Diabetes mellitus from the Perspective of Anthroposophical Medicine

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Abstract

- On the background of the three-fold human organism, type 1 and type 2 diabetes mellitus appear as a polarity. In type 1 diabetes action of the nerve-sense system is dominant. In type 2 diabetes action of the will in the metabolic-limb system is restricted. In terms of the human biography, type 1 diabetes appears linked with insufficient incarnation of the soul and spiritual being, type 2 diabetes with premature separation and excarnation.
- Conventional therapy focuses on what can be measured and regulated, i.e. the glucose level. In this way it addresses the physical plane but fails to address the soul and spirit aspects of the illness—the disease process itself. Through its perspective on disease, anthroposophical medicine is able to develop therapeutic aims and concepts that go beyond regulation.

Key Words

Diabetes mellitus type 1 and type 2

Insulin

Insulin resistance

Diabetic nephropathy

Diabetic retinopathy

Autonomic diabetic neuropathy

Polyneuropathy

Diabetic foot syndrome

Rosemary

Introduction

In diabetology the therapeutic approach has focused on regulating blood sugar to within normal levels, and with commendable results: A disease known for over 2,000 years can now be effectively managed and regulated. The underlying pathology is understood as a disorder of biochemical and—increasingly—molecular biological processes. Yet the deeper question remains as insistent as ever: How do the objective findings of science relate to the whole being of man, embracing not only a physical form but also soul and spiritual dimensions? In this sense the approach of causal analysis needs to be broadened. The life of those suffering from disease is lived on these multiple levels at every instant; and when illness so deeply impinges on their lives and biographies, the above question is alive in them whether or not they express it in words. Medicine must ask itself whether pursuing this question is "merely" a service to the patient's subjective sense of well-being or if it might not lead to new paths in the therapy of diabetes. Will our therapeutic task regarding diabetes mellitus be accomplished when with our growing arsenal of therapeutic tools we succeed in producing glucose profiles matching the "healthy norm"? The answer is clearly "no." The actual disease process remains untouched by such medication. We have merely gained control over consequences of the illness and thus reduced the risk of further injury. Man is a being oriented towards becoming and developing; and when this is recognized, illness is never simply a "mechanical failure." Symptoms challenge the sufferer to make illness fruitful on the plane of inner development. An ideal therapy, in the process of exerting a positive influence on the disease process, would also mediate related steps in inner development. Healing, in this sense, goes beyond finding-oriented therapy. Along with its positive effect of preventing typical diabetic complications, the regulating approach introduces the risk of arresting the disease and "freezing" development. For this reason the choice of further therapies to accompany the regulation process it is of critical importance.

In 1922 for the first time a child was treated with insulin. In 1923 Banting and MacLeod were awarded the Nobel Prize for their discovery of insulin (1). Parallel to these developments, in 1920 Rudolf Steiner began to give indications on the treatment of diabetes—indications that have remained in their germinal form, undeveloped, to this day. Alongside of soul-spiritual aspects they entailed an unusual external (medicinal) approach. Understanding and developing this will require extensive work. Perhaps one day the qualitative measures of a medical art will occupy a place alongside of the regulating measures of conventional scientific medicine. A large part of the task will certainly involve developing appropriate prevention in face of the obvious influence of the factors that contribute to manifestation. The prerequisite for this is an understanding of diabetes that recognizes higher "members" of being in the human organization and develops a therapeutic approach based on this understanding.

2. How Individuality Acts in the Organism

On the foundation of the nerve-sense system, the inner being of man gains awareness of itself and the world. The colorful world of the soul and the multiplicity of sensory impressions all become conscious. Over against this thrust towards consciousness, however, the soul has another orientation which takes hold of the organism in motor and metabolic processes. The picture of the human being on which present-day medicine is based fails to see beyond the connection of inner experiences to neuronal structures. To put it positively, it is solely aware of the relationship of consciousness to the nervous system and conceives of the rest of the organism as soul-less. The criterion of brain death is based on this kind of picture. In reality every dynamic process or movement is the continuation of an inward intention; in it the inner world of the human being engages directly and immediately in the metabolic and motor organization. Only consciousness and the form-giving quality are based on the nerve organization. It is the astral organization which makes a living organism into one that is wakeful and conscious; in the upper pole of the human organization it is chiefly a vehicle of consciousness, while in the lower pole it lives chiefly in metabolic and motor functions. *Consciousness* and *movement* manifest its polar qualities. Consciousness arises through a metamorphosis of life-forces. These act in the organism's life processes of growth and regeneration, but they can also be transformed into forces of consciousness. Here, in the domain of waking consciousness carried by thought, the astral organization has one thrust of its activity. The other, associated primarily with the lower pole, leads to metabolic processes in the life-realm which—in the case of movement, for example—may have a warming quality akin to inflammation (see below).

I-Organization and Sugar Metabolism

Each human existence poses the question how the inner being is connected with the physical body. Rudolf Steiner addresses this question while discussing the relationship of the I-organization to sugar: "Wherever sugar is present, I-organization is present; wherever sugar arises, the I-organization appears in order to give a human orientation to sub-human (vegetative, animal) corporeality" (2).

A vast gap seems to separate these two worlds, and no connection is readily evident. Here we shall explore one of the possible ways of

illuminating this issue.

First of all, it is obvious that the narrowing of our attention to the ponderable aspects of substance has only made the riddle of this connection greater. The focus on dimension, number and weight reveals a material world which occupies space—the conventionally accepted "reality"—yet at the same time further obscures our view of the spiritual. This ponderable side of substance has a complement in its imponderable qualities, which are manifested in their processual action. In this connection it is revealing to observe how the sugar metabolism—particularly the action of glucose—affects the metabolic processes of the animate organism. It is the qualities of consciousness and movement that are most closely connected to sugar metabolism. Consciousness develops on the foundation of the nerve-sense system and—as any hypoglycemic knows—manifests a dependence on glucose metabolism. Movement too, as a phenomenon of the metabolic-limb system, is realized on the foundation of sugar metabolism (see below for detailed discussion).

Thus the essential manifestations of the sentient (astral) organization in the three-fold human being are connected with the sugar metabolism. In man as distinct from the animal, however, the two domains of consciousness and movement undergo a further enhancement through the individuality. In man, consciousness rises to the possibility of self-consciousness, and movement is subject to the conscious intention and control of the I. Thus the human qualities which have their organic basis in sugar metabolism point towards the I-organization.

A metabolic pathway that has been known for over a century is that of glycolysis. In 1897, Eduard Buchner succeeded in demonstrating that a cell-free extract of yeast can undergo anaerobic fermentation of sugar resulting in alcohol (3). In glycolysis, glucose which tends towards mineral crystallization—i.e., the physical level—is raised through a metabolic process to the fluid-etheric level. Given sufficient oxygen, the glycolytic breakdown of glucose does not proceed all the way to the lactate stage, but only to pyruvate, which can be oxidized to carbon dioxide in a fundamental reaction sequence. This opens the metabolic pathway of glucose to the air organism as an instrument of the astral organization. The essential connection of this metabolic pathway of glucose to the I-organization, however, resides in its serving heat and energy metabolism. The human I-organization lives in the warmth that so abundantly results from this. Substance dissolves into process, developing in its imponderable qualities towards the human spirit and becoming permeated with its life, soul and spirit. As Rudolf Steiner formulated it 1922, "the human being must have the power to dissolve sugar; his life consists in this" (4). Impairment of this power points towards the disease of diabetes. The instrument of the I-organization becomes inaccessible to its action, thus mineralizing and crystallizing in the deposited glucose whose toxicity is now so well understood.

Blood Sugar Regulation on the Background of the Threefold Human Organism

Blood sugar regulation is regarded as a function of the interplay of various endocrine hormones. It must be recognized that this view is limited to the metabolic processes in the organism which can be described in biochemical terms and offers no link to the soul and spirit aspects of the human being. Accordingly, any therapeutic approach that confines itself to the plane of blood sugar regulation always risks ignoring the inner being of man. Even a cursory look at the regulation of glucose levels, which are generally constant within narrow limits and also nearly age-stable (5), gives evidence of the soul and spirit being at work in the threefold organism. Elevations of the glucose concentration may be associated with endocrine changes in any of the following: the pancreatic glucagon (belonging to the metabolic system), the cortisol of the adrenals (more closely connected with the soul process of waking-up), the thyroid hormones (serving the unfolding of soul-spiritual life), the catecholamines (intimately linked with the development of consciousness), or stress-conditioned secretion of STH. The result is an elevation in blood sugar in connection with a soul-spiritual being oriented towards waking, i.e. to the upper pole of the human being. On the other hand, a depression of blood sugar levels is registered with every muscular movement and particularly with athletic activity. Thus when the soul-spiritual entity realizes its intentions in limb movement, it leads to a depression in blood sugar concentration as glucose is drawn into the warmth-linked metabolic processes of will activity. In summary, when the inner human being is oriented towards the nerve-sense system, a rise is observed in the glucose concentration in the blood, whereas when it is active in the metabolic-limbs system, a decrease is noted. In the first case—orientation towards the upper pole—blood glucose is "deposited" (in a relative sense). As it falls away from the higher members, the crystallizing tendency of the glucose results in a subtle sal quality permeating the organism. This can even become pathogenic in the sense of glucose toxicity. Taking HbA1c as a parameter for this depositing quality linked with the upper pole, it is of interest that HbA1c (study on 4,662 men) is associated with a death risk whether or not it exists in the context of diabetes, apparently without any threshold value. According to the study, a 1% rise in this parameter was associated with a 29% increase in risk of death for all causes, independent of other known risk factors (6). In the second case the glucose is taken up into the warmth and will-activity of the higher members. Glucose's sal quality and its sulfuric

action_substance is transformed into process_are now mediated by a rhythmic quality. As early as the 20's of the last century, an oscillation of the fasting blood sugar was described (7). Later, a temporal correlation between rhythmically spaced insulin secretion and plasma glucose was mentioned (8).

In this way the spectrum of glucose metabolism, ranging from crystalline glucose to its dissolution in the warmth processes of the human

organism, finds its place within the threefold human organism. Thus our characterization of diabetes is further differentiated as we chart its relationship to the generation of consciousness and will activity by man's soul-spiritual being.

3. Polarity in the Clinical Picture of Diabetes mellitus

Physiological Foundations

The clinical pictures of type 1 and type 2 diabetes display a striking polarity, especially when juvenile diabetes is juxtaposed to the type 2 diabetes of the adipose adult (formerly 2b). Although in principle both forms of diabetes can occur at other periods of life as well, the primary incidence of insulin-deficiency diabetes is from childhood through early adulthood, while type 2 tends to fall in the second half of life. Besides this age difference in the occurrence of the disease, there is another clinical aspect.

A young man of about 17 has been recently diagnosed with type 1 diabetes. He is presently preparing for his *abitur* exams. For some weeks he has appeared pale and unwell. He complains of insatiable thirst, fatigue and weakness, and has lost approximately 15 kg. The patient is dark-haired and of gracile body type. Following diagnosis, his primary care physician has sent him to the hospital for primary care and insulin regulation (ICT).

The other type of diabetes presents an almost complete contrast: A 55-year-old female teacher, quite overweight, has for decades been in treatment for diabetes by her primary care physician, most recently due to loss of efficacy of sulfonurea medication and the need to begin insulin therapy. In complete contrast to the first patient, she feels energetic and healthy has trouble accepting the concerns of the physicians regarding regulation of diabetes and hypertension. She has a strong constitution and appears healthy, with red cheeks. While she is essentially a sociable and good-natured person, a streak of emotional impulsivity and instability are unmistakable.

These two typical patients present a polarity which can also be found in various other illnesses. Corresponding polar images are known in asthma, for example, where one sees the slender, asthenic patient alongside of the adipose one. This contrast also appears in "pale" and "red" hypertension. It is the disease polarity that reflects a dominance of the upper or lower pole of the human organization and can be described as the neurasthenic or hysterical disease type (in clear distinction from psychiatric terminology). Lab results on both types of patients reveal pathologically elevated glucose levels, and in some instances equally pathological HbA1c. Contemplating the further phenomenology, one views the full span that makes up this polarity. In the area of the life organization, there is the frailty and cachexia of the type 1 patient over against the vital appearance of the adipose type 2. In the feeling life one frequently encounters the contrast between a wakeful psyche that may be exhausted and overtaxed by consciousness, versus an emotionally oriented and sometimes impulsive dynamic. In the first case, the individuality is threatened by a lack of strength for its development, in the second by an emotional dynamic frequently experienced as overwhelming.

The patho-phenomenology outlined above provides a basis for venturing a comprehensive picture of diabetes.

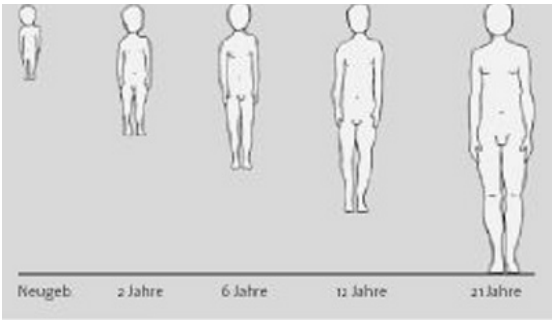
On the physical plane, our attention is drawn on the one hand to the pancreas organization and on the other to the peripheral phenomena of insulin resistance, which have now been clearly determined, partly in connection with the musculature. The new classification of diabetes adopted by the American Diabetes Association (ADA) and by the WHO in 1997 (9), which supplants the preceding one, recognizes this polarity in that it contrasts ß-cell destruction (type 1) with insulin resistance (type 2) accompanied by insulin deficiency (usually relative, less often absolute).

4. Type 1 and Type 2 Diabetes mellitus

In its various forms, the disease picture of diabetes mellitus points with particular clarity to the three-fold human organism. Thus, the primary phenomenology for which the disease was named is situated in the metabolic realm. On another plane, the rhythmic system is affected in a variety of ways, ultimately extending to atherosclerotic alterations of the vascular system, which is particularly informed by rhythmic processuality. Finally, there are the unmistakable alterations in the nervous system and sensory organization.

The predominant age of manifestation is a clear initial indicator, falling as it does either in youth or in adulthood. The other forms of the illness will not be discussed in this connection. Childhood is the age of predominance of the nerve-sense organization; hence at this age we encounter type 1 diabetes, whose clinical picture clearly reveals the predominance of the upper pole. In temporal succession to the infantile dominance of

the nerve-sense system comes the development of the metabolic-limb system. As we shall elaborate below, at this point the essential phenomena of type 2 diabetes manifests themselves as a disease picture in which the metabolic-limb system takes center stage. A cause for concern is the apparently increasing frequency of this "senile" form of diabetes in young patients, some under 20 years old.



newborn 2 years - 6 years - 12 years - 21 years

Fig. 1a: *Metamorphosis of the human body shape, with the transition from nerve-sense dominance to increasing limb-development. The maximum manifestation of diabetes type 1—between age 14 and 20—coincides with most intense limb development. (From:* Husemann A. Der musikalische Bau des Menschen. Entwurf einer plastisch-musikalischen Menschenkunde. Verlag Freies Geistesleben, *2nd Edition 1989)*

4.1 The Development of the Threefold Human Organism and Type 1 Diabetes

The development of the threefold organism provides significant support towards understanding type 1 diabetes.

In childhood the entire organism has the gesture of a sense-organ. It has not yet developed an independent metabolic organization possessing its own space: "First of all, one needs to recognize that in human childhood, specifically in the earliest childhood of the human being, the entire constellation of the three systems is different than in later stages of life. In childhood we have a human organization in which the nerve-sense organs penetrate much more intensively into the two other systems than in later life in the human being. In a sense the child is really all sense-organ" (10).

Being a sense-organ also means that the child's being still lives completely in its surroundings, in the periphery, and only gradually masters the inner world of its body. Much as embryonic development proceeds from the periphery of the developing embryo, which is only gradually taken hold of in the various processes of invagination, a similar gesture prevails on the functional plane in childhood, moving from the periphery towards increasingly autonomous existence. "When the child is quite young, all development proceeds from the head. When the change of teeth is over..., then all development comes from the chest. ... And only when the human being has become sexually mature does development proceed from the whole human being, from the limbs" (11: Rudolf Steiner's lecture for the workers at the Goetheanum). Of course this infantile preponderance of the head organization does not imply a dominance of the forces of consciousness. At this stage these forces still must remain asleep, to awaken only much later. What we are speaking of are the formative life forces, which in the infantile organism unfold primarily in the head and sensory organization, removed from consciousness, and take hold of the rest of the body only in the further course of development. It is the path from a sensory system open to the periphery, to the development of an interior bodily space. The emanation of development from the head organization is vividly manifested in the changes of bodily form from childhood to adulthood (fig.1a). The increasing formation of the limb organization is easily recognized, and a corresponding gesture can be read in the formative metamorphosis of the skull: Initially, development of the neurocranium dominates, with a small facial skull and a narrow limb area of the maxilla and (primarily) the mandibles. Then there is more intense development of this limb-related organization (fig.1b), which recedes again in later life, particularly in the phase of old age. This formative metamorphosis quite visibly reflects the path of incarnation and excarnation of the spiritual individuality, becoming the outward gesture of an inner, spiritual process.

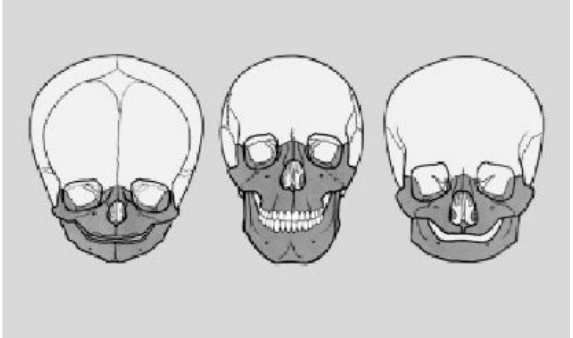


Fig. 1b *Formal metamorphoses of the head organization. The initial*

Fig. 1b: *Formal metamorphoses of the head organization. The initial form is determined by the neurocranium. The limb organization develops as an "addition" to this and recedes again in advanced age, regaining a form corresponding to that of the infantile head. (From:* Waldeyer A. Anatomie des Menschen, *Part 2, 11th edition, de Gruyter, 1974)*

The peak incidence of type 1 diabetes between the ages of 14 and 20 (12)_preceded by a clinically undetected phase of disease prior to manifestation_falls in the period of human development during which these critical transformations are taking place in the threefold human organism. If the metabolic-limb organism is not completely taken hold of in this process, it remains in a comparatively "infantile" configuration, creating the disposition to type 1diabetes. A significant signal in this connection is the increased frequency (by approx. 5%) of celiac sprue among type 1 diabetics, which also points to deficient action in the metabolic organization. Autoimmune thyroid disease, which is more frequent in the context of type 1 diabetes, points in the same direction (13, 14). Also worthy of note in this context is Mauriac Syndrome, described by Pierre Mauriac in 1930 as a combination of dwarfism, hepatomegaly and delayed puberty (followed by hypogonadism) in juvenile diabetes (15). Today this syndrome is an absolute rarity and certainly a tragic expression of poor control of the metabolism. It underscores how short stature entails delayed puberty as a deficient limb-orientation of the higher bodies (particularly the astral organization) and thus supports the picture of diabetes that we have outlined. This places type 1 diabetes in a context that Rudolf Steiner characterized as deficient "engagement of the I in the organism," which normally takes place in the period between the change of teeth and puberty, "culminating between the ninth and tenth years" (16).

Lymphocytic Insulitis

The pancreas, the organ essential to the action of the I organization in the metabolic system, is abandoned by the action of the upper bodies. As when any foreign entity appears in the organism, this can become the cause of inflammation_in this case an autoimmune response in the form of lymphocytic insulitis. Rather than healing, the inflammation becomes chronic, ultimately leading to sclerosis and destroying the endocrine system. Of interest in this connection is the protective inflammation which is supposed to be the counterpart of a destructive inflammation leading to chronic inflammatory processes and ultimately to sclerosis of the organ. From the present approach what is important is not to see the pathogenesis exclusively in terms of the functional loss of a physically conceived endocrine organ, but to understand this physical disease manifestation as an expression and a consequence of pathological action on the part of the higher constituents of the human organization.

Etiological Considerations

On the background of the higher-body constellation in type 1 diabetes, as we consider the factors contributing to deficient action of the higher members in the metabolic-limb system we must also take into account the influences which transform life forces prematurely into forces of consciousness and thus promote development of the constitution associated with type 1 diabetes. These are influences which either hinder the necessary incarnation of the higher members in the metabolic-limb organization or cause them to disengage again after having achieved efficacy in this region of the three-fold organism.

Of interest in this connection is a Swedish study comparing 338 children with diabetes to 528 children of a control population to determine the influence of highly impacting life events such as death of a close relative, divorce of parents or change of home. The authors found that among 5- to 9-year-old children with diabetes, loss of one parent prior to manifestation of the disease was more frequently observed than among healthy children. The difference, however, was was quite small, a factor of approx. 1.8 (17).

Particularly with early manifestations of diabetes, however, the causes hindering a normal grasping of the metabolic organization may be related to destiny, stemming from a distant past in previous earth lives. At the same time the comparatively minor role played by genetic factors forces us to seek largely unknown pathogenic factors that may be inherent in the conditions of present-day child development. In this context the growing incidence of type 1 diabetes should certainly be a cause for grave concern, teaching us to pay greater attention to causes lying in the soul-spiritual "developmental climate." Thus, excessive transformation of life forces into consciousness forces is related to later appearance of diabetes chiefly in adults with a slender constitution (formerly classed as type 2a), as we shall discuss below.

Prevention

This picture of type 1diabetes opens the question of prophylaxis for a disease whose manifestation appears to be promoted by the most various "environmental factors," a disease that appears in twins with a concordance rate of only 36% (18). What can hinder the action of the higher members in the metabolic organization? In terms of the picture we have outlined, over-powerful engagement of the forces of consciousness may be a factor. This is called forth by non-age-appropriate intellectual taxing of the child or by violent and frequently repeated emotional upheavals, which draw the action of the higher members out of the metabolic organization (where they are removed from consciousness) into

upheavals, which draws the action of the higher members out of the metabolic organization (where they are removed from consciousness) into the nervous organization. As a fundamental consideration, this will surely have a bearing on late disease manifestation and type 2a patients of the old classification (see below). Rudolf Steiner speaks in this connection of the damaging effect of excessive memorization and taxing of the memory forces in children (19). He speaks in a similar way of the influence of emotional upsets, which, and this applies to adults as well, "can be connected to a high degree with the development of diabetes" (20). These phenomena will be discussed below in the context of the metabolic syndrome. How relevant such factors may be to studies pointing to higher incidence of diabetes in low social status residential areas (21) remains to be determined. In any case, the significant role played by non-genetic factors in the development of type 1 diabetes is clearly demonstrated by its low concordance rate in monozygous twins.

At the same time we are challenged to investigate the largely unknown factors contributing to the manifestation of diabetes, and the connection described here may provide orientation. In this regard we must insert a comment on type 2a diabetes of the old classification. In many of its phenomena, it displays a polar quality to the type 2 diabetes to be described below, yet its pathology is close to that of type 1 diabetes, indicating that it must entail a related constellation of the physical and higher bodies. The patients affected by this form of the illness, which manifests primarily in adulthood, are not adipose but frequently of slender body build. In contrast to adipose diabetics they are not characterized by abundant vitality, in fact tending to have a rather gaunt aspect. The metamorphosis of life forces into mental forces is frequently conducive to a psychological makeup favoring exactness or even pedantry, the kind of patient who might keep long annotated lists of carefully recorded daily blood sugar levels. Thus on the psychological level we encounter a striking contrast to the adipose diabetic and to patients with metabolic syndrome, which will now be described.

The question is whether some type 2a diabetics (old nomenclature) might not be "hidden" type 1 diabetics. Here, Rudolf Steiner's indication on overtaxing of the memory and intellect gains a broader biographical perspective which he saw with great clarity: "We must develop the ability to enter into the human being in a soul-spiritual way. Then we will recognize that in a child, around the ninth or tenth year of life, let us say, the faculty of memory can be called on too much or, then again, too little. On the other hand, such inveighing against overtaxing the memory can just as easily lead to undertaxing it. In everything the middle road must be found, calling on the memory not too much, not too little. Imagine that around the ninth, tenth year of a child's life we ask too much memory work, we require too much of the memory in education, in the classroom. The actual consequences will not become apparent until this person is thirty, forty years old or perhaps even later. At that point the person will become either a rheumatic or a diabetic. It is precisely by overtaxing the memory at the wrong time, let us say between the ninth and tenth years of life, that this overtaxing of the memory in childhood will later manifest in excessive deposition of wrong metabolic products. ... On the other hand, if we put the memory to work too little, failing to ask the child to commit a sufficient amount to memory, at a later age we are calling forth all manner of conditions with a strong tendency to inflammation. To understand how the bodily conditions at one age can be the consequences of soul-spiritual conditions of another age of life_that is what is important, that is what we must know" (22).

4.2 Type 2 Diabetes mellitus and the Metabolic Syndrome

In recent years the significance of what is known as the metabolic syndrome in the development of diabetes has become clearer. The term refers to a constellation of insulin resistance, hyperinsulinemia, hypertriglyceridemia, arterial hypertension and abdominal adiposity. Additional findings associated with this constellation make metabolic syndrome an extremely complex disease picture. This illness, which already displays insulin resistance, is assumed to transition through impaired glucose tolerance into type 2b diabetes mellitus of the old classification.

Metabolic Syndrome

What picture can be developed of metabolic syndrome? To begin with one can contemplate the phenomenon of insulin resistance. When this is present, more insulin is needed on target tissue in order to achieve an insulin action than on non-insulin-resistant tissue. Applied to glucose, insulin resistance can be interpreted as a glucose absorption disorder. In addition to the liver and sites such as the fatty tissue, this phenomenon is encountered in the skeletal musculature of the human being, i.e. in the movement organization. This in itself makes it possible to link a discussion of metabolic syndrome to inner aspects of the human being. What are the peculiarities of the will, which creates an instrument for itself in the movement organization; and what is the significance of movement in which the will expresses itself? Here it is of special interest to note that insulin sensitivity can be markedly improved by movement. In a monitored movement program, a significant decrease in insulin resistance was evidenced. Furthermore it could be "very convincingly demonstrated that regular physical training can in fact prevent later occurrence of type 2 diabetes" (23). If, in describing this syndrome, our attention turns to the inner human being, the following picture of metabolic syndrome may result:

When the human will adequately takes hold of the metabolic and limb organization, there is no disorder of insulin sensitivity and thus no disorder in glucose absorption by the musculature. When its efficacy in the movement organization is inadequate, insulin resistance develops. In the context of an inadequate limb impulse, adiposity (primarily abdominal) may develop, since the "consuming power" of the limbs is too small (24).

Alongside of primary insulin resistance secondary forms can be distinguished. Of interest in this connection is insulin resistance in hyperthyroidism, with its psychological orientation towards consciousness and tendency to restriction of the limb sphere to the point of possible thyrotoxic myopathy. The astral body and the I also withdraw from the movement organization, making their presence felt as restless, tormenting forces of consciousness (25). In the case of cirrhosis of the liver, sclerotic disease in the metabolic system impedes the action of the higher members, resulting in insulin resistance. A revealing point of comparison in this connection is with pregnancy: Here too the higher levels of the human organization withdraw to make room for the development of new life. In this situation, what could be called a physiological insulin resistance arises. This casts light on gestational diabetes. In parenteral feeding as well, the higher bodies dissociate themselves from active engagement in the digestive tract and insulin resistance is observed (26). Yet another example of dissociation of the astral body and I organization is the rising insulin resistance of advanced age (27), paralleling the excarnation of the self.

With the withdrawal of activity from the limbs, associated with metabolic syndrome we observe the development of a fat metabolism disorder that is susceptible to *movement-dependent* influence. Now that a differentiated phenomenology has been developed for metabolic syndrome, at first identified merely as group of four factors, it has become possible to follow the constellation of the higher bodies exactly in regularly diagnosed changes in fat metabolism. In the process, we recognize a conceptual sphere embracing the spiritual and physical at once.

Dyslipoproteinemia, aggravated by lack of movement, leads to an "atherosclerotic" constellation. The higher bodies increasingly withdraw from the metabolic-limb organization and push towards awakening, i.e. towards the upper pole. Other phenomena of insulin resistance point in this direction as well. High insulin levels are associated in certain conditions with increased activity of the sympathicus, which accompanies awakening. Any orientation towards consciousness is organically accompanied by a tendency to over-forming and solidification as a functional sclerotic gesture. Significant in this connection is the depressed EDRF production that has been linked to insulin resistance, which may point to restricted vascular dilation, thus making it one of the most discrete describable signs we have of over-forming and hardening in the vascular system. Likewise pointing in the direction of sclerosis are the frequently elevated fibrinogen levels in metabolic syndrome and numerous other hypercoagulation phenomena associated with them. Thus the withdrawal of the metabolic-movement impulse is accompanied by an increasingly apparent tendency to sclerosis and hardening. This is also corroborated by the observation that lack of movement is linked with an elevation of plasma viscosity and erythrocyte aggregation (28). The tendency begins in scarcely detectible phenomena of endothelial dysfunction and continues more openly in hypercoagulation, finally becoming manifest in changes in the vascular walls potentially reaching the stage of calcifying arteriosclerosis. It is the same disease process whose signature can be read to varying degrees in the blood and the vascular organization. The sclerotic quality that we have identified is also found in other areas of the metabolic organization. For example, the formation of *cholesterol* gall stones is more frequently observed in this context.

Changes in Soul Life

The emotional life of patients with metabolic syndrome frequently exhibits an excitability and impulsivity that may reach the point of emotional instability. It would seem that the soul dynamic which normally expresses itself in movement of the limb system, turns_when it leaves it, towards consciousness, entering the realm of feelings and emotions as a highly excitable psychic life. RR values showing a rapid rise in moments of emotional tension and declining significantly moments later belong to this picture as well. They cast further light on the characteristic hypertension of metabolic syndrome, which accompanies this disease picture from early on, quite in contrast to generally normotensive type 1 diabetes. In a study by Sung et al. (29), mental stress caused a greater increase in systolic and diastolic blood pressure in insulin-resistant women than in a non-insulin-resistant control group. One is left with the impression that as astral activity lifts out of the metabolic-limb organization and moves toward the upper pole, manifested in an excitable emotional life, it does not encounter commensurate forces of peace, level-headedness and structuring as qualities of the human I. This inherent will power of the individuality appears incapable of adequate efficacy. The I-organization engages insufficiently in the metabolic-limb system. Recent studies of metabolic syndrome have found visceral obesity associated with hypersensitivity of the hypothalamus-pituitary-adrenal-axis; increased cortisol secretion was observed within the daily rhythm. The adrenal glands are thought to secrete increased amounts of cortisol following ACTH stimulation. Furthermore, increased cortisol secretion was found in physical and psychological stress tests on patients with metabolic syndrome. Acute stress situations and poor stress management are associated with an activation of this endocrine axis. Chronic stress is thought to lead to a marked activation. Patients with metabolic syndrome often answer "yes" to the question after the stress test, complaining of states of anxiety, depression, sleeplessness and nightmares.

Body shape, soul life and the guiding power of the I

Adiposity can be described in terms of various aspects of fat distribution and body shape and has been categorized accordingly (increased total body fat, increased abdominal fat, increased deposits of visceral fat and increased gluteal-femoral fat tissue (30)). An essential relationship to soul life becomes evident here. In the study conducted by von Lapidus et al. (31), central adiposity (waist/hip ratio or WHR) in women revealed a positive correlation with the feeling of stress, sleeplessness and use of tranquilizers and antidepressants. In contrast, no corresponding connection to BMI (body mass index) could be determined. In fact, a negative correlation to the feeling of stress, sleeplessness and pill use was

found. In central adiposity we are dealing with a wakeful orientation of the psyche described as chronic arousal. The psyche tends less inwards than outwards, less towards introversion than towards extroversion. In generalized adiposity the astral body remains connected with the organism and does not yet dissociate from it. In central adiposity, however, the dissociation is evident: The rather slender extremities along with the changes associated with metabolic syndrome and type 2 diabetes point towards withdrawal of the limb quality. The astral body separates out of the lower pole of the organization and its dynamic pushes towards a state of psychic awakeness, i.e. towards the mid and upper human organization. The more frequent appearance of "hectic spots" on the upper thorax, neck and face may be a bodily manifestation of this; similarly, quickness to tears at emotional moments and difficulty controlling them point to glandular activity of the metabolic system in the domain of the sense organization. Another phenomenon variously described in this context (32) is that of inadequate coping skills in stressful situations and the feeling of "losing control." The I manifestly lacks the power to direct the overwhelming astral dynamic. Following the lead of Björntorp, Moyer et al. come to the conclusion that "WHR might be a somatic indicator of uncontrollable psychosocial handicaps and poor coping skills" (33). There is inadequate forming power on the part of the I; the mind imposes too little structure on the feeling and will life. Comparatively speaking, too little structuring power is evident in the soul life. This type of inner constitution was described as early as 1920 by Rudolf Steiner, whose description is quoted below. In the physical body, deficient inner structuring power is associated with a constitution conducive to the rounded forms that appear both in the form of central adiposity and also in the face_once again, an illustration of a diminishing formative and structuring quality in the human body. It was in this context_specifically, in discussing a constitutional tendency to obesity associated with an inflammatory symptom complex, that Rudolf Steiner spoke of a "disintegration" of the structural framework in-formed in the body by the I. As this framework bears an inner relation to the process of sight (34), this casts further light on the involvement of the eyes in diabetes mellitus (see below).

Waking and Sleeping in Type 2 Diabetes mellitus

As the excited astral organization is freed from the lower pole and pushes towards the mid and upper organization, it is accompanied by an activation of the sympathetic nervous system. In the early stages of diabetes, with the onset of sleep the astral body may be freed of the restless wakefulness of its day-life and enter into a night-time constellation. The observations of patients with metabolic syndrome mentioned above, however, point towards possible sleep disorders even at this stage of the illness. With the release of the astral body there is a decrease in blood pressure, which is dependant on the waking state; activity of the sympathetic nervous system diminishes and hemoconcentration also decreases slightly. In their study of type 2 patients with diabetic nephropathy, Nielsen et al. (35) describe some patients with sympathetic activation that persists—comparatively—in the sleeping prone position relative to the waking prone position; this is associated with little or no drop in blood pressure, rising noradrenalin and hematocrit, and unchanged adrenalin and melatonin levels.

In patients with essential hypertension, Pedulla et al. (36) describe severe impairment of sleep architecture with absence of the night-time dip in pressure (non-dippers). The sleeping soul-spiritual being evidently does not reach the deep levels of NREM sleep to nearly the same extent as in healthy sleep. This "flattened" sleep pattern is characterized by many short episodes of arousal reactions, which can be understood as abrupt transitions from deeper levels of NREM sleep to shallower ones or as a transition from REM sleep to waking. The length of these "arousal reactions," which are associated with EMG changes and/or increases in heart and respiratory rate, determines their classification as arousal (≥1Min.) or microarousal (>3 sec., <1 min.). The study found that these microarousals were significantly more frequent in all stages of sleep among hypertensive patients who lacked the nocturnal blood pressure dip. Taken together, these phenomena point to deficient nocturnal release of the astral organization. A higher-body configuration retaining a resemblance to wakefulness persists in sleep and may be associated with sclerotic processes. In this way the documented pathological relevance of "non-dipping" is illuminated by spiritual science.

The Activity of the Higher Bodies in Metabolic Syndrome and Type 2 Diabetes mellitus

In view of what was presented above, the following characterization of diabetes by Rudolf Steiner appears to apply to the "prediabetic" metabolic syndrome as well:

"Then again it simply cannot be ignored that with diabetes, to a greater or lesser extent we are dealing with essentially psychic causes and that emotional upheavals that a person goes through, if easily excitable, may be strongly linked to the arising of diabetes. The I is actually weak, and because it is weak it tends to restrict its activity to the periphery of the organism, to the brain through which it develops a strong intellectualism. But the I is not capable of moving deeper into the organism, where the actual processing of protein occurs. In its place, the activity of the astral body enters all the more into those areas that the I fails to reach.

"Now it so happens that these internal processes, specifically internal secretory processes, are themselves powerfully linked with the generation of feeling, with the emotional life. While the I is chiefly occupied with brain activity, it leaves unattended all activity that is of a secretory nature, which is essentially an oscillating, circulating activity. And it is in these circumstances that the human being loses mastery over certain psychic influences that express themselves as feeling influences.

“When we are active in an one-sidedly intellectual way, out of the brain, then the inner world makes its own movement. At such moments we are especially susceptible to inner upheavals, and as a consequence these upheavals evoke organic processes when they really should be doing something else. Properly they should not directly evoke organic processes as upheavals acting on the feeling life; rather, they should be penetrated by the intellect, mitigated by the understanding before affecting the human being internally.

“For the activity of the astral body is at its most vital where ... the process of the middle organization takes place: between digestion, blood formation and respiration. Due to the weakness of the I, this middle organization process is left to its own resources. It begins to develop all manner of self-willed processes, not out of the whole human being but out of the middle realm. And one may say that the disposition towards diabetes is present precisely when the I excludes itself from the inner processes” (37).

In summary, we arrive at the following picture of metabolic syndrome as an illness closely associated with type 2b diabetes mellitus (old classification): I-organization and astral organization fail to achieve adequate efficacy in the metabolic-movement system. The astral dynamic in this area of the threefold organism turns increasingly towards the middle realm of the human being and may be observed in such phenomena as an excitable emotional life. Being active peripherally, the I organization does not make its presence felt sufficiently in the metabolic-limb system and is unable to exert adequate control over this astral quality.

In this connection there is yet another viewpoint from which to look at the symptom complex now known as metabolic syndrome. It is the discussion offered by Rudolf Steiner in the middle chapters of his book *Fundamentals of Therapy*, which touches, as early as 1925, on the symptomatology of metabolic syndrome. In chapter 8 the higher-body constellation of diabetes mellitus is described. After a section devoted to the connection of the I-organization with sugar, we read the following formulation: “Everything that pulls the I-organization out of effective engagement in bodily activity promotes diabetes: upheavals occurring not singly but in repetition; intellectual overtaxing; hereditary conditions that hinder normal engagement of the I-organization in the organism as a whole...” (38).

It is a telling fact that will-activity in the limb system is capable not only of lowering insulin resistance but also of preventing later occurrence of diabetes. Activation of the opposite pole of soul life from consciousness has a positive impact on pathogenesis and thus points to the link described by Rudolf Steiner.

In chapter 9 the role of protein is examined and albuminuria is mentioned as a disease symptom. It too appears in connection with the action of the I-organization in the metabolic system (pancreas).

Chapter 10 comes to the role of fat in relation to warmth processes and the I-organization.

Chapter 11, finally, examines the role of uric acid, which also accompanies metabolic syndrome in the form of hyperuricemia. Thus in four chapters of the fundamental book on anthroposophical medicine, alongside of a discussion of diabetes mellitus, mention is made of associated symptomatologies which today are regarded as elements of metabolic syndrome. This interconnectedness was already recognized in 1925 in a spiritual-scientific exploration of the action of the I-organization.

Sensory Function in the Metabolic System

The characteristics of muscular insulin resistance are consistent with the withdrawal of the astral body and I-organization from the limb system. A complementary picture is found in hepatic insulin resistance and the deficient inhibition of gluconeogensis/glycogenolysis associated with it. When glucose is introduced through food intake or released when the digestive tract breaks down food to overcome its foreign qualities, in healthy individuals there is a decrease in hepatic glucose release in response to insulin as well as in response to the elevated glucose concentration itself. In an oral glucose tolerance test, a reduction of glucose production to approximately one half of the initial value is observed. The reduction reaches its maximum after 90 – 120 minutes and affects equally gluconeogenesis and glycolysis (39). The organism reacts with a sensory perception on a level far below the threshold of waking consciousness, and with the metabolic readjustment described it “makes room” for the glucose to be assimilated. In diabetes this perceptual capacity dwindles. At this point the I-organization is not only inadequately effective in the limb region, but one of the sensory processes maintained by it in the metabolic system has also become “blind.”

5. Diabetes mellitus – Pathological Manifestations in the Threefold Organism

5.1 Metabolic and Movement Organization

In advanced diabetes the pathological manifestations bear the same signature, but now they have shifted from the functional to the organic plane. Peripheral arterial occlusive disease, which develops at this stage of diabetes, affects the limb system by restricting the capacity for movement. Further aggravation of this condition can result from the various diabetic neuropathies. In addition there are the skeletal alterations,

the limited joint mobility, and of course the comprehensive picture of the diabetic foot. In place of a movement organization, what develops are phenomena of sclerosis_a visible sign of deficient efficacy of the will.

Diabetic Foot Syndrome

A characteristic result of diabetes in the limb system is the diabetic foot syndrome. In the current view, its etiopathogenesis entails neuropathic or ischemic factors, or a combination of the two, making it a pathological entity of blood and nerve.

The reductions of sensory functioning that may accompany the diabetic foot point to dwindling efficacy of the *I-organization.* Similarly, the reduction of pain perception and sensitivity, as aspects of awareness, points to the progressive withdrawal of the *astral organization.* Accordingly, part of the syndrome of diabetic foot is believed to be a muscular dysfunction characterized by an imbalance in the muscular equilibrium between agonists and antagonists in the lower leg and foot, followed by muscular atrophy. It is a physical image of the atrophy of the astrally-controlled movement organization. Commonly observed and consistent with this image are loss of elasticity and increased stiffness of the joints of the hands and feet, a cheiroarthropathy which affects more than 40% of patients with a long history of diabetes.

The neurotrophic lesions, the poor healing of rhagades or fissures resulting from skin dryness due to decreased perspiration, as well as the susceptibility to infections all point to a weakened *etheric organization*.

On the *physical* level, callus formation and in some cases thickening of the nail plate are examples of sclerotic phenomena. Foot statics succumb to gravity (with possible collapse of the entire arch, Charcot deformity), resulting in pressure sores with subsequent corns, under which ulcers finally form.

The osteoarthropathy characteristic of diabetes mellitus has various causes: In addition to mechanical factors causing the foot to succumb to gravity, a role is also played by nutritional aspects related to restricted circulation and by neuropathic factors associated with the dysbalance described above in the movement organization of the foot. Infections, as inflammatory processes, further aggravate the complex process. If the disease progresses, the resulting flat-footedness can ultimately develop into a "rocker foot" (40) with the middle of the sole bearing the maximal weight. At this point the three-foldness of the human gait has been lost, yielding to the forces of gravity. Tactile sense perception in walking is associated with the front part of the foot; here the nerve-sense system has created an organ of its function. Thus children frequently go on tiptoe when they are learning to walk, as their bodily form is largely determined by the nerve-sense system. The heel, in contrast, bears the will quality inherent in setting down the foot. These two areas are mediated by the arch of the foot, which, at advanced stages of diabetic foot syndrome, collapses: In the form-language of the altered foot skeleton, this reveals an unimpeded action of the forces of gravity.

Diabetes and the Metabolic Organization

The withdrawal of limb activity in diabetes is linked with corresponding restrictions in the metabolic area as well. Much like the insulin resistance of the skeletal muscles, there is a hepatic insulin resistance that shows a clear correspondence to the fasting blood sugar level. An incipient sclerosis of the liver_cirrhosis_is frequently associated with the diabetic metabolism. In this connection the term "hepatogenic diabetes" was coined quite early on, and an insulin resistance was doubtless also later described. Action of the higher bodies in the metabolic system is inadequate.

Action of the sentient organization is expressed in the intestinal movement system. The fact that it is dependent on waking and sleeping and that muscular contraction (e.g. in the gall bladder) is triggered by the dimly-sensed food stimulus is clear evidence of astral activity. A phenomenon associated with steatosis hepatis (fatty liver) is reduced gall bladder contractility, an expression of inadequate action of the higher bodies in the movement organization. In diabetes too, corroborating the picture developed here, one finds diminished contraction of the gall bladder after stimulation. This contraction and emptying disorder is considered characteristic of the diabetic gall bladder. Steatosis hepatis is a fairly regular finding, distinguished sonographically as "white" liver. It develops in the context of the higher body constellation described above, in which there is inadequate action of the higher bodies in the metabolic organization. As Rudolf Steiner put it in a lecture to the workers at the Goetheanum, "...if ... the astral body always remained outside as it does in sleep, then our organs would very soon become fatty" (41). In response to this unphysiological activity of the higher bodies there is an inflammatory reaction. The acronym NASH (nonalcoholic steatohepatitis) describes this quality, which arises in the form of chronic inflammation and then, under excessive forming by the nerve-sense system, leads to a disease process in the form of sclerosis (fibrosis). Numerous alterations of a similar quality in the gastrointestinal movement organization have been described. Interestingly, the symptom picture of bloating, nausea, heartburn and constipation or diarrhea, in comparison with a control group, was found more frequently in type 2 diabetes than in type1 diabetes (earlier nomenclature). In the esophagus, a decrease in contraction amplitude, increased (tertiary) contractions, multi-peaked peristaltic contractions and decreased pressure in the lower esophageal sphincter are found. Scintigraphic assessment reveals a delay in esophageal transit time in 40% – 80% of diabetics. Gastric motility disorders frequently entail

antral hypomotility and periods of frequent tonic-phasic contractions of the pylorus. In contrast to the air-filled fundus cupola, which remains unmoving in peristalsis and bears a relationship to the nerve-sense system, the antrum with motility "mill" represents the movement system of the stomach: Its rhythmical action is that of a rhythmic system mediating between polarities (fig. 2). When the sentient organization withdraws from this movement system, it leaves behind antral hypomotility and awakens in such complaints as nausea and postprandial bloating. As the intensity of movement recedes, "consciousness" arises at the wrong place. Independent of any diabetic alterations, simply an elevated blood sugar level is believed to delay gastric emptying. A comparable higher-body constellation is found in the small intestine. Here one observes hypomotility with reduced phasic contraction and nonpropagated, long-duration groups of contractions. In regard to the colon no significant diabetes-specific alterations have been described.

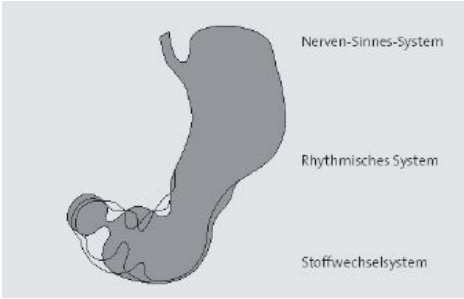


Fig. 2: *The Threefold Stomach: understanding antral hypomotility—Nerve-Sense System, Rhythmic System, and Metabolic System*

5.2 Rhythmic System

In the middle realm of the human being and rhythmic system, sclerotic phenomena are found as well. It has long been known that diabetics develop arteriosclerotic vascular alterations earlier and more frequently than non-diabetics. Even at the time of diagnosis a high percentage of diabetics show vascular alterations. As was mentioned above, in diabetes the sclerosis of the vascular system is localized at the extremities, i.e. peripherally. It affects chiefly the lower limbs and, in contrast to non-diabetic arteriosclerosis, it is distributed not segmentally but diffusely over the peripheral vascular segments of the limbs, coronaries and cerebral arteries. The histological picture includes the formation of intima plaques, in certain circumstances diffuse intimal fibrosis and the Mönckeberg's medial sclerosis typical of diabetes. The blood displays a corresponding quality of functional sclerosis: the phenomena of hypercoagulability. Elevated fibrinogen levels are observed, and along with them increased blood viscosity. Diabetics are also said to have higher concentrations of factor 5/8 and reduced levels of proteins C and S in comparison to non-diabetics. Fibrinolytic activity is decreased due to high levels of plasminogen activator inhibitor. In addition, elevated thrombocyte aggregability and increased platelet adhesion have been described. Possibly connected with this is the higher number of large and activated thrombocyte forms found in diabetics.

Also in regard to the endothelial dysfunction favored by diabetes, we note a shift in the interplay between forming/hardening and dissolving/dynamic processes, still almost on the functional plane, to reflect a dominance of the nerve-sense system. Here primarily constrictive qualities (endothelin, angiotensin II, noradrenaline) are encountered alongside of reduced dilative qualities (esp. NO). The spiritual-scientific significance of nitrogen has been discussed at another place (42). The collective action of antimonizing and albuminizing forces described by Rudolf Steiner has shifted in favor of the antimonizing principle. From the macroscopically describable plaques and procoagulatory state to the endothelial dysfunction, we encounter gradations of the same sclerosing principle. These phenomena exemplify perfectly how the human power of "judgment through intuitive perception"1 (http://www.anthromed.org/Article.aspx?artpk=70#footnote1) is capable of recognizing what is acting spiritually in the phenomena described by science.

Another indicator of the impairment of the rhythmic organization as mediator between the polarities of the nerve-sense system and the metabolic-limb system is the limitation of pulsatile insulin secretion. Thus, healthy individuals receiving intermittent doses of glucose show insulin oscillations of larger amplitude than patients with type 2 diabetes. Here, the capacity for rhythmic oscillation appears to become restricted (43).

This background casts a particular light on insulin therapy, whose implementation can only be crude and rigid when compared with natural insulin oscillations. For all that is positive and necessary about regulation of the glucose metabolism in the diabetic, its manner of application introduces a therapeutic principle that is rigid and incapable of rhythmic oscillation.

In the heart too a sclerotic illness is described which may be distinct from macroangiopathy and is in some cases designated as diabetic

cardiomyopathy. A disorder of diastolic relaxation and compliance is found, and frequently also an aggravated left-ventricular hypertrophy connected with the associated hypertension. The rate rigidity of the rhythmic system of the heart is significant as a phenomenon of sclerosis in the middle organization. At elevated heart rates, the respiratory sinus arrhythmia is limited or eliminated. This phenomenon is characteristic of a number of other sclerotic diseases of the blood vascular system such as coronary heart disease and hypertension, and is associated with a clustered incidence of sudden heart death. Essentially, one may say that the middle organization becomes excessively informed by the sclerotic qualities of the nerve-sense system.

Precisely with type 2 diabetes, arterial hypertension is an essential factor for prognosis and once again points towards the sclerotic and hardening quality. At the same time, arterial hypertension manifests a polar picture. The slender hypertensive contrasts with the adipose patient in terms of the polarity of the neurasthenic and hysterical constitutions. Formerly these two disease pictures were contrasted as "pale" and "red" hypertension. The neurasthenic form of the disease is characterized by the excessively forming action of the astral body that is characteristic of the upper pole, while the "hysterical" form is dominated by the type of astral dynamic found in metabolic syndrome.

5.3 Nerve-Sense System

The Eye and Diabetes – The Kidney and Diabetes

In the sensory sphere of the upper pole, the sense of sight is primarily affected. This includes all three areas of the eye organ's threefold structure: In the anterior section we find the cataract associated with diabetes. The iris may be affected by neovascularization (rubeosis iridis), ultimately leading to neovascular glaucoma. Finally, there is the critical phenomenon of diabetic retinopathy.

A glance at the sensory organization will provide an essential picture of its background. In contrast to the spherically encased central nervous system, the bony cavity of the orbita opens outward in an encompassing gesture. If it can be said that the skull cap envelops the nervous organization, then the orbita embraces a paired sensory organ whose twelve ocular muscles make obvious its connection to the movement organization. The sense organs are sites of a perceiving will-activity which—here—meets itself in the experience of sight. Will-quality in the sense organization and thought-quality in the nervous system are juxtaposed here. Compared with the sleeping will of the limbs, in the upper pole will-activity is closer to consciousness. When the will organization withdraws—ocular muscle paresis is more common among diabetics than among non-diabetics—sensory perception wanes and sclerotic processes develop in an organ which, in its essential nature, is close to an inflammatory process (44).

Diabetic Nephropathy

The kidney organization is mentioned at this point for two reasons: On the one hand numerous phenomena, such as its symmetrical formative principle, manifest its connection to the upper organization; and on the other hand, in diabetes the kidneys and eyes are frequently involved at the same time. Involvement of the kidneys in diabetes is associated with various disease processes. Among a number of other manifestations of renal disease, the glomerular area of the kidney is particularly affected. In terms of threefold organization, this bears a metamorphic relationship to the nerve-sense system. Rudolf Steiner points towards a connection between the kidneys and the eye organization. During sleep, structuring processes flow out of the eye organization and the entire head into the organism. "Let us take the example of the eye. In it we have not only the organization that mediates vision, but at the same time we have in the eye an image of the cosmos, an image of the spiritual forces of the cosmos. In the period between death and birth, the human being has lived in the soul-spiritual cosmos. The eye organization is modeled on this life in the soul-spiritual cosmos. The eye, like all organs of the head, has a dual function: The first is to mediate a correspondence with the external world through vision, and this takes place during our waking life. During our sleep life the eye, along with its environment—its nerve and blood environment particularly—acts back on the physical organism, specifically the metabolic-limb organism. For example, during sleep the forces of the closed eye act on the human kidney system and imprint it with the cosmic image. Other organs of the head imprint other aspects of the cosmos into the metabolic-limb system. Thus from the point view of the physical body we have our period of sleep primarily so that the head forces can exert their structuring action on the metabolic-limb organization" (45).

Diabetic nephropathy occurs in both type 1 and type 2 diabetes.

In the early phase of diabetic nephropathy there is increased blood flow and—with increased intraglomerular pressure—considerable increase in glomerular filtration. In patients with type 2 diabetes there is said to be an initial hyperfiltration that is less manifest. At this stage the organ is frequently enlarged. As the disease progresses we observe the development of glomerulosclerosis: The astral organization, with its

characteristic dependency on waking and sleep, changes the way it acts in the excretory and filtration processes, reaching a "head-like" constellation typical of the upper pole and associated with sclerosis. In the context of nephropathy it is possible for arterial hypertension to develop, revealing a further peculiarity of the two polar forms of diabetes: Type 1 diabetes gives rise to a hypertensive disorder only late in its course, in part due to an excessively formative quality of the upper pole, while type 2 diabetes, with its long history, develops hypertension quite early as a result of an astral dynamic belonging to the lower pole.

early as a result of an astral dynamic belonging to the lower pole.

Autonomic Neuropathy

From among the manifestations of the disease in the nervous system we shall focus on autonomic neuropathy.

The sympathetic nervous system is associated with a predominantly catabolic dynamic which is oriented towards awakening, i.e. towards the upper pole. Analogous to the threefold human organism, an activation of the sympathetic nervous system is associated with a threefold phenomenology: In the gastrointestinal tract we see sphincter contraction and reduced secretion; in the middle region, bronchodilatation with tachycardia; and in upper pole, mydriasis and awakening of consciousness. It is a picture of the astral organization progressively withdrawing from the metabolic system and pushing towards the upper pole.

The parasympathetic quality, in contrast, is dominant in sleep. In the upper pole it is associated with miosis, in the middle region with bronchoconstriction and bradycardic heart rate, and in the gastrointestinal tract with the generation of gastrointestinal motility and secretion. In the first case, the inner being shifts its orientation from the metabolic system to the awakening of consciousness. In the second, the upper pole of the human being falls asleep. Now the orientation is towards the metabolic system with increased gastrointestinal glandular secretion and motility. Rhythmic phenomena accompany the interplay of these two orientations of the inner being. We encounter this breathing rhythm once again in the respiratory sinus arrhythmia. With each in-breath the higher bodies adopt their orientation towards consciousness, accompanied by sympathicotonic dominance. With each out-breath a parasympathicotonic dominance arises with the nocturnal metabolic orientation of the inner being. In the entire span of the day, this breathing rhythm recurs in the alternation of waking consciousness and sleep.

In the context of diabetic autonomic neuropathy, what we find is restricted intestinal motility (see above), which points towards a deficient parasympathetic quality.

In the rhythmic system we observe restriction of the respiratory sinus arrhythmia, which—in the context of the cardiac autonomic neuropathy—is followed or accompanied by tachycardic heart rate. There are indications that the parasympathetic fibers are first affected by the neuropathy (46). Thus here too, the higher-body orientation associated with the parasympathetic nervous system withdraws far from consciousness into the night realm, while there is a relative dominance of the sympathetic quality which tends towards an awakening of consciousness.

Diabetic Polyneuropathy

Patients with diabetic polyneuropathy frequently complain of paresthesia and pain in the feet. Alongside of these "positive" symptoms indicative of an awakening of consciousness qualities in the "wrong place," there are also the negative symptoms—sometimes more frequent—of reduced sensitivity and reduced perception of pain and warmth. The astral body, normally active in movement of the limb system, withdraws from its physiological activity in this will-organization and may awaken in pathological awareness qualities. Deficient activity on its part can ultimately lead to the flaccid paresis of diabetic polyneuropathy. Here, pain and paralysis manifest their special connection (47). It becomes evident that the primary phenomenon is the inadequate astral action, while its manifestation in the peripheral nervous system is a "consequence." Thus when all the phenomena described above are taken together one arrives at a picture of diabetes in which the higher bodies withdraw from the metabolic-limb system and orient themselves towards the upper, consciousness-bearing pole of the human organization. The balance in the soul's breathing rhythm of waking and sleep is shifted towards the consciousness pole.

6. The Sclerosis Process in Type 1 and Type 2 Diabetes

Diabetes mellitus type 1 and type 2 both develop a sclerosis that affects the entire threefold organism, but the two have differing etiologies: In type 1 diabetes it is the dominance of the upper pole. The picture in the adipose type 2 diabetic must be distinguished from this: Here we find inadequate will-activity of the I-organization in the movement organization. Movement is coupled with an essentially related quality: that of inflammation.

Sclerosis and Inflammation

The course of an inflammation entails phases of heat generation, increased blood flow (vascular phase), secretion (exudation), cellular movement (migration) and catabolic metabolism occurring in an acidic milieu. The metabolism of movement displays similar characteristics in its generation of warmth, increased blood flood, dominance of movement phenomena and catabolic metabolism—again in an acidic milieu.

Systemically there is a comparable picture. The stress leukocytosis and the temperature increase have long been known, as has the fact that movement entails an acute-phase reaction comparable to that of inflammation. From this point of view all movement leads to a warming process in the organism akin to inflammation, while in return all inflammation in the human metabolic system entails movement phenomena (e.g. migration of inflammatory cells). Due to the inefficacy of the I-organization in the movement and metabolic system in diabetes mellitus type 2, we observe a waning of the inflammation-related quality, resulting in a favorable environment for development of the hardening disease

entity, sclerosis.

Thus one can contemplate characteristic manifestations of the sclerotic process in terms of the threefold human organism. In the upper pole with its dominance of the nerve-sense system, cerebro-vascular insufficiency is observed, with its possible consequence of cerebral insult. In the middle region the manifestation is coronary heart disease, while in the lower man it is peripheral arterial occlusive disease. The decisive element in sclerotic pathology of the upper pole appears to be the hyper-formative action of the nervous system, while in the limb organization the inefficacy of warming will-activity appears more significant (Fig. 3). On the soul plane, an excessively structured mental life that is insufficiently warmed by will activity in the thinking may be associated with cerebral vascular sclerosis, while in the limbs the tendency to vascular sclerosis is favored by inadequate engagement of the will. Coronary heart disease may be associated with an excessively structured and in some cases congested emotional life as well as with a restless, excessively aroused and wakeful soul life.

Regarding the various risk factor constellations, this differentiated picture based on the threefold organization casts a significant light on what might otherwise appear to be a uniform disease picture of arteriosclerosis. Thus, a large meta-analysis of 420,000 patients conclusively demonstrated the relationship between the height of the diastolic blood pressure and the frequency of stroke (48). Isolated systolic hypertension also represents a risk factor. This sclerosing vascular disease appears to contrast with arteriosclerosis of the limb system. According to Salonen et al. (49), the severity and extent of autoptically determined arteriosclerotic lesions is very similar in the coronary arteries and the extracranial vascular system, while correlation with the arterial periphery is weak. Like elevated LDL cholesterol levels, arterial (systolic) hypertension, though a highly significant risk factor in cerebrovascular disease, appears to play "a rather minor role" (see above) in peripheral arterial occlusive disease. On the other hand, diabetes mellitus as a disease of the will organization plays a critical role in its clinical manifestation. It leads to macroangiopathy of the limbs, which manifests strikingly in the peripheral sections of the leg arteries (50).

Mönckeberg's Arteriosclerosis

As a contrasting phenomenon, atherosclerosis affects primarily the intima of the arteries. This is the area of the vascular wall in direct proximity to the blood, the site of metabolic processes which make possible the awakening of a (largely unconscious) tactile sense and perception of the shear forces of the vascular wall. Mönckeberg's arteriosclerosis, on the other hand, affects the muscular organization of the media which borders on the adventitia, whose encapsulation of the artery suggests comparison with the skull capsule. Mediating between the vascular realm (akin to the blood and sensitive to its movement quality) and the adventitia (tending towards structure-forming and composed of connective tissue) is the media. This disease, first described in 1903 by Mönckeberg, is characterized by focal to confluent calcifications of the extracellular matrix of the media. The muscle cells decrease in number and some of them calcify. In the further course of the disease, formation of typical bone trabeculae is observed, in the sense of ectopic ossification. In contrast to atherosclerosis, lipid deposition and macrophages are absent (51). A disease frequently associated with diabetic polyneuropathy, it offers an archetypal example of the essential character of pathological processes as described by Rudolf Steiner: A process that is physiologic in the human organism (in this case bone formation) becomes pathological when it occurs at the wrong place. Osseous encapsulation, a physiological process for the head organization, appears as a "second skeleton" in the vascular realm. In this disease process the ideal, balanced metamorphosis between muscle and bone (Rudolf Steiner, see above) shifts towards bone formation. Contrastingly, in intimal atherosclerosis the sclerosis is not directly caused by the bone forming process, but by the chronic inflammation. Thus in the case of atherosclerosis of the intima—a vascular area closely connected to the metabolic system—the shifting of the balance towards the nerve-sense system is answered with chronic inflammation—i.e. a reaction form of the metabolic-limb system—which ultimately leads to sclerosis. In Mönckeberg's sclerosis, on the other hand, a hardening quality belonging to the nerve-sense system—the upper pole of the organization—directly causes the medial sclerosis in the form of ectopic ossification.

Abb. 3: *Manifestations of the sclerotic process in the threefold organism.*

Upper Pole – Hardening and Excessive Structuring
Nerve-Sense – e.g. cholesterol, hypertension
Organization – cerebro-vascular insufficiency

Organization – cerebro-vascular insufficiency
Thinking

Middle Sphere
Rhythmic Organization – Coronary Heart Disease
Feeling

Lower Pole – Peripheral arterial occlusive Metabolic-Movement – disease
Organization – Reduced will efficacy
Willing – e.g. diabetes mellitus

The anthroposophical perspective reveals significant meaning in the sclerotic pathology associated with diabetes: In this condition the individual is engaged in a struggle with hardening, ahrimanic qualities; and the effect of the disease is to prevent these from gaining greater power over the human being. Disease, here, appears to be sent by good powers (52). From this point of view, the rising number of diabetic patients casts light on the dominant mentality of a civilization that appears to be in need of this and other diseases as remedies.

7. The Daily Incarnation/Excarnation Rhythm

An archetypal manifestation of the fluctuating connection of the higher bodies to the living organism can be observed in the daily phases of waking and sleep. A polarity is evident between the morning and evening constellations. Normally morning is associated with the qualities of refreshment, renewed vigor and the impulse to be active. This is one side of it—a very significant side, which points towards the awakening of the soul out of sleep consciousness. "In sleep the astral body returns to its home, and upon awakening brings reinvigorated forces to life. The outward expression of what the astral body brings with it upon awakening is the refreshment offered by a healthy night's sleep" (53).

There is, however, another morning quality described by Rudolf Steiner: sclerosis. Thus, the morning hours are also characterized by the maximum heart attack frequency in coronary patients, and the morning stiffness of rheumatics. Impaired engagement of the astral body may also cause a range of symptoms from morning exhaustion to the paralyzing morning "low" of the depressive patient. Similarly, even before waking the vascular system is subject to excessive forming action with heightened blood pressure. As further indicators of this hardening quality, fibrinogen and plasminogen activator inhibitor levels rise (54) and reduced erythrocyte deformability is noted alongside of elevated hematocrit. In short, the procoagulatory, solidifying qualities predominate in the morning hours in the phase of incipient awakening. This sclerotic phase is associated with the minimum core body temperature in man. The process of morning awakening may be compared to the arsenic process in nature: "What takes place within the human being may even be called by the name of an external process that bears what one might call an 'elective affinity' to the human process. For example, if one wishes to express this affinity of the astral body for the etheric body—and thus also for the physical body—one may quite rightly speak of it as "arsenization." In the human being a subtle arsenizing process is continuously taking place, and it is particularly strong at the moment of awakening" (55). Slightly later in the same lecture, Rudolf Steiner offers a macrocosmic image for the arsenic process: that of the "earth becoming rock-like." On a number of occasions Rudolf Steiner mentions the other aspect of sleep: its mineralizing, sometimes pathogenic quality. Applied to the sclerotic tendency, this suggests a positive meaning for sleeplessness as a preventative of sclerotic disease. On this background, medicinal induction of sleep also assumes a problematic aspect.

The critical factor for this other effect of sleep is the duration of the separation of the astral body and I from the etheric-physical organism. If it lasts too long, the organism grows distant from its archetypal human form, developing extra-human processes of plant life and mineral sclerosing. The "persisting capacity"—the capacity to maintain the signature of the higher bodies in oneself—is the precondition for refreshing sleep and timely awakening. Sleeping too long—beyond "persisting capacity"—leads to the processes of sclerosis. In many instances the feelings of malaise that follow prolonged sleep can be interpreted in this way from a spiritual-scientific point of view.

In the evening, the polar picture to this morning sclerotic tendency is observed. In late afternoon the core temperature reaches its maximum: generation of warmth as opposed to the cool morning constellation. The procoagulatory quality of morning, with its increased cardiovascular risk, dwindles as the day progresses towards evening (e.g. decreasing plasminogen activator inhibitor levels). Thus the sclerotic morning tendency appears to be balanced against an evening quality more akin to inflammation in its generation of warmth. Thus in the course of each day a human being runs through the essential disease spectrum of his earthly existence. On the soul-spiritual plane, the thought forces are dominant in the morning, while later in the day the inflammatory constellation is accompanied by an unfolding of will forces. "The person who

has been through esoteric development will soon discover that such an affinity does exist between his own etheric body and that which occurs in the external ether, and that he stands in a different relationship, so to speak, to the spirits of the morning than to the spirits of the noontime and those of the evening. The spirits of the morning stimulate us in such a way that in our etheric body we feel more stimulated to an activity tending towards the intellect, towards the reason—more able to think over what has been experienced, more able to process with the judgment what has been observed in memory. As midday draws on, these forces of judgment gradually flag and the human being feels the impulses of the

what has been observed in memory. As midday draws on, these forces of judgment gradually flag and the human being feels the impulses of the will at work within him. Even if towards noon the ability to perform, the energy for outer work, begins to grow less than in the morning, inwardly the will forces are more active. And as evening approaches, this is when the productive forces enter in—those more connected with imagination" (56). In this sense the adipose type 2 diabetes, with its inadequate engagement of the will in the metabolic-limb system, can be seen as an "impaired" evening constellation. Type 1 diabetes resembles an exaggerated morning constellation that persists on awakening and leaves the metabolic-limb system inadequately engaged.

Interestingly, when the "warmth" of the evening is contrasted with the "cooler" morning constellation, a number of phenomena change—if only in their outward exposition. Thus, in warm environments reduced blood sugar levels are more frequent in type 1 diabetics; indeed, insulin requirements generally show pronounced temperature-sensitivity. Temperature dependency has also been described for other sclerotic diseases; hyperthermia, for example, can produce prolonged reductions in blood pressure.

Diabetes 2b (old classification) is characterized by inadequate efficacy of the higher members in the metabolic-limb system, a signature that corresponds to an "impaired" evening constellation. From this point of view, the course of human life reflects the polarity of diabetic pathology in its chronological manifestation of juvenile and senile diabetes. At the same time the course of the day presents a miniature image of this polarity in the pathological tendencies of the exaggerated morning constellation and the "impaired," deficient evening constellation.

This characterization illuminates the spectrum of diabetic pathology in the context of the incarnation and excarnation process, in which the human being enters earthly life at birth and returns to the spiritual world at death. Before the insulin era, type 1 diabetes regularly resulted in early death; left untreated, it hinders incarnation. The I-organization is unable to develop adequate engagement in the metabolic organism. Type 2 diabetes shows the opposite picture: premature withdrawal from the limb and metabolic organization leading to hardening and sclerosis—characteristic qualities of the upper pole. Thus sclerosis offers a particularly striking example of "head development" at an inappropriate place. To put this connection into a broader context, it is helpful to contemplate an image which can be developed in connection with cancer and has been presented by such researchers as B. von Laue. The tendency to misplaced sense organ formation—the essential picture of cancer—is a premature manifestation of an archetypal formative gesture described by Rudolf Steiner: a physiological metamorphosis of the metabolic organization of one earth life into the head organization of the following life. A related thought sees the diabetic's withdrawing limb organization, with its traits of the upper pole in the sense of unphysiological head-formation, also as a premature manifestation of this great transformation that links one earth life to the next. Thus each disease, in its spiritual significance, bears a relation to the threshold of the spiritual world and poses an unmistakable inner task—one which either is lived out in the destiny of the disease itself or can be taken up by the patient consciously on the soul-spiritual level. Out of the sclerotic disease of diabetes an opportunity arises for the developing human being. Every therapeutic measure must be examined against this background: Will it help or hinder the patient's inner being on its next steps of development?

8. Therapeutic Considerations

Diet

Normally, dietetic approaches to diabetes treatment take calorie intake into consideration, but further "restrictions" such as flexible insulin management in the framework of an ICT (intensified conventional insulin therapy) are considered "a thing of the past." Quite apart from the points to be presented below, it is interesting to note that a dietary approach long known to nephrology has been gaining importance in diabetes treatment:

Protein restriction has long been practiced in the nutrition of renal insufficiency patients. In his book *Fundamentals of Therapy,* Rudolf Steiner develops a particular view of albuminuria. The condition stems from deficient breakdown of food protein by the pancreatic organization, leaving untransformed foreign protein which then undergoes excretion by the astral organization through the kidneys. Dietary restriction of protein can evidently result in reduced excretion of foreign protein. A relevant study was conducted in the framework of the "Prosit-Projekt"2 (http://www.anthromed.org/Article.aspx?artpk=70#footnote2), a program for diabetes patients entailing smoking cessation, optimized glucose and blood pressure regulation and protein restriction (60 – 80g/day). After a mean period of 14 months, one third of the patients showed an improved risk profile with normalization of microalbuminuria (57). In this way the metabolic efficacy of the I-organization, restricted in connection with the pancreatic function in diabetes, receives due consideration and dietary activation. The vegetable diet, being less closely related to the human being than animal substance, demands increased metabolic activity.

An astral organization which presses out of the metabolic limb system into the upper pole of the human organization is connected with a sympathicotonic functional state. In this context a vegetable diet will have the effect of calming and drawing back the over-powerful astral organization. In addition, by favoring those parts of the plant which are related to the metabolic-limb system (in terms of the threefold plant), one can strengthen the efficacy of the will in the body; foods taken from the blossom sphere of the plant are particularly important for this purpose (see Kühne, *Diabetes und Ernährung*, p. 54).

purpose (see Kahne, Diabetes and Ernährung, p. 54).

Medicinal Therapy

Each illness can be understood as a task challenging the developing human being and as a reflection of the individual's particular situation in regard to threshold to the spiritual world. In this sense a spiritual reality is expressed in it, and encountering it is quite comparable to encountering an inner task on the path of spiritual development. When we compare the spiritual reality of a disease in the way that Rudolf Steiner was able to describe for smallpox with the level of understanding of disease which our present-day consciousness is able to attain, it becomes obvious that the picture we have presented of diabetes—a disease affecting a great portion of humanity—can be no more than a preliminary sketch.

A great deal will depend on achieving a deeper understanding of the disease—and this must not be seen as an exclusively scientific issue. It must be born out of the will to heal. The more exactly the disease can be described, the more precisely it will be possible to formulate the question as to the requirements for healing. Out of the effort to understand, the physician develops insight into the therapeutic goal and forms a cognitive organ for the curative qualities that match the question posed by each illness. The therapeutic goal is to draw the I-organization from peripheral activity to central engagement in human organism, i.e. in the metabolic-limb system. We must set about a task posed by Rudolf Steiner: to study the therapeutic efficacy of peripherally applied etheric oils, such as rosemary therapy, which could gain a significance in diabetes treatment comparable to that of mistletoe in cancer.

Given the inadequate record of therapy documentation and the dearth of relevant studies to date, if we are now to present therapeutic approaches outside the scope of regulatory medication (e.g., insulin substitution), it will be necessary to make a preliminary methodological remark. Any therapy presupposes a complete understanding of the disease to be treated. If the understanding is restricted to the physical level, the therapeutic goal will consist in correcting a pathology that has been described in biochemical terms—e.g., insulin substitution. If, on the other hand, the understanding embraces the essential nature of the disease, the spiritual entity which ultimately leads to pathology of the sugar metabolism on the physical plane, then the scope of the task broadens: The therapeutic goals now formulated may point towards healing forces in the kingdoms of nature as a source of appropriate remedies. This must be followed by clinical verification. As an example, after describing the essential character of diabetes Rudolf Steiner pointed to the resulting therapeutic goal and finally to the oil-forming process. Based on the essential picture of diabetes, the attempt will be made to formulate resulting therapeutic aims and relate these to the remedies that have been found effective in practice. It need hardly be said that this represents only the initial concept for a project with much development ahead of it.

Rosemary

The problem in diabetes is that the I-organization is “peripherally” active and inadequately engaged in the metabolism. Hence the task is to draw it in. This is where the rosemary oil dispersion bath—based on an indication by Rudolf Steiner—gains significance.

The rosemary leaf presents two polar qualities. On the one hand there is the oil forming process, a sulfuric-phosphoric process extending into the central region of the plant organization. In the etheric oil, cosmic warmth forms an initial, comparatively delicate corporeality. In this case the process extends into the leaf **r**egion, which is dominant in these labiates. The form of the leaf, in contrast, speaks a different language. It is needle-like, pointed and narrow, revealing powerful forces of form and structure with a thrust towards hardening. As the rosemary bush ages, the hardening quality becomes evident in its woody stems. One has the impression that the leaf's life-forces are drawn completely into the oil forming process, so that they withdraw from their organic vegetative action in the leaf forming process. Hence the pointed, needle-like shape resulting from forces of form and hardening. Here we see a direct confrontation of sal and sulfur processes in the leaf region (58).

Through the sulfuric-phosphoric quality of its etheric oil, rosemary draws the peripherally active I-organization into will-ful engagement in the metabolic-limb system. In his notes to first medical course, Rudolf Steiner also speaks of the function of foot baths and compresses on the limbs in uniting the lower organization with the I and astral body (59). This is the background for rosemary therapy in polyneuropathy.

A variety of corroborating observations connected with the action of this ancient medicinal plant have since been described. A significant study in this connection describes the action of rosemary (and lavender) by the olfactory route—an application closely connected with the sensory organization. When applied in bath form and in contact with the skin's sensory sphere, it also provides for the olfactory perception essential to its therapeutic action (60). Rosemary increases wakefulness and reduces drowsiness. The study corroborated this, finding a reduction of frontal alpha power, an electrophysiological parameter of the nerve-sense organization.

In the feeling realm, a reduction of anxiety and emotional tension was observed: a positive change in psychological phenomena whose description precisely matches those occurring in diabetics.

Many phenomena, supported to various degrees by studies, point to increased efficacy of the will in the metabolic and limb organization with use of rosemary. A number of reports refer to relaxation of the bronchial and intestinal musculature (61). By its warming, will-natured action,

rosemary supports the higher members and relaxes muscular hardening caused by excessive engagement of the nerve-sense system. Its choleretic action points in the same direction. Used over extended periods it is found to have an ulcer protective action stemming from its support of mucoprotective factors, not from changes in acid secretion (62). Excessive action of the nerve-sense system in the gastric organization is harmonized by rosemary. In addition, a hair growth promoting effect described by Rudolf Steiner is supported by a study which employed rosemary as well as lavender, thymus vulgaris and cedrus atlantica (63).

In another study of patients with "peripheral circulation disorders," Rulffs (64) found that a four-week treatment with twice-weekly rosemary oil baths had a circulation-promoting action exceeding that of baths using only warm water. Here too, rosemary supports increased will-related engagement of the I-organization in its instrument, the blood.

Regarding glucose metabolism only a small number of observations are presently available. While an older study using animals documented a glucose raising effect of rosemary, a later study based on animal experiments described a glucose lowering effect (65).

In summary, rosemary therapy brings the higher bodies into a strengthened, will-filled and warming engagement of the kind required in the therapy of diabetes mellitus. As a curative plant, rosemary condenses the imponderable qualities of light and warmth in its oil-forming process and absorbs them into its organization. In the human organism its action is the same: I-organization and astral organization are strengthened in their organic activity and guided to take hold of the metabolism and the limbs.

Mistletoe

Rudolf Steiner introduced mistletoe into cancer therapy. In its essence this illness represents a "misplaced attempt at sense-organ formation" and thus it is characterized by a specific predominance of the nerve-sense system. Human sclerotic pathologies also show a predominance of the nerve-sense system, but instead of causing the sense-organ forming tendency manifested in cancer, it leads to "head formation" in the form of sclerotic processes. It is a predominance of the nervous system, in contrast to one of the sensory system, which characterizes sclerotic disease.

Rudolf Steiner saw it as an essential typological quality of mistletoe that its developmental phases are out of accord with the annual cycle, blossoming and fruiting at the "wrong time." This quality can also become significant in the therapy of sclerotic diseases, as the following image may help illustrate: First, let one imagine the situation in winter, with nature rigidifying in the cold. Over the surface of the earth—hardened and covered with geometrically formed snow crystals—the light of the sun may become glaring and blinding to the eye. This winter situation may be seen as nature's image for the nerve-sense system, whose organization too strives towards form and hardening, and is shone upon by the light of consciousness. In this winter situation, mistletoe forms its berries in a sulfuric process. At the "wrong time," this curative plant develops a warmth quality directly polar to the cold of the season.

From this nature-image a remedy picture follows: Mistletoe is able to generate a warmth quality in the sclerotic organism, thus stimulating the capacity for inflammation. It helps connect the processual, will-natured action of the higher members with the organism. Rudolf Steiner describes this action as a powerful "engagement" of the higher bodies, supported by phosphoric processes which are also inherent in mistletoe. It is the realization of a salutogenic principle that is polar to the higher-body constellation found in sclerotic diseases and diabetes in particular.

While viscum-therapy for cancer is generally given in the form of injections, its use in diabetes, as practiced for example in traditional African medicine (Nigeria), is by the oral route. In an animal study of the antidiabetic action of viscum album, Swanston-Flatt et al. (66) found no glucose lowering action but a positive effect on associated symptoms (hyperphagia, polydypsia, weight loss). Obatomi et al. (67) demonstrated a glucose lowering action for mistletoe grown on lemon and guava trees. The authors surmise an improvement in peripheral glucose utilization. Finally, Gray and Flatt (68) studied the effect of a mistletoe extract on a clonal insulin-secreting cell line and found a dose-dependent increase in insulin secretion.

Quartz

Diabetes is associated with a restriction of the sensory functions. The involvement of the eyes in diabetes is an instructive example. It provides a bridge to understanding other restrictions of sensory activity, such as those of the sense of touch in polyneuropathy or, in the metabolic organism, the "blindness" to subconscious mutual perception of the organs (see above). Thus these restrictions affect a range of sensory functioning from conscious perception in the nervous and sensory organization to the unconscious sensory perceptions of the metabolic organization. The therapeutic goal here is to provide support for the sensory function.

Starting in the embryo, the relationship of quartz to the sensory organization is apparent in the high silicon-content of the amniotic fluid which surrounds the ectoderm—the tissue from which the sensory organs derive. With its essential kinship to light, quartz has the capacity to exert a formative and differentiating action on the ectodermal structures which later develop sensory functions, from the tactile sensitivity of the skin to the neuroectodermal organs proper. As a remedy, quartz supports the activity of the senses. The areas of the human organism which develop a particular relationship to silica are peripheral structures determining form and structure. Besides its property of supporting the sensory function,

particular relationship to silica are peripheral structures determining form and structure. Besides its property of supporting the sensory function, silica serves the shaping power of the I-organization, making it possible for the human form to arise. For a 35-year-old diabetic patient, Rudolf Steiner and Ita Wegman recommended "silicic acid in the 10th decimal potency" along with rosemary therapy (69).

In this connection the substance polarity of silica and calcium is critical. When the organism is first taking form, silica accompanies the forces of structure and form; in advanced age, it is calcium that is dominant in the context of sclerosis.

Phosphorus

Inherent in the human sensory process is a second quality. As the rosemary polarity opposes formation and fire process, this dynamic phosphorus power stands in opposition to structuring quartz. The quartz qualities are found in the sensory process, taking in the light that is active in all sensory modalities. Opposed to them is the will-related I-activity of perception, which in the language of substance is related to phosphorus. Quartz and phosphorus are among the essential functions in the sensory process.

In contrast to the sal process, phosphorus bears imponderables in its dynamic action:

"The substances that stand in polar opposition to salt are those that internalize the imponderable—light in particular, but also other imponderables such as warmth and kindred ones... This is the basis for the curative efficacy of everything contained in phosphorus or related in any way to phosphorus as a healing process. For this reason phosphorus, an internalizer of imponderables, becomes most particularly suited to pushing the astral body and the I back in when they are disinclined to associate with the human being" (70).

Thus phosphorus is able to guide the will-related action of the I into the organism, in this way acting much like the etheric oils of rosemary. Considering also the impaired withdrawal of the higher members as they transition from a day-time to a night-time configuration, we see that the low potency morning dose of phosphorus can be complemented by a higher potency evening dose.

Other Remedies in the Treatment of Diabetes

Another remedy which takes on importance in the picture of diabetes we have sketched is iron. One of its essential qualities is an incarnating thrust that draws the higher members into the organization. In the form of ferrum sidereum, in the present context it can also be applied in combination with the pancreas organ preparation. The formative forces of the pancreas, which in type 1 diabetes is subject to progressive sclerosis, can be supported by its organ-building action. Many patients experience a beneficent action from the preparation pancreas/meteoric iron in this context. In some cases its indication is guided solely by indefinite sensations reported by the patient. Occasionally differentiated perceptions are also reported in connection with this medication, apparently related to subtle actions of the higher members.

A 33-year-old prospective nurse has suffered from diabetes mellitus type 1 since about the age of 2. Intensified conventional insulin therapy has long since been abandoned in favor of an insulin pump. She comes seeking complementary treatment options in anthroposophical medicine. Following is her description of her experience with the subcutaneous injections of pancreas/meteoric iron which she was prescribed:

"The condition prior to receiving the remedy is the feeling of an unwarmed space—a space not cold or dead, but deeply passive and cool. When the remedy is brought in a "swimming tube" develops and in spite of the solid physical boundaries wraps itself around and inside of the abdomen. A warming, active zone comes into being whose activity feels like glowing embers or fire. ... Little by little, this active zone makes it possible for me to begin to inhabit the formerly passive space."

Stibium too manifests a structuring activity. It supports the forming forces of the I-organization in their organic activity. Positive experiences with it have also been reported on the ophthamological arena (71).

Drawing will activity into the limb and metabolic organism in the way described is the therapeutic task for the adipose type 2 diabetic. Initially one often encounters an excited astral organization that penetrates into the middle realm. This can be calmed and drawn back to the lower pole using Bryophyllum, a plant with a vegetative dominance. This is nicely complemented by Conchae, which has the capacity to "drive out" excessive and inadequately controlled astral activity. In its shell formation, the oyster displays an analogy to the formation of the skull cap. In the oyster, however, the soul-spiritual that is freed cannot awaken to consciousness through a neural organization, but remains on a level of sleep. This quality of the oyster shell can have a soothing action on the restless astrality of the type 2 diabetic.

The motility disorders of the metabolic organization point to yet another therapeutic need: that of supporting the I-organization indwelling the intestinal sensory processes and the astral organization at work in movement processes. To begin with, the sensory function in the intestinal tract can be stimulated with caraway. In its substance polarity of resins and etheric oils, caraway contains both of the qualities that accompany the sensory process in the form of phosphorus and quartz (72). In combination with Carbo, it appears to offer a particularly beneficial medication for such conditions as diarrhea due to autonomic neuropathy.

for such conditions as diarrhea due to autonomic neuropathy.

Support for the movement organization in the gastrointestinal tract can be supplied by bitters (Gentiana lutea, Geum urbanum, both in low potency). Steatosis hepatis, commonly encountered sonographically as "white liver," points to the inadequate engagement of the higher members. As a supportive remedy, Taraxacum in low potency is effective here as part of a comprehensive liver therapy.

9. The Meaning of Diabetes for the Individual and as a Symptom of our Times

Each of the two forms of this disease points in a different way to man's connection to the spiritual world. In the context of the three-fold human organism, waking day-consciousness develops on the foundation of the nerve-sense organization. It is the quality of consciousness which develops on "this side" of the threshold to the spiritual world. It is transcended each time the human being falls asleep and waking consciousness is extinguished. Will activity, in contrast, has a continuous dwelling place in the "night realm" of sleep consciousness: the spiritual world. The threshold with its guardian quality, mediating between "this side" and the "beyond," has its seat in the rhythmic system.

Early development of the forces of intellect and memory can prematurely sever the growing child's close connection to its spiritual home and produce an earthly quality of consciousness_awake and focused on "this side." This may contribute towards a condition in which the upper members of the human organization fail to unite in a physiological way with the metabolic-limb organism, thus promoting later manifestation of diabetes. In the adipose type 2 diabetic, in contrast, restricted will activity causes inadequate engagement in those areas of the organization which remain continuously asleep during day-consciousness.

The pronounced thrust towards earthly consciousness, developing out of opposite circumstances, is associated with sclerotic phenomena. This poses the patient with a different inner task than that posed, for example, by inflammatory illnesses, whose consciousness gesture is that of falling asleep. In sclerosis, the task posed by the illness is that of confronting a hardening ahrimanic reality.

The task is to warm and enliven the thinking, as the diabetic tends too be too wakeful, too mind-oriented and often excessively formed and slender_the kind of patient who might come to the doctor's office carrying detailed documentation of his glucose profile. Diabetics need support and training for this enlivening of the mind, not an emphasis on abstract calculations which so easily become a hindrance. Given an excitable emotional life, poorly controlled and balanced by forces of thought, the patient's task is to become "the measure and master of the floods of feeling" (Christian Morgenstern). Finally, schooling the will becomes the inner task posed by the illness. The light of thinking can illuminate the domain of the will. To liberate thinking from its abstractness and enliven it becomes the particular inner task in the destiny of these patients.

With transformation of thinking and enhancement of will capacity as its aims, the entire life of the diabetic appears as a great school for the will. How much renunciation and self-overcoming goes into the mastering of daily existence! Particularly in the case of type 2 diabetes, where patients do not experience themselves as acutely ill, it is necessary to learn to act out of insight without the pressure of direct suffering. Thus the illness itself clearly points towards the path of inner schooling. The destiny inherent in this illness contains *motifs* also found in the tasks that an individual on a path of inner development must freely take on_those of the "six qualities" or the eightfold path, for example.

Of the six qualities, we have spoken of the need to achieve control of thought processes and will impulses; a further challenge is posed by the feelings. The documented peculiarities in the diabetic's emotional life, such as the heightened anxiety, unrest and underlying depressive condition in type 2 diabetes, pose long-term challenges in themselves. Yet the practice of positivity too, attending to that which can be genuinely recognized as positive—easily succumbs to the patient's sense of a dim prognosis. It is difficult, and requires focused attention, to orient oneself inwardly to the positive fruits of the illness, to the "light side" that casts the shadow of disease. It is a daily struggle to maintain a perspective of openness to the future, one which recognizes new possibilities in spite of, or perhaps because of, the disease. A woman patient with type 2 diabetes gave the author a reproduction of the charioteer, remarking that the figure's uprightness and control was a perfect representation of the inner goal and challenge of diabetes (Fig. 4).

Fig. 4: *The Charioteer. Delphi Museum.*

Medicinal therapy of diabetes—the Raphaelic approach—acts at a great remove from the patient's consciousness. When it is complemented by a Michaelic impulse, the patient is challenged to assume inner tasks as a developing individual. Here we see the real meaning of diabetic training. It should never be confined to the intellectual level of diabetes-specific information. "Calculating units of insulin in reference to a normal value, a correction factor and calorie requirements is precisely the kind of thing that has always come naturally to me," said one type 1 diabetic who had been admitted for intensified insulin therapy. She had a great longing to move from living in her thinking to living in the will. Thus the central focus of diabetic training, beyond providing necessary knowledge of the illness and training in glucose-regulating therapy, is to provide assistance with questions regarding the path of individual development as it applies to all three faculties of the soul: thinking, feeling and the will. In the souls of some diabetics these questions are intensely alive and appear as the central task posed by the disease; in others, they remain unconscious as an unformulated question and arise in the "school of life" in the day-to-day process of coping with the disease.

In the disease cases on which Rudolf Steiner was consulted, there is a case in which a diabetic patient is given a meditation created to draw will forces into the thinking. This provided an effective inner complement to the external therapy of hot rosemary baths.

At this point we shift our attention from questions of individual destiny to the significance of diabetes for our times. Our culture is characterized by an increasing abstraction and mechanization of thinking, and these qualities are now fostered at a tender age by early computer use.

Impotence of the mind leads to paralysis of the will, which is mirrored in an array of products of our civilization that replace limb activity with button pushing and provide for no compensating activity. In this sense our age creates a predisposition to such illnesses as diabetes, which are frequently seen in conjunction with our high standard of living. In confronting the challenge of this pathology, we begin to recognize a developmental necessity not just in the destiny of individuals but of our age itself. In this sense illness, recognized as a task or challenge, is a source of healing impulses for humanity as a whole. Beyond its meaning for the individual human being, diabetes can begin to be seen as a disease which has been taken on by human beings for the healing of humanity as a whole. As with other diseases, meaning appears threefold in its individual, its community, and its era-related aspects. Current therapeutic practice pursues the goal of regulating various indicative parameters to within normal values (glucose, blood pressure, lipids). This approach has produced documented improvements in prognosis.

In regard to the disease process itself, however, this therapeutic approach represents nothing more than arresting the disease at a particular stage or regressing it to an earlier degree of severity. It is not a disease-overcoming principle, but more a "mummification" of a disease manifestation which results in an improved prognoses. From the perspective of the insight that disease poses a task and has a meaning, the exclusively regulatory approach to therapy appears totally inadequate and illusory as a medical response.

The attempt to answer such questions has resulted in the development of germinal therapeutic concepts which merit a place alongside of the conventional approach. It has also greatly clarified the nature of the inner task posed by diabetes, offering the patient an opportunity to take steps in inner development.

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