbed by each ingestion till at last symptoms call for medical aid. Then the condition of things is altered. When, then, the cause of all these symptoms is removed, & the excursion back of the Starch is prevented, then sufficient influence enables the gland to gain back partial power & contra- regulation is secured to result from the amount of sugar food.

But at one time constant to taken without its presence being realized in the veins, can be taken up & a certain

...
limit with moral effects. 

And in cases where abstinence from certain amounts of carbohydrate food has been acquired, it is only reasonable that once an amount can be bore, it should be given to any one who has observed the beneficial effect of such treatment. On these bodies, it seems nothing more can be made an essential part of the treatment. But those of the cases which come under the greater category of diabetes, in it counsel treatment to give to patients who have a plethora of sugar in their systems, which cannot be used— which is certainly doing much injury— is it correct treatment to give both cases more or less insulin? The first right of the question is to in the negative for it better an of by so doing heat fuel to being added to fire. The practice in gaining ground however, of giving each case a limited supply of carbohydrate food. It is true that certain forms of sugar are less injurious to the diabetic than other forms; but the additional can be much better tolerated than diabetes. But one would hesitate to giving sugar. Whatever its form, is a diabetic who is fasting long enough, much in his urine. The writer cannot hope expressing the belief that Tarry's idea is the correct one. When he asserts that the only cases suited for the administration of carbohydrate are those when the bodily system has shrunk, after a trial by abstaining from such diet, that diet can tolerate the same & & to give as much as, no more than, with abating the latter 

Exclusion of carbohydrates from the diet tends to blood acidity is not too slight. If bad this is a condition that can often in a lesser degree in health under like circumstances, again its has not been found that the aid condition of the blood is the cause of Diabetic coma. If the coma is due to toxic agents developed owing to faulty chemistry, not of acidity. Then it is possible that the correct exclusion of carbohydrates is the correct treatment. On the other hand one must not be oblivious to the fact as has been shown, that judicious treatment with certain carbohydrates is beneficial. I'm in interesting from the point of view as to where then the weak link in the chain, if, as I'm Gordon says in speaking of the success attending the treatment of Diabetic, or certain of them, with alcohol, the "Diabetic- temporarily at least- is able to regain power."

A combination for one particular carbohydrate or not for smaller quantities of various carbohydrates contained in ordinary food - if that be so, what form does the Carbo (2) hydrate in such later assume in the blood? Dr. Bay says that the sugar in the Portal blood from a liver capillaries, conditions from more may be other sugar from glucose merely. In this hypothesis other blood it is glucose, coming from most blood sugar to in the form of glucose it would seem to be immaterial what from the Carbo -hydrates of the food is coming that after it has passed the liver. But it acts as glucose. If, as in every belief, the assimilation of carbohydrates take place in the lymphatic system in the intestinal

U. Williamson 348. (2) Physiology of the Carbohydrates (Ox) page 90
Fist, then, how relative power of the Diabetes might have something to say for itself, but at first, the patient cannot command acceptance. What the true explanation is, it would be difficult to say. This much can be said, that certain cases can get well as far as sugar elimination is concerned, treatment whatever it be. The writer is forcibly reminded of a case of severe Diabetes where polyuria + glycosuria lasted entirely + where the case terminated in two months from Phthisis Pulmonalis.

Organotherapy has been a failure in the treatment of Diabetes. Thyroid gland + suprarenal body can command certain ailments in the body, but Pancreas given by the stomach, injection or Pancreas extract yields no beneficial effects in Diabetes. Despite the failure attending the use, it may be within the bounds of possibility to get some good results from the use of Pancreas gland. When the correct method of use is known. If dead pancreas gland or cooked gland + the prepared extract do not yield the results we might expect, it may quite possibly be due to the difference between a living + a dead pancreas. The effect of the abdominal graft has only to be recalled to explain what is meant by Mr. Statement. Mention has been made of the aterosclerosis in connection with the retention *pancreatic juice. Detecting pancreatic meconium membranes has no effect on this retention, when it is injected into the blood, but the same detection mixed with albumo-hydro-chloric acid acts at once. The writer contines in next term-
As is pointed out by Mr. Pancreas, the production of necessary something which the organ produces for metabolism in the properly conducted in the body, some chemical substance in the blood stream may be the necessary requirement. If the gland is to perform this important function, then what is in itself a mighty reason for believing that the parts are not difficult to find. There is no evidence of the graft, also the fact of the aid with the pro-duction of the necessary components for the absorption of both of which the complementary substances are required before the normal effect is reached. When the complementary body of the pancreas secretion is known, then treatment with the gland substance will be feasible.

In this connection there is another theoretical method of healing Diabetes. That is artificial grafting of a portion of the Pancreas of the lower animals. This operation has been performed actually, but it was a failure, as coma developed a day or two after the operation. Williams 3 says that the difficulties that stand in the way of success in this venture are the lack of long or the difficulty of being able to say whether the Pancreas works in each individual case. If it could be certainly established that the Pancreas is the organ concerned in carbohydrate metabolism, then theoretically there need be no hesitation whatsoever. The initial cause of the glycosuria. If it be true in any case, to maintain influence causing excessive action of the liver cells or by lowering the function of the Pancreas.

(1) British Medical Journal Dec 1894.
Then the grant would be of benefit in forcing the question of
Supposing pancreatic secretion to make up for that
deficiency already existing in the Pancreas. In the same
manner it would be beneficial in those cases where pathological
changes are already present in the Pancreas.

Booting as the White Subject of Diabetic Maladies, all that can
be said in that its pathography is still a mystery, but from that
we write can gather the function of the Pancreas seems to be
lost which has most to do with the metabolism of carbohydrates.

Nutric in the body. That when this is in abeyance then the
symptoms as here in Diabetes assert themselves. This
does not preclude the possibility that tumor affectations have
a prime influence in the production of the disease. This
is very likely to be the case in many patients languishing
but according to the light we have on the subject the
permanent symptoms of Diabetes may only act in after
such tumor affections have completely disorganised the
organ disorganizing again. There is another possibility in connec-
tion with the belief that Diabetes originates from inter-
ference with the function of the Pancreas. That is, there
may be something contaminating in the blood which prevents
the function of the intestinal secretion. If diabetes were
reaction of the diabetic blood is supposed to be due to the
secretion of sugar present in it but it is interesting to note that
Williams instance a case of Diabetes lapsing into Phthisis

(1) Williams page 174.
Gave the Methylene Blue reaction. This suggests that there may be some other agent in the blood. It was the specific dye yielder the decoloration of the blood but whether this means the decoloration is due to some abnormal by product of metabolism or if the absence of some normal one, is impossible to say. The test in concentrated form is by the fact that when the reaction is carried out with normal blood in both quantities as well represents the amount of color in diabetic blood, decoloration follows, but whether the disease is ever due to a lack of something in the blood is not, the graph shown to show that there must be something normally in the circulation which is absolutely necessary for the pancreas performing its function.