

A BRIEF REVIEW OF ĀYURVEDA*

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ABSTRACT: There is much to be desired for the promotion of greater understanding and appreciation of *Āyurveda* in the Western world. This is an attempt on the part of a Western mind to present an objective study of the basic concepts of this basic Science with a view to dispel Western prejudice. The fact that *Āyurveda*, by virtue of its unique efficacy, has been recognised by the WHO should remove further misgivings if any.

This is an attempt to give a brief review of *Āyurveda*, the traditional Indian science of life. It springs from the efforts of a western mind to understand the basic concepts of this ancient science and therefore probably sees certain things a bit differently than they are seen from the viewpoint of an Indian *vaidya*. However, this effort is combined with a determination to throw off the western prejudice, too often found even among indologists – who sometimes do not want to believe what they read and then only take interest in ethnology and language. Too many in the past have mistaken *Āyurveda* for just a primitive approach in trying to understand disease and therefore resulting in a useless fantasy of the mind. This is most certainly not the case. Let me take one extreme example of how such speculations can totally go astray. In a thesis on *Āyurveda* by Kipnis, he refers to a western indological view (not shared by him) that *vāyu* – one of the three basic forces of life – would actually be the flatulence. Certainly, *vāyu* actually means “wind” and flatulence is also called “*mala vāyu*” or “bad wind” in Sanskrit. Therefore, somebody once believed to understand how the “primitive views” had observed the flatulence and somehow associated it with an important function in the body. [It may be remarked though, that flatulence can be a symptom of a disorder of the *vāyu* or *vāta doṣa*, see below – added in September 2005.] How poorly he must have read Caraka and Suśruta, the legendary Indian physicians – otherwise he would have known that this name is given the functional principle because it “moves like a wind” in the body. The best comment to give such interpretations is to quote the poet Hudibras, here freely translated into English:

“Like a wind pressed in the bowels becomes a fart
when blowing down, it causes, when it upwards
moves, great light and revelation.”

I think that we have to accept the fact, often uncomfortable to a western scientific mind, that Indian scientists and philosophers of way back pasts had their ways to arrive at valid knowledge without the need for complicated instruments. I think we will also have to accept the fact that there is more in the world than the mere material objects of our five senses, to which, however, our scientific instruments even more limit our perceptions, while at the same time revealing those objects in much more material detail. Discoveries in parapsychology hint on the existence

of other realities, too – even though unexplained, because the explanations are usually sought where they are not: in a science which is strictly limited to material things. Life processes, beyond my own doubt, also take place in subtle realities, and so then also do the disturbances in life processes which we experience as disease. If we do believe in a soul and in some form of life beyond death, we have to accept such realities and they must then be present also in relation to the living body, and actually the very source of the body's life ought to be in that which can go on living without it. Our western medicine only has access to the shadows of such realities since no instrument yet developed can measure its parameters, but still has found a hint on disease roots and processes there in psychosomatics, even though a materialistic interpretation is forcibly imposed.

The fact that *Āyurveda* works in practice, that effective cures can be derived from its diagnostic information relating to imperceivable forces and principles, proves to me that those ancient Indian scientists, in their ways to acquire knowledge, also had an access to such subtle realities our sciences fail to grasp. Therefore, I do believe we have something to learn from *Āyurveda*, even though probably no one on earth to-day understands it like in the archaic pasts – our minds seem to have limited themselves since those days, too much preoccupied with the grossly material. We seem to have left a specific mode of perception behind in the evolution.

The basic forces of life according to *Āyurveda* are the three *doṣas*: *vāta*, *pitta* and *kapha*. *Vāta* is also called *vāyu* and another word for *kapha* is *śleṣman*. The word *doṣa* means “that which vitiates” and its reason here is that all diseases have their roots in vitiation through one, two or all three *doṣas*. In the normal situation, there is a balance between the three, and they are then rather called *dhātus*, or “sustainers”, since they are the basic factors sustaining the life of the body. However, we will later deal with another set of *dhātus*, which is one reason to only use the word *doṣa* here, so that confusion is avoided. Another reason is that we primarily deal with states of disease, in which at least one of those three *dhātus* really has become a veritable *doṣa*. Disease arises when one *doṣa*, or more, is thrown out of balance and starts acting as a vitiator. Actually, the primary aim of *Āyurveda* is to prevent disease – nevertheless, its usual application to-day is when a disease has already developed.

* Lecture given in Vigliano Biellese, Italy, in Sept. 1980. [The text has been a bit improved 2005. The author's address has been changed to the actual one in all texts.]

Vāta literally means “wind” and has much too often been mistaken for its literal meaning. We dealt with this in an extreme case above. Actually, it is the factor of communication in the body, and also of the body, since it effects its movements, too. The nervous system is a manifestation of *vāta* – but not identifiable with the *doṣa* itself. I suggest that hormonal communication in the body is also governed by *vāta*.

The ancient source literature of *Āyurveda* clearly states that *vāta* itself is imperceivable to the five senses – it can only be observed through its effects. The same holds for the other two *doṣas*.

Pitta literally means “bile” and should, again, not be understood literally (as should probably not the “bile” of the Greeks, either). It is the basic factor of transformation, of digestion and metabolism, in the body. The first transformation process in the body, more directly associated with uptake of nutritive substances, takes place when the bile is mixed into the food and enables the uptake of lipids (what happens in mouth and stomach may rather be seen as preparatory processes). Perhaps we could understand the reason for the literal meaning on that back-ground. Also, the bile is an excretory path for metabolites, resulting from certain actions of *pitta*, and observation of bile (e.g., in what is vomited) gives diagnostic clues to its state. So *pitta* is connected with bile but not identifiable with it. Actually, the origin of the word has to do with “burning”. It seems possible that bile is rather named after *pitta* than the other way around.

Kapha means “phlegm”, or in its original meaning rather “that which embraces”. It “embraces” the body, i.e., gives it its shape and form (or rather: provides the material shaped and formed by *vāta* and *pitta*). *Kapha* has to do with all the material substances in the body, which are substrates for all actions of life, but is not to be identified with them. The phlegm is an expression of *kapha* and serves the diagnosis of its state, and also various phlegms “embrace” almost everything in the body as lubricants or as protectors against dehydration of tissue. Water plays an important role in the function of *kapha*, and through it, *kapha* especially forms a substrate for the actions of *pitta*.

As a summary, we may say that *kapha* is the principle which provides the substance for *pitta*, which is the principle of processes or transformations constituting life activities and functions in the body, and *vāta* is the organising principle of all that as well as a link of communication between body and mind (but not the site of the mind).

Since none of the *doṣas* can be understood according to the literal meanings of their names we have to keep the Sanskrit words, since corresponding words do not exist in western languages, because they do not know the concepts. The same holds for nearly all conceptual terms we will deal with here. Translating *vāta* as “wind”, etc., already leads the mind on a wrong track.

We last dealt with *kapha*, the basic force of life which governs the substances of the body, to give it its form and means of physical action. Now we will deal more with the actual substances themselves, but still not in the sense of western physiology, but rather as principles of substances or tissues: the seven *dhātus*, or “sustainers” of the physical

body. Those form principles of the substances in the sense that they rather hint on their functional aspects in body tissues than on their physical constitutions. Also, it appears that every actual tissue in the body has all seven of these *dhātus*, only: one prevails – that which is relevant for the purpose of the individual tissue. The muscle principle or *dhātu*, e. g., is then present in all tissues, but manifested only in the flesh. I cannot really explain that here (but I have some ideas on what they may mean). Only one hint: from sets foetal cells, which we see no difference between, i.e., of at least apparently the same material, different tissues form (muscles, bones, blood, cartilages, etc.) – as different principles manifest; therefore western medicine believes that it will one day be able to let, e. g., a kidney grow out of any cell culture of a person's body – once we get behind this secret. This yet fictitious technique is called “cloning” and could then be used for autotransplantation. It has proven possible to do with certain simpler forms of animals, but not yet with higher organised forms. The one or the other already inherent principle can, it seems, be made to “break through” and manifest, under proper influence. I think we should understand *dhātu* as something in that direction.

The seven *dhātus* are:

- *rasa* (transport-liquid principle)
- *rakta* (energy-carrier principle)
- *māṃsa* (flesh or muscle principle)
- *medas* (fat principle)
- *asthi* (bone principle)
- *majjā* (marrow principle)
- *śukra* (reproductive principle)

Rakta is sometimes identified with blood, but actually blood is what is manifested through the two principles *rasa* and *rakta*. In the series of *dhātus* just given, each *dhātu* is formed out of the previous one. *Rasa* is formed out of food taken.

The seven *dhātus* are also called *dūṣyas*, i. e. “those which are vitiated”. When a disease starts, one or more of the three *dhātus* (we prefer to generally call them *doṣas*) becomes a real *doṣa*, or vitiator. Such *doṣas* act on the seven *dhātus* and bring about disturbances as manifestations of the disease so caused. A thus disturbed, or vitiated, *dhātu* (of the seven) becomes a *dūṣya* and the disease “takes form”. The seven *dhātus* need a continuous anabolic feed and catabolic drain in order to be kept functioning. The anabolic feed is an action of *pitta*, working on nutritive material taken up from the food, and of special *pittas*, called *dhātvagnis*, which act in all *dhātus*. Such *pittas* also bring about the catabolic process, ridding the *dhātus* of no more useful material. As a result, “*dhātu* waste” or *malas* (also: *kiṭṭas*) arise. Those *malas* are carried away from the *dhātus* and to a major extent excreted, but to some degree also needed as building material for tissues of lower functionality (such as hairs and nails). Some may also to a certain degree be recycled.

At this place, it would have been of much interest to go into certain details of anatomy and physiology from *āyurvedic* aspects, where it partially more meets the concepts of western medicine than in what was discussed above. However, time only allows for mentioning that the

ancient scriptures still preserved (over 2000 years old, reflecting still earlier knowledge) give detailed descriptions of many items we believe are discoveries of modern medicine alone, such as blood formation, circulation, digestion stages and processes, urine formation, actions of body organs, etc. Besides such interesting comparisons, even processes which obviously relate to more subtle natures of matter and functions are described in such detail, that it bears witness of access to realms of knowledge we cannot easily identify – rather than being the fantasies which many a western mind may wish to ascribe them to.

We have already mentioned certain stages of the development of a disease – that the primary cause is the disturbance of the balance of the *doṣas* and that then the violation of *dhātus* follows. Actually, *Āyurveda* describes the development of a disease in much detail, and defines six stages thereof – the six *kriyā-kālas*. According to this, the first state is *caya* or accumulation, which involves the stagnation of a deranged *doṣa* (or *doṣas*) and its accumulation at its primary site, which is in the abdomen for *vāta*, in the umbilical region for *pitta*, and in the chest for *kapha*. Actually – from our phenomenological view, my friend Mr. O. M. Hinze and I feel that these are the most vulnerable places for the respective *doṣas*, rather than their actual sites of major activity, and therefore where they first fail in case of disturbance. The reason is that we would rather expect *kapha* to be located in relation to the digestive organs and *vāta* to be located towards the head, and that it is logical to expect that a deranged *doṣa* will first fail where it has its least activity and its function to be preserved last where it is the most needed. The second state in the development of a disease is *prakopa* or provocation, in which the *doṣa* becomes excited at its primary site (or loss of *doṣic* activity becomes a functional problem in the weak places, in our phenomenological view). Up to here, symptoms are vague and difficult to locate. The third state is *prasara*, or migration, in which the accumulated excited *doṣa* spreads over the body, from the primary site (or the functional disturbance at the weak place begins to involve other locations). Now symptoms begin to be a bit more clear, but still not specific. The fourth state is *sthānaśaṃśraya* or localisation, in which the excited *doṣa* settles in certain tissues or organs (or in which certain weak organic functions, due to constitution or whatever, can no more bear the reduction in *doṣic* sustenance, so that weak points in functions of organs and tissues now tend to give in for the hitherto more general strain on the system). Now specific and localisable symptoms arise. This corresponds to the prodromal stage in western medicine. The fifth state is *vyakti*, or manifestation, also called *rūpa*, in which the disease fully manifests in the organic dysfunction or tissual disorder. The symptoms are now clear and fully referable to organs and tissues involved. The sixth state is *bheda*, or resolution, which is the final outcome: recovery, complication, a chronic state or death.

In the first four stages, the treatment aims at holding back further development and correct the *doṣic* imbalance. This is the true sense of radical treatment – that the root of the disease, rather than its manifested appearance, is acted

upon. In the fifth stage, the manifested form of the disease also has to be treated, such as through keeping disturbed organs functioning, restoring tissues and reducing harmful symptoms. Therefore, palliative actions are also required here, as well as prevention of complications and lasting effects. In the sixth stage, unless the disease ends in death, restorative actions may be needed.

Now we have dealt with cause, effect, spreading and manifestation of disease within an entity in a general sense. It remains to say a few words on what has attracted this to the person and what can be done about it.

Disturbances in the balance of the three *doṣas*, which is the intra-individual root of the disease, are caused by extra-individual misrelations – disharmony with the environment, be it through conflicts, attitude, diet, misadaptation to local circumstances, accidents, natural catastrophes, etc. This environment not only embraces the material world around us, but can also involve subtle realities and even the past as a kind of temporal environment (karmic factors). The way to stay healthy is, therefore: right attitude (including right thinking), proper diet (in relation to local and seasonal conditions), proper care of body and mind, proper action (karmic effects) and religious activities (proper relations to non-material realities). Such requirements also involve the need for relaxation and enjoyment to a sufficient but not exaggerated extent (too little and too much both make for disturbed states), as well as acquisition of what is necessary for the activity in the society. All this is expressed in three words: *dharma* (duty), *artha* (necessary property, without excess) and *kāma* (enjoyment, including sexuality, without excess).

The environmental influences leading to disease, which come from the environment or from individual misfunctions in the environment, are clearly classified in *Āyurveda* into different groups of causes. It would here carry too far to go into such details.

People react differently to misrelations with their environment and have different individual needs. Each person has his individual *doṣic* constitution. One talks about *vātic*, *paittic* and *kaphic* constitutional types or *prakṛtis*, and all possible combinations thereof depending upon the individual strengths and sensitivities of the *doṣas*.

When a disease is established, something should, of course, be done about it. First, we need a diagnosis and then a therapy. The primary thing in the diagnosis is, here, to find out about the state of the three *doṣas*, in order to enable corrective actions against their misbalance. Then, we also want to know how and how much the seven *dhātus* are already involved so that we can reverse deranging processes and correct for misfunctions and disturbances. Finally, we must assess the physical condition of the body and its organs and, where needed, the patient's state of mind. Relating to the latter is the determination of the stage reached in the six *kriyā-kālas*.

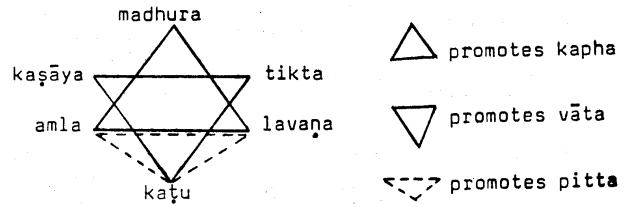
Such diagnosis is performed by means of observation, using nearly all organs of perception, and by means of taking the person's history. We wish to find out about his relations to his environment, now and in the past, to get to know his *prakṛti* and of course learn the development of his actual disease. One important method to judge the state

of the *doṣas* is the pulse lore, *nāḍiparikṣa*. The trained *vaidya* (*āyurvedic* physician) can detect significant signs in the pulse characteristics, which reflect the state of the *doṣas*. Since the *doṣas* govern everything in the body, they also govern function and movement of heart and blood as well as the condition of the blood vessels. This may bring some brief understanding on how this is possible. However, I think there is more to it and the pulse lore should certainly be a promising field of basic *āyurvedic* research, since even western methods as pulse recording, plethysmography, oscillography and the like could be applied, to some degree connecting the two worlds. On the other hand, bringing in such instrumentation requires a great deal of caution and consideration of the methodological limitations – the instruments can only detect what they are designed to detect and do not prove the non-existence of what goes beyond their limits just because they fail to indicate it. Properly used, I think such a technical approach might offer a way to prove the existence of the *doṣas* in a way which is acceptable to western science; improperly used, they could only give more power to scientific prejudice.

Once a diagnosis is done, the corresponding therapy can be given. One important part of therapy is the *pañca-karma* – the “five actions”, not so much used to-day, because of requirements in time and money, as it is advocated in classical *Āyurveda*. Provided that the state of the patient is such that he can take this treatment, and such that it is beneficial for him, he is passed through elaborate physiotherapy, mainly consisting of oral and external treatments with oil, inducing of vomiting and sweating, giving purgatives and, as an important feature, *vasti* or enema with medicated oils and astringent decoctions. This acts on the *doṣas*, *vasti* especially on *vāta*, and cleanses the *dhātus*, so that remedies given can be more active. A simile used to explain the latter is: “before you dye a cloth, you must wash it.”

The remedies given are composed according to a special pharmacological theory. All substances in the world can be classified in certain groups according to their actions in the body and their effects on *doṣas* and *dhātus*. Given the diagnosis, we can define the actions and effects needed and then choose the proper medication. One special advantage of this approach is that not the medication itself but its action is primarily defined and therefore one often has a choice of several alternatives and can take what is most readily available. Certain herbs do not grow everywhere, or are not available in all seasons. However, the specifications arrived at allow to choose the most appropriate of what is at hand. And since every substance has an action on the body, every substance is a potential remedy and it is always possible to find something with a desired action.

Those groups of classification are: *rasa* (taste), *guṇa* (property), *vīrya* (potency), *vipāka* (taste after digestion) and *prabhāva* (special action). The *rasas* or tastes are: *madhura* (sweet), *amla* (sour), *lavaṇa* (salty), *kaṭu* (pungent), *tikta* (bitter) and *kaṣāya* (astringent). They act promotingly on the *doṣas* according to the following graph:



Those which do not promote the activity of a *doṣa*, reduce it.

According to this relationship, we can choose both a diet and a remedy which have desired actions in relation to the states of the *doṣas*. A healthy diet is well balanced in the *rasas* – in relation not only to the mixtures in a meal (which should not be disharmonic and not have conflicting actions), but also in variations from one meal to another, in relation to the individual *prakṛti* and in relation to local and seasonal requirements.

The *guṇas* are 20 characteristics, like heavy–light, cold–hot, viscous–dry, soft–rough, etc. They are grouped as oppositions, even though they are not “diametrical” in nature in all cases (viscous–dry is not as “diametrical” as wet–dry would be, but the former is the proper pair here and has special reasons). These also have their corresponding actions on the *doṣas* as well as on the *dhātus* – mainly according to homological relations in the latter case.

These two groups of properties of substances are both related to primary qualities of substances in their original states.

Vīrya is the potency of a remedy, classified as *uṣṇa* (hot) or *śīta* (cold). In the figure above, those *rasas* which are in the upper half (*madhura*, *tikta*, *kaṣāya*) are of *śīta vīrya*, and those below of *uṣṇa vīrya*. The 20 *guṇas* are listed as opposites such that one side represents *śīta vīrya* and their opposites *uṣṇa vīrya*. The *vīrya* is the final action at the location in the body, which the substance reaches: *uṣṇa vīrya* increases the activity there and *śīta vīrya* reduces it.

In an alternative view, there are 8 *vīryas*, being 8 specific *guṇas*. Actually, the 20 *guṇas* are reduced to the 8 in the digestion process, and then to the two *vīryas* when the substance reaches the site of action, which is determined, e. g., by homological primary qualities.

Vipākas are three tastes, to which the six *rasas* are reduced in the digestion process: *madhura* and *lavaṇa* become *madhura*, *amla* stays *amla* and *kaṭu*, *tikta* and *kaṣāya* become *kaṭu*. Accordingly, there are three stages in the digestion pathway: *madhura bhāva* (sweet stage – mouth and esophagus), *amla bhāva* (sour stage – stomach and small intestine) and *kaṭu bhāva* (pungent stage – large intestine). The *vipākas* indicate the effects in terms of *rasas* of the digested substances, such as they have entered the body and now act in the metabolism.

Prabhāva is special action. Some substances have actions which cannot be determined according to tastes and physical characteristics. I think that synthetic drugs are typical examples, often tasteless and without specifiable physical quality and yet with a sharp action, only rarely without side effects. Of course, those have not been classified in *Āyurveda*, but certain natural substances with special actions have. The natural substances, though, usually

have soft effects on the body, with no real side effects (except for disharmonic or adverse effects if improperly chosen or combined). The synthetic drugs have sharp and basically poisonous effects and therefore must be carefully dosed in relation to their destructive potencies. Oversimplified, the natural substances mainly promote needed processes and states whereas the synthetic drugs mainly have a destructive effect on undesired processes and states. This philosophy of “poisons” (or: brute force) in the school medicine is also reflected in that almost the only herbal agents accepted in it are those of especially poisonous herbs, like digitalis, reserpin, ergotamine, opium derivatives and so on. Those with soft actions are labelled and advocated as “inactive” by the propaganda of chemical companies. Of course, one special interest in such propaganda is the incomparable profit attached to synthetic drugs, as well as the monopolistic possibilities (herbs cannot be patented as can not their preparations, but synthesisation processes can – therefore herbs are “uninteresting” and minds should be programmed not to believe in them; such propaganda also keeps very quiet about the fact that most synthetic drugs have their origin in herbal agents, synthesised and modified and made more “active”, i. e., “poisonous” – an old example is acetylsalicylic acid – salicylic acid is an agent in a shrub called *Salix* in Latin and is modified through acetylation. We use it by large amounts since 100 years in Aspirin and similar brands without knowing its origin; similar links can be exhibited for most synthetic drugs, even though the degree of modification is often much higher, or also a step from the herbal agent to a chemically related synthetic agent has been taken). Inactivity of a herbal agent is, however, in many cases natural if this agent is isolated from a complex of substances in the herb itself, with synergistic actions. Therefore “inactivity” of an isolated substance from a herb does not prove inactivity of the herb itself. The herb does have *rasas*, *guṇas*, *vīryas* and *vipākas*, but if the isolated substance has not to any important extent and even lacks *prabhāva*, it has simply been taken out of its “context” and rendered inactive.

Therefore, studies on isolated herbal agents cannot reveal the real effect of the herb itself and certainly not prove inactivity. Surely, synthetic drugs have their important places, especially in acutely dangerous situations, where a quick and sharp action may be desired, but the devaluation of herbs is a political move without truly scientific grounds, even if scientific arguments are brought out of the context. The reason is simply that there is less profit in the “soft path” – and sometimes more work for the physician. Inactivity can also be “proven” through measurement of the wrong parameters – I know of one case where a herbal remedy against claudicatio intermittens was labelled “inactive” because it had no measurable vasodilative effects, whereas walking tests in the clinic showed remarkable improvements. The latter was, of course, not discussed, even though the use of vasodilative drugs in claudicatio has arisen much controversy even in school medicine.

But let us now return to the *āyurvedic* classification of herbs and natural substances and try to understand what

they mean. Certainly, “the taste is a primary reaction of the body to a substance, released by its action upon the tongue. It is logical that it should have some relation to further reactions of the body to the substance. Obviously, according to the above, the three *doṣas* act in the tongue, as well as everywhere else in the body. Therefore, the effect of the substance on the *doṣas* will already take place when it is tasted. Let us assume that there is a relation between the sensation of a taste and the balance of the *doṣas* in the tongue, even though I have not found any details on this in *āyurvedic* literature. Then, certainly, the taste of a substance reflects its effect on the *doṣas*.

The 20 *guṇas* all have relations of homology to certain tissues in the body, and their effects, and especially the site of action of a substance in the body, can be understood accordingly.

Furthermore, the 20 *guṇas* characterise perceptual qualities of the material – how our organs of sense react to it. Again, all organs of sense are governed by the three *doṣas* and we would expect some kind of correlation between the reaction of these organs and the influence on their *doṣas*.

However, *Āyurveda* has a much more detailed and exact explanation for such relations. According to *Sāṃkhya*, the famous systematic natural philosophy of India, the ultimate stage in the creation, on the side of the object, was the formation of physical matter in five modes, the five *mahābhūtas*. Since “five” is *pañca* in Sanskrit, one refers to the *pañcabhūtic* theory of matter, which in *Sāṃkhya* is of a kind of continuum nature, and in the related *Nyāya-Vaiśeṣika* philosophy takes a corpuscular form. According to these theories, every possible physical substance has all of the five modes or “elements” inherent: *ākāśa* (“space”), *vāyu* (“wind”), *tejas* (“fire”), *ap* (“water”) and *pṛthivī* (“earth”). As an example, let us look at a cube of ice in a glass. It has a distinct own shape; it is solid, i. e. “earthy”, and in this state its *pṛthivī* component is predominant. If we apply some heat, its inherent *tejas* or “fiery”, i. e. transformative, component will enable the transit from one mode to another – it melts and becomes a liquid, no more having a distinct shape of its own, but a compliant shape, taking on the form of the glass. The *ap*, or “liquidity” component has now become predominant. If further heat is applied, its inherent *tejas* will become much more active and vaporise the water to gas. Here the *vāyu* component is predominant, characterised by shapelessness and motion (as expressed by “wind”) towards the boundaries, so that the gas fills the space available. In the *ap* state, the water still had a more or less constant volume, whereas its shape was compliant. In the *vāyu* state, its volume is also compliant and no kind of own shape can be found. In every mode of appearance this quantity of water occupies some space, *ākāśa*. A basic characteristic of all physical matter is that it requires its own space – two pieces of matter cannot share the same space (not even gases, viewed on a molecular basis).

Thus, this theory has only been briefly touched upon. It further involves a specific relation between the *pañca-mahābhūtas* and the organs of perception.

<i>ākāṣa</i> :	hearing
<i>vāyu</i> :	touch
<i>tejas</i> :	sight
<i>ap</i> :	taste
<i>pr̥thivī</i> :	smell

(which actually is more directly given through the corresponding *tanmātras*, but we cannot go into all these elaborate details here). Now, also the *doṣas* have their predominant *pañcabhautic* characteristics:

<i>vāta</i> :	<i>vāyu</i> + <i>ākāṣa</i>
<i>pitta</i> :	<i>tejas</i> (+ <i>ap</i>)
<i>kapha</i> :	<i>ap</i> (+ <i>pr̥thivī</i>)

Furthermore, the six *rasas* have their predominant characteristics, too:

<i>madhura</i> :	<i>pr̥thivī</i> + <i>ap</i>
<i>amla</i> :	<i>pr̥thivī</i> + <i>tejas</i>
<i>lavaṇa</i> :	<i>ap</i> + <i>tejas</i>
<i>kaṭu</i> :	<i>tejas</i> + <i>vāyu</i>
<i>tikta</i> :	<i>vāyu</i> + <i>ākāṣa</i>
<i>kaṣāya</i> :	<i>pr̥thivī</i> + <i>vāyu</i>

Comparing these listings, the relations between *rasas* and *doṣas* are immediately obvious. In the same way, all the 20 *guṇas* have their predominant *pañcabhautic* characteristics, which exhibit relations to the *doṣas*. Again, the seven *dhātus* have such characteristics, too, explaining relations to *rasas* and *guṇas*. Furthermore, *doṣas* and *dhātus* have their characteristic *guṇas*.

The continuation of the theory of *tanmātras* (prestages of actual physical matter) and *mahābhūtas* into the corpuscular theory of *Nyāya-Vaiśeṣika* has been called an atomic theory. However, our atomic theory has nothing to do with it, being the result of a study of matter from an entirely different aspect. (The only connection is that the Hindi language has adopted the word “*paramāṇu*”, being an ancient *Nyāya-Vaiśeṣika* term for a basic quantity of matter, for atom in the modern sense – just as we use the Greek word “atom” in a different sense to-day than what it was originally meant to mean by the Greeks.)

Actually, as a further kind of classification of substance, besides *rasa*, *guṇa*, *vīrya*, *vipāka* and *prabhāva*, the predominant *pañcabhautic* characteristic is also relevant and sometimes referred to, as well.

Now, we have had a very brief review of *Āyurveda*, leaving many details out (like subdivisions of *doṣas*, classifications of diseases, the detailed knowledge of the metabolic actions of *pitta*, and much more). What has been treated could only be briefly described. It may, just for the comparison, be mentioned that *Āyurveda* has eight branches, very similar to the branches of western medicine: inner medicine, paediatrics, psychiatry, diseases of the head, surgery, toxicology, gerontology and andro-/gynaecology. Therefore it is sometimes referred to as the “eightfold” or the “octopartite” (*aṣṭāṅga*).

A question here naturally arises: what can *Āyurveda* mean for us, in the west? We could probably learn the

methodology of diagnosis, but what can we then do with it? *Āyurvedic* natural remedies are not available here and many countries have hindering import restrictions on medical products, not acknowledged by the school medicine. Of course, we do have our own herbs, but they usually are unknown to *āyurvedic* source literature, since they do not grow in India, and therefore we cannot easily find out about their *āyurvedic* characteristics. Actually, the determination of *rasa* (except the predominant), *guṇa*, *vīrya*, *vipāka* and *prabhāva*, as well as the predominant *mahābhūtas*, is very difficult for us to-day (remember, I mentioned that our minds seem to have left a mode of perception behind in the evolution). In India, they are known since ancient times.

Certainly, we will be able to identify a limited number of herbs, which grow here as well as in India, and find a few more which are close relatives to such known to *Āyurveda*. Also, the mineral substances are more or less the same. This gives us a limited possibility of application of natural remedies according to *āyurvedic* principles.

However, much more practical for us is the dietetic aspect of *Āyurveda*. Many food items we use are known to *Āyurveda*, as well. Here, the *rasas* or tastes play a more important role than in herbal remedies (which often have less noticeable tastes and then more relate to the other characteristics), and we can at least identify the predominant tastes (*Āyurveda* knows secondary tastes, too). We can always compose a meal such that it has a desired effect on the *doṣas*. Furthermore, we should be able to find ways of determining certain homologies between food items and *dhātus* needing regeneration. To a limited extent, we may also be able to use some forms of physiotherapy according to their *āyurvedic* effects in the *pañcakarma*.

We can only hope that, in addition to those possibilities, we may in the future be able to have some access to a few of the more important (natural and non-toxic!) *āyurvedic* remedies also in the western part of the world – imported from India (if monopolistically protective restrictions, brought about by the school medicine, can be overcome through common sense), or produced here from local and imported herbs.

That *Āyurveda* does work in practice has even been officially recognised by the WHO, which operates a Study Group on Traditional Medicine and investigates ways of integrating *Āyurveda* into primary health care and social health systems in India. Furthermore, it carries out several research projects which have already clinically demonstrated the effects of certain *āyurvedic* therapies. The revival of *Āyurveda* in India is done for good reasons.

As a conclusion of this lecture, I would like to gratefully refer to my main sources of learning on this subject: late professor Chandragiri Dwārakānāth, who became a good friend, Dr. Lokendra Man Singh of Vārānaśī (later in Kāthmāṇḍū), who, as well as professor Dwārakānāth, came to us for giving lectures, and my friend Mr. Oscar Marcel Hinze, whose knowledge of Indian philosophy and phenomenological insight have been a great inspiration.

SECOND THOUGHTS ON ĀYURVEDA

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ABSTRACT: This article takes up a few “riddles” in the theory of *Āyurveda* and suggests explanations. It also looks into the *mahābhūtas* in pharmacology and discusses the real causes of diseases, which lead to the disequilibrium of the *doṣas* a disease starts with. An interesting graphic representation of the six *rasas* is also presented.

There are some “riddles” in the theory of *Āyurveda*, some statements, which at a first glance appear astonishing – even though confirmed in practice – for which no explanations are given in the classical scriptures. I do not doubt that such explanations have been known, but they will then have been lost in the tradition. Several ancient scriptures are regrettably lost and *Caraka Saṃhitā* is only a brief reconstructive summary of the no more available *Agniveśa Tantra*. I suppose that such explanations were given in the latter and, may be, in other lost scriptures. In this article, I have taken up a few such “riddles” and suggested possible explanations.

Polarities and the “seats” of the *doṣas*

The tradition of *Āyurveda* states that the *sthāna* or main centre of *vāta* is in the lower abdomen, that of *pitta* in the umbilical region and the centre of *kapha* in the upper chest and also the head. This doesn't fit very well with the activities of the *doṣas*, which I mainly understand as follows:

VĀTA: organising activity – supervising, organising, coordinating and controlling the various activities and processes in the body, as well as providing for communication or information exchange between organs and parts of the body.

PITTA: transforming activity – digestion, metabolism with ana- and catabolism, as well as various transformations everywhere in organs and tissues.

KAPHA: supply system – providing material for the actions of *pitta*, acquired in the digestion (through other actions of *pitta*), distributed in the body and supplied at various sites of *pitta* activities – also taking care of wastes and excesses.

In a burning fire, the fire itself corresponds to *pitta*. The wood as well as the one putting it into the fire (who also scratches out ashes and unburned residues) corresponds to *kapha*. The air, but furthermore a bellows and the one using it to control the fire (who also gives orders to the person supplying wood), correspond to *vāta*, in this view.

This lets us compare (not identify!) the *doṣas* with the following body systems:

VĀTA with the nervous system, but also with the hormone system and blood supply regulation (not the blood itself).

PITTA with digestion; and metabolism in the widest sense (including “digestion” of sensory perceptions in order to transform them into information for the mind),

KAPHA with acquisition and supply of nutrients via blood and other body fluids as vehicles (but not the blood itself), and, furthermore, drainage and sewage, ridding body systems of wastes.

Now, how can this be made to fit with the *sthānas* or “own places” of the *doṣas*, as stated in *Āyurveda*? We would rather expect the centre of *vāta* to be in the head and that of *kapha* to be in the abdomen, and not the other way around.

Let us look at an organism developing a disease. The *doṣas* are out of balance, they are under stress or tension, but the body tries to maintain their functions everywhere for the sake of maintaining life processes. Finally, a point is reached at which the body is no more able to do it and has to sacrifice a *doṣa* activity somewhere and yield a bit to the tension. Where will it do it? Of course, where the *doṣa* is *least* needed. It will up to the end strive to maintain the function of the *doṣa* where it is most needed. Where the body yields first, we have the weak or sensitive places for the *doṣas* and also the locations where the symptoms of a *doṣa* disturbance will first be noticed. For *vāta* and *kapha*, we thus find a kind of up/down polarity between the head and the abdomen:

<u>Doṣa</u>	<u>most needed in</u>	<u>least needed in</u>
VĀTA	head	abdomen
KAPHA	abdomen	head

Thus, the “own places” of *vāta* and *pitta* really are their weak regions, where they are least needed and first yield when the function can no more be maintained. The mentioning of the chest as the primary specific “place” of *kapha*, and the head as a secondary, may be due to the fact that the air passages are most prone to show early symptoms of *kapha* disorders. But the hormonal functions of the thyroid and parathyroid glands play an important role in communication in the body, which gives them a special

role in the *vāta* system. Their location in the front of the neck at the upper chest also puts them into this polarity.

For *pitta*, the polarity is different. It is no more between the upper and lower ends of the trunk, but it is **central** versus **peripheral**. Metabolic activities in certain vital organs, more or less peripheral to the umbilical region, have to be maintained under almost any circumstances. However, the digestion can be sacrificed for a period of time without grave consequences for the body. The activities of the brain can stop only for very few minutes, or human functions will deteriorate irreversibly, but the digestion activities can be arrested for several days without major consequences. The weak place of *pitta* is, therefore, the umbilical region. This is where it is the least needed – for the moment – whereas it is desperately needed in certain organs, which are “peripheral” to that region.

Vipākas

The “reduction” of the six *rasas* to only three in the digestion, called *vipākas*, is another case where it seems that explanations have been lost in the tradition. It is difficult to understand, why and how this should occur, and also, why the original six *rasas* should have so much importance if, at the end, only three of them remain.

According to Caraka and others, the *vipākas* are *madhura*, *amla* and *kaṭu*. Now, we find the same as stages of digestion: *madhura bhāva*, *amla bhāva* and *kaṭu bhāva*. This parallelism is striking, too striking to be just a coincidence...

Could it be that *vipāka* does not really have to do with modifications of tastes in the substance itself, due to digestive processes, but rather with the stage in the digestive sequence, where the substance is mainly digested and absorbed into the system? If this is so, *madhura vipāka* – for example – would not mean that a salty substance becomes sweet – anyway difficult to conceive chemically – but that it is mainly absorbed into the system already in the *madhura* or sweet stage of the digestive process. Thus, it would retain, its *rasa* characteristic after absorption, which, therefore, would still be of pharmaceutical importance. In addition, it will then have a certain pharmaceutical relevance that the absorption takes place here and not in another stage.

A substance having *madhura vipāka* would then be absorbed, in a very early stage of the digestion and become almost directly available to *kapha* with a minimum of digestive transformation, which could explain why it promotes *kapha*. An *amla-vipāka* substance reaches the main stage of digestion, in which its transformed or released parts may even participate in or aid the digestive transformations taking place here, which could explain why it promotes *pitta*. A substance with *kaṭu vipāka* would then undergo a more elaborate transformation before it is absorbed towards the end of the digestive process. This could involve that certain of the constituents are refined to

a higher degree. More refined nutrients are likely to be the ones needed for the activities of *vāta*. This may give some idea about why such a substance promotes *vāta*.

Suśruta's view of only two *vipākas* could with reference to the above be seen as simply another division of the alimentary tract in this respect, in an upper and a lower part.

The eight vīryas

Besides the pair of two *vīryas*, which are *saumya* and *āgneya*, reap., another view relating to eight *vīryas* is mentioned. According to Caraka and others, they are:

<u>saumya vīrya</u>	<u>āgneya vīrya</u>
<i>guru</i>	<i>laghu</i>
<i>śīta</i>	<i>uṣṇa</i>
<i>snigdha</i>	<i>rūkṣa</i>
	<i>tikṣṇa</i>
	<i>mṛdu</i>

The division into *saumya* and *āgneya vīryas* is according to Dwarakanath [1], deduced from the *pañcabhautic* compositions.

The question has already been raised in āyurvedic literature [2], why *mṛdu* appears here and not *manda*, instead. *Manda* would pair *tikṣṇa* as a corresponding *saumya vīrya* and we would then have four *vīryas* in each group. It has also been suggested [3] that this should be the case and that *mṛdu* instead of *manda* could be a mistake somewhere in handing down in tradition. I find it difficult to believe that such a mistake could have taken place and remained undiscovered by so many prominent vaidyas.

If we now again take a look at the *vipākas*, they are said to have the following *guṇas*:

MADHURA VIPĀKA:	<i>guru, śīta, snigdha, mṛdu</i>
AMLA VIPĀKA:	<i>laghu, uṣṇa, snigdha, tikṣṇa</i>
KATU VIPĀKA:	<i>laghu, uṣṇa, rūkṣa, tikṣṇa</i>

according to Dwarakanath [4], apparently from considerations of the commentaries by Hemādri and Aruṇadatta. These are the same *guṇas* as those which are mentioned as eight *vīryas*. Here, *mṛdu* is included, but not *manda*. The striking parallelism will not be without meaning. The view of eight *vīryas* is likely to have some connection with the *vipākas*. But how? If we assume the above hypothesis concerning the *vipākas*, this would mean that substances absorbed in the corresponding stages of digestion, would primarily have those *guṇas*, putting them in a special position.

Certainly, many questions are still open concerning both the *vipākas* and the view of eight *vīryas*, but these ideas could hopefully be an impulse for further studies.

The *pañcamahābhūtas* and the classification of drugs

The system of drug classification in Āyurveda has put it into the unique position to have a *systematic pharmacology of natural substances*. Except related systems like Siddha and Tibetan Medicine (the latter adopted these aspects from Āyurveda), no other medical system has such a systematic approach, but is mainly based on empirical knowledge of actions of herbs and other substances. An attempt for systematisation was tried in medieval European medicine, leading to the theory of signatures, which, however, turned out to have quite a limited applicability. Even allopathy is to a great extent empirical in its pharmacology. Though today guidelines are set by acquired biochemical knowledge, actions of drugs cannot be more than roughly or presumably predicted and experimental studies are necessary, which over and over again reveal unexpected actions, or also the lack of expected actions. The necessary “cut-and-try” is actually a dilemma of the chemical pharmaceutical industry, since the experimental studies which have to be performed are time consuming and very expensive. It has been estimated that of 5000 chemical compositions chosen as potentially effective on a theoretical basis, only one turns out to have the desired effect – not to speak of simultaneous side effects... Still, the medical industry in the West sticks to this path for certain reasons. One is that it offers vastly higher profits than can be had with natural remedies, since synthesised preparations can be **patented** (at least through their synthesis procedures) and thus put the manufacturer in a monopolistic situation, in which he can dictate prices. This, I believe, is even the main reason and it has heavily politicised the market in Europe. Manufacturers are influencing politicians to introduce legislation in favour of allopathy, working to eradicate the uncomfortable competition of natural remedies from the market – so much more since the public increasingly prefers the latter. After all, money, and not humanitarianism nor common sense, is what rules the world.

Since everything is based on the five elements and has them in the corresponding state of balance in normal and healthy conditions, a disorder in the biological system can be associated with a disorder of the elements. They have in that case come out of balance and there is excess or deficiency of one or more of them. The diagnosis strives at determining such imbalances. The action this leads to is to reconstitute the balance through decreasing or increasing the corresponding elements. If herbs and minerals are classified in terms of their compositions of elements, this reconstitution can be achieved through an appropriate choice of them. We, therefore, have the following sequence of actions:

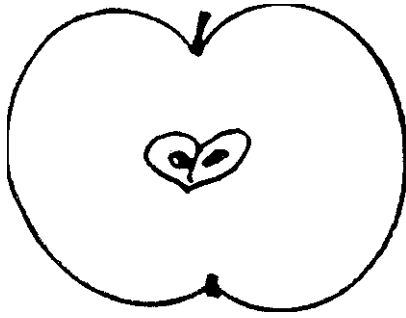
DIAGNOSIS → EXCESSES OR DEFICIENCIES OF MAHĀBHŪTAS → SPECIFICATION OF MAHĀBHŪTAS TO BE REDUCED OR INCREASED → SELECTION OF SUBSTANCES HAVING LITTLE OR MUCH OF SUCH MAHĀBHŪTAS.

Thus, the specification of the remedy that is needed can be deduced from the diagnosis in an almost mathematical manner! No other medical system has this extraordinary feature (except for the above-mentioned related systems). Furthermore, this leaves a freedom of choice. There will be several herbs, minerals and other natural products that fulfil the specifications arrived at, and that substance can be chosen which is available at the actual time and place. Not all herbs are available throughout the year and everywhere, but there will always be something available, which corresponds to the actual specification.

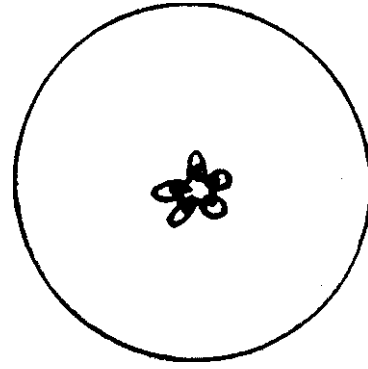
This system has one difficulty for us. We are not able to judge the *mahābhautic* composition of a substance like the ancient *ṛṣis* could. Therefore, they devised an alternative classification principle, more adapted to our sensory organs, as an intermediate step. The properties in terms of *mahābhūtas* can be translated into terms of *guṇas*, *rasas*, *vīryas* and *vipākas*, mainly stating the same in “another language”. As a simile, we may look at an apple in different sections, as drawn in Fig. 1. The *ṛṣi* is able to see the whole apple, but we are not and have to be satisfied with a section. The one section is vertical, the other horizontal. The one illustrates the aspect according to the five *mahābhūtas*, the other according to *guṇas* etc. They show the same thing in different aspects, only optically different. Since in one aspect a few details are not seen, which appear in the other aspect, there will be some exceptions: *prabhāvas*. However, one aspect is much easier for us to handle (even though it still requires a lot of training), being especially adapted to our sensory organs:

GUṆAS:	touch and observation
RASAS:	taste
VĪRYAS:	thermal sensations
VIPĀKAS:	sensed or observed behaviour in our digestive process.

Interestingly enough, there is no classification aspect based on smell or sound (even though some *guṇas* could be remotely associated with sonic behaviour, such as “hard” and “soft”). Perhaps the discovery in the West of aromatherapy could add something to this, but it is – again – empirically based. Also, the beneficial influence of music and bhajans is known from other scriptures. It has been independently investigated in the West as “music therapy” (mainly of a psychological nature). Both (these Western approaches are what is called “alternative” – i.e., they do not fall within the framework of allopathy.



Pañcamahābhūtas



Rasa - guṇa - vīrya - vipāka

FIGURE 1

The rasa star

An interesting graphic arrangement of the *rasas* in relation, to their effects was independently discovered by the author and O. M. Hinze [5] along somewhat different lines. It is shown in Fig. 2. It was furthermore found that this figure has certain axes of division, marked with dashed straight lines, which relate to *guṇas* and *vīryas*. A third axis of division, separating, on one side, *madhura*, *tikta* and *amla* from, on the other side, *kaṭu*, *lavaṇa* and *kaṣāya*, could so far not be related to *guṇas* or other properties.

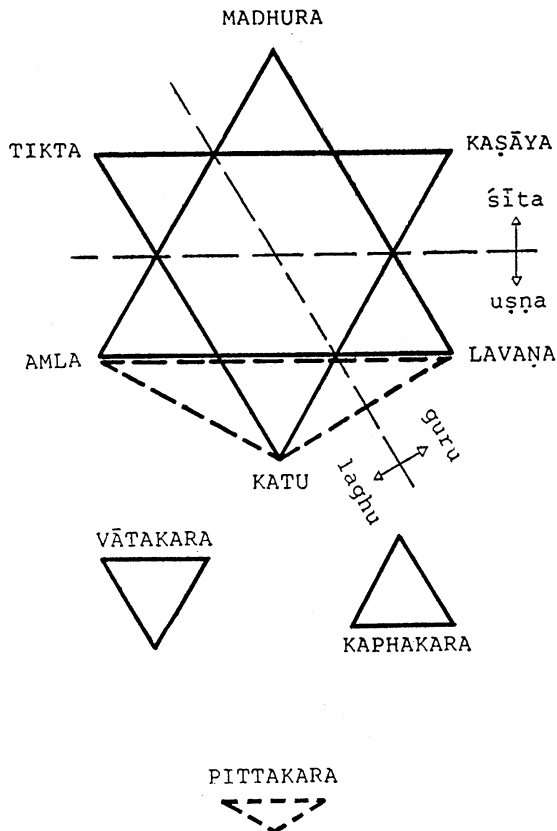


FIGURE 2

Hinze points out that this is the same figure, a hexagram, as the planet Mercury produces in the sky between points of conjunction with the sun [6]. This is interesting since “*rasa*” also means the metal mercury, which in Alchemy

is associated with the planet Mercury, and since this planet and its hexagram are associated with the *cakra svādhiṣṭhāna* [6,7], related to the *mahābhūta ap* or water. *Ap* or *rasa tanmātra* is associated with taste. Furthermore, the planet Mercury is the one that governs taste and the tongue according to medieval European astrology.

The author's line of reasoning was to find a symmetrical arrangement, being inspired by the heptagram and the seven-pointed star relating the order of the planets to their associated week-days, as known in astrology. Since the *rasas* are six and, furthermore, their effects on the *doṣas* relate to groups of three, the figure can only be a hexagram, and the lines of division then defined the exact positions. Hinze's line of reasoning started from the association of the planet Mercury with taste, mentioned above, wanting to find an allocation of the *rasas* on the Mercury hexagram. The associated 6-petalled *cakra*, *svādhiṣṭhāna*, has a structure 3 + 3 in its petal syllables [6] – three labials: *ba*, *bha*, *ma*, and three semi-vowels: *ya*, *ra* *la*. Correspondingly, we have another structure 3 + 3 in the *rasa*-star: three *vāta*-promoting and three *kapha*-promoting *rasas*.

Hinze has also looked into the sequence of the *rasas*. Two different sequences are given in the literature:

- madhura* - *amla* - *lavaṇa* - *tikta* - *kaṭu* - *kaṣāya* (Seq. 1)
- madhura* - *amla* - *lavaṇa* - *kaṭu* - *tikta* - *kaṣāya* (Seq. 2)

Seq. 2 can be motivated by the fact that adjacent *rasas* promote the same *doṣas*, resp., and Seq. 1 by the fact that it is also the sequence of the relative strengths of the *rasas*. Furthermore, Seq. 1 along the hexagram corresponds to the temporal order of the points of the Mercury hexagram, as it is formed in the sky. This shows that the first sequence is the correct one.

The *vīrya*-axis of division was pointed out by Dr. L. M. Singh (Vārāṇasī) as the author showed him this arrangement during a course he gave in Europe in 1979. The other axis was found by the author. These axes define the order of the *rasas* along the star. Hinze arrived at the same

order from the discussed relation to the way the Mercury hexagram is formed.

The real cause of disease

A disease begins in the body with a disturbance of the balance of the *doṣas* – but what causes such a disturbance? What comes before it, while the *doṣas* are still in balance? It is always a **conflict**, and thus has to do with *karma* in the widest sense. A conflict with:

- spiritual realities or the Divine: ignorance, atheism, hypocrisy, blasphemy etc.,
- other persons: egoism, greed, aggressiveness, pride, untruthfulness, arrogance, discrimination, racism, abuse, caste-repression, cheating and so on,
- nature (with its animals and plants): greedy and destructive exploitation, carelessness, neglect, environmental destruction, materialism...
- ourselves (at present): psychological self-conflicts, complexes, fears, feeling of guilt, cowardliness....
- our past, i.e. conventional *karma*: consequences of past actions; what we did that we shouldn't have done, but also what we should have done but did not do, especially in relation to others.

This can also be related to the sevenfold classification of *duḥkhas*.

We can put it all in a simple formula: Whatever you do unto others will be done unto you! (Including failure of acting as a special aspect of action). The others are the human beings around us, irrespective of race, caste, creed, sex, culture, religious views and so on – but also other life-forms: animals, plants and even nature itself as a gross system of life. Our actions hit back on ourselves. Sometimes in the same way as we did it, sometimes in a different but representative way. This is what great *avatāras* have always taught – various Indian *avatāras*, Buddha and Jesus.

And why is that? As a punishment? No, as a lesson! So that we can change our behaviour and develop our ethics and morality, overcome our egos and finally begin to understand the essential. There is no *karma* for pure punishment but always as a blow that hits out another piece of the rock, so that it at the end becomes a beautiful sculpture. The stubbornness of our egos usually makes us choose this painful way out of ignorance. The ego does not want to understand the uncomfortable but essential truths. We do not want to change and learn the lessons deliberately, so that we then must have it the hard way, when no other alternative is left.

The primary path to health is, therefore, not simply caring for the balance of the *doṣas* – which can even become quite selfish in attitude and therefore fail by itself... – but much more the avoidance of conflicts. The development of our understanding for others, that we in reality are all brothers and sisters out of the same one and only Divine. As long as we reject to realise such truths, so uncomfortable to the ego, the white will become black, the *brāh-*

maṇa a *śūdra*, the man a woman, the rich a poor, and so on (or reversed), as results of our own discriminative actions and attitudes. Here, also the hate of a victim to its aggressor is an attitude producing *karma*, as long as we cannot replace it with the forgiveness we have to learn. This is what Buddha will have meant when he said, that we should regard everyone doing harm to us as our teacher, and Jesus when he said: “Father, forgive them, because they don't understand what they are doing”. Not only does karma lead to reversal of the roles as a result of what we did to others, but we will also attract diseases and accidents according to our attitudes and wrong ways of thinking.

Our basic mistake is to believe that we are independent from the rest of the creation and can act without respect to it. The *Sāṃkhya* theory of creation cleanly shows that this is an ignorant attitude. Emerging from one source, we are all part of it and therewith of our environment, of the people and nature around us – and everywhere on earth. Even though we develop individuality, it is an illusion to confuse it with independence. The primary *māyā* arises with the belief that we could emancipate ourselves in the creation. Once fallen into this trap, we have to live it out with all its consequences. For this reason, our consciousness became split in a conscious ego and an unconscious self. The ego goes through this *māyā*, believing itself independent, and the true knowledge of our roles and origin is suppressed to the unconscious self, so that this game becomes possible. Only thus will we act according to our ignorance and darker impulses, no more being conscious of the consequences, so that we can experience the latter and learn the lessons. If we would see clearly, we would not act out what needs correction, and if we keep refusing to change it, the corrective experience would not easily come and we would need long to escape from the wheel of rebirth.

If we would consequently emancipate ourselves from the creation, we would have to stop eating, since our food connects us with nature. This is a slow death. We would also have to stop breathing, since the breath joins us with everything that breathes. This is a fast death. We would actually have to cut ourselves off from the divine flow of life energy in the universe, basic to creation, and that would be the immediate annihilation of our existence, as if we had never been. To enable us to live through our *māyā* of erroneous belief that we could emancipate ourselves in the creation, the knowledge of such basic facts of existence had to become unconscious, making this illusory game possible for the ego.

The royal path to health is, therefore, to realise this and live accordingly. The ultimate remedy is *peace* – not only of the mind but so much more with others and with nature. When this is understood and lived, nothing can disturb the balance, not even the worst impurities. Such a person ultimately becomes a *riṣi* and then no more needs to worry

about precaution's. He is then beyond the possibilities for *doṣa* imbalance and has reached total immunity. The way to reach such peace is a yogic way in love and compassion. We can never avoid acting and therefore never avoid karma. If we try to disassociate with others in order to stay away from conflicts, this is also an action, trying to escape confrontation, and it has its corresponding *karma*. It is by itself a kind of conflict. Since we thus can-

not avoid action, the only solution is to make all actions as positive as possible. The most positive way to act. is 'to always do it out of love and compassion.

"You can see well only with your heart. The essential is invisible to the eyes."

(Antoine de Saint-Exupéry: *The Little Prince*)

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THE CAKRAS IN THE BODY (An Anatomical Study)

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ABSTRACT: Based on the book *Tantra Vidyā* of Oscar Marcel Hinze, the author here interprets the chapter 1.4 of the book and traces the manifestation of *cakras* in the body.

Hinze has in his studies of, a.o., the Tantric philosophy discovered many interesting relationships concerning the *cakras*, such as systematic principles for the *bīja*-mantras and the “peripheral” letters of the petals. A clear evidence by means of the numbers of the petals and structures in planetary motions for the allocation of planets to the corresponding centres in medieval European metaphysics, and also a numerical relationships between certain *cakras* and certain groups of vertebrae in the spinal column (partly relating to suggestions by Woodroffe [4, pp. 103-109] – not to be understood as an attempt to identify *cakras* with groups of vertebrae). As concerns the latter and will be shown in more detail below, he has pointed out that the five lumbar vertebrae relate to the *manipūra cakra* through a structure $5 + 5 = 10$ found in the petal letter arrangement of this *cakra* [2, p. 98] (five dentals and five others, which in their subdivision $2 + 3 = 5$ relate in further detail to a corresponding astronomical phenomenon [2, pp. 71-82 and 3, pp. 58-61]. He has also in detail shown that the number 12 of petals of the *anāhata cakra* relates in its structure of divisions to an astronomical phenomenon, which, again in a structure of divisions, clearly relates to the arrangement of the ribs in the chest and thus to the number 12 of the thoracic vertebrae [2, p. 98]. He therefore assumed that there may be relationships between the two lower *cakras* and vertebrae also, especially since the total number of petals of *mūlādhāra* and *svādhiṣṭhāna*, taken together, is 10, as is also the total number of sacral and coccygeal vertebrae together (see below) [2, pp. 98-99]. However, the conventional anatomical division is into 5 sacral and 5 coccygeal vertebrae, whereas the *cakras* have 6 and 4 petals, respectively. Also, a structure 2×8 (see below) found for the petals of *viśuddha* would at least relate to the 8 cervical spinal nerves, but there are only seven cervical vertebrae defined in the anatomy [2, pp. 99-102]. Independent remarks by Dr. Eric Gomes (Ghent, Belgium) and the present author gave a hint on the solution of the latter problem, and Mr. Hinze asked the present author to study the relationship between *cakras* and vertebrae in detail. As a result, the relations were clarified also for *svādhiṣṭhāna* and *mūlādhāra*, and verified for *viśuddha*. Furthermore, a suggestion by Hinze concerning a relation between the twelve-petalled *dvādaśārṇa cakra* (close to *ājñā*) and the twelve cranial nerves was verified and, in addition, a relation with bones in the skull was found. In the following,

the detailed anatomical proof of relations between the numbers of petals of *cakras* and corresponding groups of vertebrae is given, and some additional results are presented.

The relation between *anāhata* and the twelve thoracic vertebrae is not discussed in much detail in the original article (the chapter in *Tantra Vidyā*) of the author, since it was already given by Hinze in earlier sections of the book. There he shows that the astronomical phenomenon of conjunctions of the sun and the moon has two structures: $7 + 3 + 2 = 12$ and $5 + 5 + 2 = 12$, relating to sure and possible eclipses. He furthermore shows that *anāhata* has a structure $5 + 5 + 2$ of its petal letters: five gutturals, five palatals and two cerebrals, and that the system of ribs in the chest has a structure $7 + 3 + 2 = 12$: seven are joined to the breast bone (sternum), three are not, but are joined to each other, and two are free. Each rib belongs to a corresponding thoracic vertebra, such that those vertebrae can be said to have a structure $7 + 3 + 2$ through their ribs [2, pp. 83-86 and 5, pp. 64-66]. The two subdivisions of 12, i.e. $5 + 5 + 2$ and $7 + 3 + 2$, evolve as different aspects of one and the same astronomical phenomenon, relating to those structures.

Hinze also points out that *m* and *h* in the petal letters *am* and *ah* of *viśuddha* indicate that the sought “eight cervical vertebra” (see below) would be in the skull [2, p. 101], and he, furthermore, brings an explanation for the fact that the $5 + 5$ petals of *manipūra* relate to *five* and not to *ten* vertebrae, in that the corresponding astronomical phenomenon traces two *coincident* pentagrams in the sky (a *double five-pointed* figure and not a *ten-pointed* one), whereas in the case of *svādhiṣṭhāna* a hexagram of two opposite triangles is formed [2, pp. 98, and 3, pp. 57-58, 69-82]. The astronomical phenomenon relating to *viśuddha* has 8 as its primary number, explaining its relation to 8 vertebrae (see below) [2, pp. 98, 87-92 and 3, pp. 66-72]. As concerns connecting the gestalt-astronomical relationships with *cakras* (and the concept of “gestalt-astronomy” by itself), the various editions of Hinze’s book are referred to (a partial translation into English is published in India [3], having only two of the eight sections of the original; it treats gestalt-astronomy on pp. 25-75, but does not have the below article of the present author).

Here it may be mentioned that Hinze in much detail demonstrates exactly an allocation of the Moon to *mūlādhāra*, Mercury to *svādhiṣṭhāna*, Venus to *maṇipūra*, the Sun to *anāhata*, Mars to *viśuddha*, Jupiter to *ājñā* and Saturn to *sahasrāra padma*. A similar allocation of planets to points or regions of the body, which correspond to the locations of the *cakras*, is found in medieval European philosophy. Hinze's work shows that both systems are really identical, expressing the same in different terms.

In the following translation of the German text, some references (in square brackets) have been incorporated, as compared to the original.

Anatomical confirmation of a manifestation of the *cakras* in the body

Oscar Marcel Hinze has demonstrated that there is a specific relation between *anāhata*, the twelve-petalled *cakra* of the archaic “psychic anatomy” in Indian spiritual science [4] and the system of ribs in the chest [2, pp. 83-86, and 3, pp. 64-66p]. This relation shows a detailed correspondence – on one side between the distribution of devanāgarī letters on the *cakra*'s “lotus petals” and the astronomical phenomenon which can be associated with it, and on the other side between the same astronomical phenomenon and the arrangement of the ribs. As a consequence, not only the number twelve of the ribs, but also the number twelve of the thoracic vertebrae, corresponds to the number of petals of this *cakra*. Now, it has been found by Hinze that such a relation between a *cakra* and a set of vertebrae is in a notable way valid for each *cakra*, which is the subject of this study. The aim is to anatomically confirm the validity of such a general relation between *cakras* and vertebrae. In order to show this, we proceed according to the complexity of the confirmation, and not according to the sequence of the *cakras*.

In the following, we denote the individual vertebrae in an anatomical manner as follows:

7 cervical vertebrae:	<i>C1 -C7</i>
12 thoracic vertebrae:	<i>Th1 -Th12</i>
5 lumbar vertebrae:	<i>L1 -L5</i>
5 sacral vertebrae:	<i>S1 -S5</i>
3-5 coccygeal vertebrae:	<i>Cx1 -Cx3 ... 5</i>

(Here, Arabic* numerals are used, instead of the more common notation using roman numerals.)

Maṇipūra*, the ten-petalled *cakra

In this case it is clear that the correspondence along the vertebral column would have to be the five lumbar vertebrae [2, pp. 98, 71-82 and 3, pp. 58-61]. Anatomically, those five vertebrae are clearly defined; their position and their number lead us directly to *maṇipūra*, having a num-

ber of petals which is based on the number five (cf. Introduction) [2, pp. 71-82 and 3, pp. 58-61].

Svādhiṣṭhāna*, the six-petalled *cakra*, and *mūlādhāra*, the four-petalled *cakra

We would here expect a relation between the sacral vertebrae and *svādhiṣṭhāna*, and between the coccygeal vertebrae and *mūlādhāra*. However, the number of the sacral vertebrae is five, and, concerning the coccygeal vertebrae, the anatomy mentions a varying number 3-5 vertebrae [5, p. 286]. The coccygeal vertebrae are mostly more or less rudimentary or fused, and it would not be far-fetched to assume that five would be the original number of those vertebrae, and that the appearances of three or four could be explained by atrophies or fusions. Thus, the total number of sacral and coccygeal vertebrae, together, would actually be ten, and as a natural hypothesis (cf. [2, pp. 98-99], we would like to assign a correspondence with *svādhiṣṭhāna* to the five sacral vertebrae *plus* the first coccygeal vertebra, *Cx1*, and a correspondence with *mūlādhāra* to the other four original coccygeal vertebrae. However, this requires further anatomic evidence, so as not to raise objections of arbitrariness. It can actually be shown that *Cx1* in its anatomical nature rather has the appearance of an unfused sacral vertebra, than of one of the coccygeal vertebrae. It may even occur that this vertebra is, in fact, fused with the sacral bone, and, therefore, forms an actual sixth sacral vertebra in conventional anatomical terms [5, pp. 286-287 and Fig. 279C]. This fusion may in such a case be one-sided, only, or it may occur on both sides [5, p. 286 and Fig. 279A]. In the case when *Cx1* is not fused with the sacral bone, it is the only one of the coccygeal vertebrae which has a transverse process on each side; those processes correspond to the “scutiformally” fused transverse processes of sacral vertebrae in the lateral parts of the sacral bone [5, pp. 287, Figs. 271-272 and pp. 421-422]. Furthermore, this vertebra has two “horns” pointing upwards (coccygeal cornua), which correspond to the fused articular processes of the sacral vertebrae (forming parts of the intermediate sacral crest) [5, p. 120]. Those “horns” often articulate against corresponding “horns” (sacral cornua) on *S5* [5, p. 120]. The other coccygeal vertebrae lack such appearances.

As further concerns the number of the coccygeal vertebrae, a possible divisibility into five parts is not easily recognisable in such cases, but in which only three or four separable bones are formed. It can then, however, be assumed that a *Cx5* and, in applicable cases, also a *Cx4*, has regressed into disappearance. Occasionally, an existing *Cx5* is, actually, as small as if almost disappearing [5, Fig. 422]. But it could also be that two or three coccygeal vertebrae have fused to form one single bone [5, Figs. 271-272]. One may in any case take the maximum number of five as an indication of an original or basic number, especially since the occurrence of this number is not as rare as to be taken for an anomaly. A modern encyclopaedia, furthermore, states that the coccygeal bone “arises from fusion of the five last, incompletely formed, vertebrae, which follow after the sacral bone” [6].

* Commonly, our numerals are called “Arabic” in the West, even though their origin is Indian (passed on to the West through the Arabs in ancient times). (Note added in the translation).

Hence, the number of vertebrae which correspond to *svādhiṣṭhāna* has the structure $5 + 1 = 6$. A correspondence to the *devanāgarī* letters of the *cakra* would be, one aspirated sound (*bha*) and five unaspirated (*ba, ma, ya, ra, la*) (cf. [4]).

Furthermore, there is inside *svādhiṣṭhāna* also a twice appearing eight-petalled lotus [4, p. 365]. This could be related to the eight quite notable sacral foramina, inside the sacrum, which are formed by the fused transverse processes and are arranged as a row of four holes each on either side of the intermediate sacral crest [4, p. 282 and Fig. 266].

Viśuddha, the sixteen-petalled cakra

The structure of the petals is here $8 \times 2^*$ and the location leads us to the cervical vertebrae. However, the anatomy describes only seven cervical vertebrae. Can an eighth be found?

An indirect indication of an eighth cervical vertebra is given by Bohm: "Goethe assumed an inflated and inverted dorsal vertebra in the head" [7, p. 55]. Apparently, Bohm has not recognized the deeper implications of this (he nowhere mentions relations between *cakras* and numbers of vertebrae). A closer study of Goethe's *Naturwissenschaftliche Schriften* (Treatises on Natural Science) shows, however, that he didn't see the origin of the cranium in one single vertebra, but first in three and later on in six vertebrae [8, pp. L-L1, 271, 316, 318-319, 322 and 9, pp. 33 ff.]. The primary indication thereof is found in 1786 in the works of Goethe (in his treatise on the "intermediate bone") [8, p. 316]. In 1807, a similar theory was published by Lorenz Oken, Professor in Jena [8, p. 322]. In the modern comparative history of animal development, this "Goethe-Oken's theory of the skull" has been taken up anew [10, pp. 394-401]. A vertebral origin of the occipital region of the cranium can be shown by means of general comparison of relations in the zoological evolution [10, p. 394].

A fossil fish, *Eustenopteron* (a Crossopterygean) even gives a double indication of a vertebral origin of the base of the skull [10, p. 399].

The embryological development of man also indicates a vertebral origin of this part of the skull. The vertebral column is formed by the dorsal cord (*chorda dorsalis* or *notochorda*), which then completely disappears [5, pp. 103 and 135-140]. This chord continues in the embryonic form of the base of the skull, up to the hypophysis [5, pp. 138-139 and Fig. 119]. Furthermore, the following parts of the skull – like the vertebrae – are of a cartilaginous origin (the other parts originate from connective tissue): the oc-

cipital bone (except the squamous part), the petrous part of the two temporal bones, the lesser wings and the roots of the two greater wings of the sphenoidal bone, as well as the ethmoidal bone [5, pp. 140, 351, 356-357, 362-364 and 372]. The squamous part of the occipital bone is sometimes separated as an individual bone (the interparietal bone) [5, p. 351].

Thus, we may regard as confirmed that the basis of the skull may, on an evolutionary basis, be viewed as an eighth cervical vertebra (below, we will denote it by C0; actually, C0 is the first, C1 the second and C7 the eighth cervical vertebra). This shows the relation between *cakras* and vertebrae, hinted on by Hinze, to be valid for *viśuddha* as well.

As a summary, we thus have the following correspondences:

eight	C0-C7	<i>viśuddha</i>	(2×8-petalled)
twelve	Th1-Th12	<i>anāhata</i>	(12-petalled)
five	L1-L5	<i>maṇipūra</i>	(2×5-petalled)
six	S1-S5 + Cx1	<i>svādhiṣṭhāna</i>	(6-petalled)
four	Cx2-Cx5	<i>mūlādhāra</i>	(4-petalled)

The special position of C0 has a correspondence in the letters of *viśuddha*. The corresponding letters in the circle of petals are special letters in the *devanāgarī* (*aṁ* and *aḥ* – here rather *aṁṁ* and *aḥṁ*) [2, Fig 10; 3, Fig. 9; 4, plate VII at p. 391 and 7, Fig. at p. 84], which also reflect the *bīja*-sounds (*ṁ* and *ḥ*) of the two *cakras* in the head [11].

The confirmed relations are, of course, not to be taken for an identification of such groups of vertebrae with their corresponding *cakras*. They merely indicate that the *cakras*, among other things in the structures of the body, also manifest in groups of vertebrae.

Concerning the view of Goethe that the skull would develop out of several vertebrae, it may be remarked that a vertebra itself usually develops put of several bony parts, which then fuse to form an unseparable unit [5, pp. 278-280 and Figs. 273-278]. The presence of several bony parts in the base of the skull can, therefore, still be associated with a single vertebra. Goethe assumed individual vertebral origins for six different bones of the skull. Three of those belong to the bones of the face, which neither develop from cartilaginous tissue nor from the dorsal chord. The other three are parts of the base of the skull, here – for reasons given – viewed as originating as a whole from *one* vertebra*.

Discussion of the bones of the skull

Among the bones of the face (the facial cranium), the ethmoidal bone and the inferior nasal conchae are often also mentioned [12., Vol. 1, p. 260]. As we have seen, however, the ethmoidal bone in its entirety develops out of cartilaginous tissue and, therefore, belongs to the base

* This shown by Hinze, a. o. by, means of the astronomical phenomenon which can be related to *viśuddha*, and also through the *pairing* of the petal vowels: *a* and *ā*, *i* and *ī*, *u* and *ū*, etc. (Note added in the translation).

* The three last sentences here differ somewhat from the original German text, in which the bones are listed in Goethe's terminology.

of the skull, or to the “eighth” (or, rather: first) “cervical vertebra”. One also finds that the two inferior nasal conchae develop out of cartilaginous tissue as well, and this in the form of ossifications of the nasal cartilage [5, p. 373]. We can, therefore, either refer those bones to the base of the skull (which was not done above, in accord with *Gray's Anatomy* [5], or, alternatively, view them separately as mere such ossifications of that cartilage. Then twelve facial bones remain, which do not develop from cartilage, but from connective tissue. Of these, five are paired and two are singular. Those bones are: the nasal bones, the lacrimal bones, the zygomatic bones, the palatine bones and the maxillae (paired bones), as well as the vomer and the mandible (singular bones). Hence, we here find a structure $2 \times 5 + 2 = 12$, as we already did for *anāhata*. Another expression of the fundamental 12-parted structure was found for the ribs (cf. the introduction). Now, a small twelve-petalled secondary *cakra* in the head is also mentioned; *dvādaśārṇa* [4, pp. 128, 482-500; and 2, pp. 93-96 and 5, pp. 72-75], whose related main *cakra*, *ājñā*, may be regarded as a repetition of *anāhata* [2 and 3, Ch. I]. What is remarkable here, is, that even the bone structure repeats an arrangement in twelve! It may, therefore, be proper to regard the facial bones as corresponding to the region of *ājñā*. A correspondence to *ājñā* alone could then, logically, be the two inferior nasal conchae, even though this is not quite as obvious as for the other correspondences discussed above.).

The other cranial bones, which also develop from connective tissue, form the roof of the skull, the calvaria [5, p. 303]. Those are the frontal bone, parts of the occipital bone and the sphenoidal bone (singular bones), as well as the parietal bones and parts of the temporal bones (paired bones). (The other parts of the bones mentioned but here not fully included bones belong to the base of the skull, as shown above.) The numbers of those bones are $2 \times 2 + 3 = 7$. A possibility to connect *sahasrāra padma* with those bones could at first appear to be the fact that this *cakra* is the seventh, which cannot be taken for an obvious correspondence. However, *sahasrāra padma* is also a kind of totality of all *cakras* [2, p. 44; 3, p. 33; 4, p. 164 and 7, p. 119], which can be represented by the formula $4 + 3 = 7$ (four “material” *cakras* of the trunk and three “superior” *cakras* of the neck and head*). This seems to sustain the correspondence hinted on, even though it should still be taken as somewhat hypothetical.

The other bones which are associated with the head, the hyoid bone and the extremely small bones in the ear, cannot here be truly referred to the actual skull. (The hyoid bone may rather be regarded as an ossification of a tracheal cartilage, and hence belongs to the trachea, and the

little bones in the ear as ossifications in the auditory organ).

Discussion of the repetition of 12-parted structures

We have seen that the 12-parted structure for *anāhata* is repeated for the facial bones according to the formula $2 \times 5 + 2 = 12$. If we study the complex of the sacral bone, we again find the same 12-parted structure! At each of the five anatomical sacral vertebrae, we have two “ribs” (costae) fused with each other, as well as with their vertebrae, which build up the “shield” of the sacral bone [5, pp. 282-283]. We have, furthermore, seen that the first coccygeal bone is to be regarded as a separate sixth sacral vertebra, which also has two ribs, which are fused with the vertebra but otherwise usually separate. Thus, we again find the formula $2 \times 5 + 2 = 12$: two rows of five fused ribs and two separate ribs.

Now, the six *cakras* below *sahasrāra padma* are paired in three groups [2, p. 45 and 3, p. 34], and we find that the 12-parted structures can be associated with those groups*. As a summary:

(5+5)+2 facial bones:	group III (<i>ājñā</i> , <i>viśuddha</i>),
twice (7+3)+2 thoracic ribs:	group II (<i>anāhata</i> , <i>maṇipūra</i>),
(5+5) + 2 sacral “ribs”:	group I (<i>svādhiṣṭhāna</i> , <i>mūlādhāra</i>).

Neuroanatomical discussion

The spinal nerves, which pass through the vertebral column and form the proximal part of the peripheral nervous system* are [12, p. 121]:

8 cervical nerves,	<i>NC1-NC8</i> ,
12 thoracic nerves,	<i>NTh1-NTh12</i> ,
5 lumbar nerves,	<i>NL1-NL5</i> ,
5 sacral nerves,	<i>NS1-NS5</i> ,
1 coccygeal nerve,	<i>NCx1</i> .

in which, according to the above, the last six nerves should obviously be taken together.

A spinal nerve leaves the spinal channel below its corresponding vertebra. The first cervical nerve, however, leaves below the base of the skull. The number eight of the cervical nerves already hints on the question of an eighth cervical vertebra and the position of *NC1* on its location [11]. The neurology again confirms the finding that the base of the skull is to be regarded as an eighth (or, rather: first) cervical vertebra.

At the lower end of the vertebral column, there are two peripheral nervous plexuses: the sacral plexus [12, Vol. 3, p. 137] and the coccygeal plexus [12 Vol. 3, p. 143]. Of those, the sacral plexus is mainly formed by *NS1-NS5* and *NCx1*, but also by *NL4-NL5* [12]. The coccygeal plexus is also formed

* This is a cosmologically feasible division relating the four “material” *cakras* to the grossly material world and the others to higher cosmological levels (including *ākāśa*). Another division is in five “lower” *cakras*, relating to the five elements, and, consequently, in two “higher” *cakras*. However, *ākāśa* has a special position among the elements. (Note added in the translation.)

* As concerns the relation between the subdivisions $5 + 5 + 2$ and $7 + 3 + 2$, see the introduction. (Note added in the translation.)

by NS1-NS5 and NCx1 [12]*. This constitutes further evidence that Cx1 really belongs to the group of sacral vertebrae. Another evidence is found in that the spinal medulla, including its terminal filament (filum terminale), passes on down to Cx1. Cx2 is the first vertebra without even a terminal filament [5, p. 983 and Fig. 793]**.

It is, furthermore, of interest that also the twelve paired cranial nerves belong to the peripheral nervous system [12, Vol. 3, p. 146]. A correspondence to *dvādaśārṇa* and the twelve facial bones appears as a natural consequence.

Can cakras be identified with physical structures?

Due to the herewith demonstrated clear correspondences between *cakras* and groups of vertebrae and also groups of spinal nerves, one might be tempted to identify *cakras* with anatomical structures. This has also been tried (a.o., by B.K. Sarkar and B. Seal [4, pp. 153-158], and identifications with nervous plexuses have been suggested. Woodroff (=Avalon), however, clearly states [4, pp. 158-164] that, according to the Indian doctrine, the *cakras* are not located in the gross body (*sthūla śarīra*), but only have certain relations to it. According to this doctrine, a subtle body (*sūkṣma śarīra*) is superordinate to the gross body, and *cakras* are located to this subtle body. Woodroff remarks: “to connect or correlate and to identify are different things” [4; p. 161].

From Indian scriptures on the subject, we can only deduce that any attempt to identify *cakras* with structures of the gross body constitutes a limitation of the view or a projection of a subtle reality on to a gross physical level (a view usually forced about by the fact that Western science limits itself to accept only the latter as existent)***.

Mathematical note

The petal numbers of the five *cakras* form a “bi-arithmetical” series with a periodically changing difference of two and four, respectively. The petal numbers of a *cakra n* (numbered 1-5 from below) can for those five be expressed as

$$B_n = \sum_{i=1}^n [3 - (-1)^i]$$

The three upper *cakras* (here including *dvādaśārṇa* as a separate *cakra*, since we have found it to play a certain role above) form a kind of power sequence, which, however, is a little complicated. If we number them by *m* = 1

for *ājñā*, *m* = 2 for *dvādaśārṇa* and *m* = 3 for *sahasrāra padma*, the petal number is

$$B_m = 2^n(2m - 1)^{2m-3}.$$

Those relations are here mainly of mathematical interest, since philosophical or other consequences are, so far, hard to see, but the fact that such relations are found appears worth mentioning.

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* In the 35th edition of *Gray's Anatomy*, the sacral plexus is described as formed by NL4, NL5 and NS1-4 (pp. 1054-1055 and the coccygeal plexus as formed by NS4, NS5 and NCx1 (p.1061). (Note added in the translation.)

** The mere fact that Cx1 is the only coccygeal vertebra with an associated nerve already separates it from Cx2-5 and puts it in a class like that of the sacral vertebrae. (Note added in the translation.)

*** This sentence differs from the German original, which instead refers to other sections in Hinze's book.

AN ALTERNATIVE TO THE ARTIFICIAL KIDNEY AND AN ANCIENT PROCEDURE OF *KRIYĀ YOGA**

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ABSTRACT: The ancient procedure of *Kriyā yoga* is compared here to Dr. Tse-kong Young's modern alternative to the artificial kidney. Both methods are basically the same and the treatment costs almost nothing.

Too little has been done to investigate possible alternatives to the treatment with the kidney machine, for the following reasons:

1. The patients depending on the kidney machine for their lives are in a vulnerable situation, needing a continuous access to, and supply of, means of advanced technology. In case of catastrophe, war, crisis etc., such supply may be reduced, or even locally cut off, for a time long enough to let most of them die—unless alternative non-technological approaches are developed for use as emergency treatment,
2. the kidney machine is a privilege of the rich countries, being much too expensive for wider use in the so called “third world”. Alternative treatments of a non-technological nature may, however, be very much suitable there, due to vastly less costs.

One such alternative is developed by Dr. Tse-kong Young, national Defence Medical Centre, Taipei, Taiwan, Republic of China. The work is sponsored by NIH, USA.

If a hypertonic saline solution is drunk, it will become absorbed only in minor quantities in the intestines. It may even osmotically extract fluid, at least locally. Thus it is passed “through the alimentary canal and, if taken in sufficient quantities, causes a “water diarrhoea”. If the intake continues, eventually a clear solution is expelled through the rectum. Large quantities can be passed this way. Just like in the artificial kidney of the dialyser type, this solution takes up waste substances from the blood, which diffuse through the intestinal wall. The “membrane” here is the intestinal mucosa, with a very high surface area. As a result, “water diarrhoea” turns out to be a practicable way to replace the kidney function. It needs no special equipment, but only water, salt, some additives and a certain patience a few times a week.

The solution used by Dr. Young has, in mEq/litre: 48-60 sodium, 4 potassium, 2 calcium, 40-46 chloride, 14-20 bicarbonate, plus 180-220 mmols/litre mannitol. It is administered orally in quantities of about 200 ml every 5

minutes, for about 3 hours, i. e., a total quantity of about 7 litres is passed. The treatment is usually done at home 3 times a week. Diarrhoea starts about 45 minutes after beginning the treatment and ends about 25 minutes after it is finished. Typical clearance values are about 27 ml/min for urea and 7 ml/min for creatinine; considerably lower than for the artificial kidney, but obviously sufficient for the patients treated. Dr. Young keeps quite a number of his patients well alive and active, this way, by means of the gastrointestinal dialysis thus described, which offers a cheap and practicable alternative—not only for the so called “development countries, but also as emergency treatment for dialysis patients, somehow cut off from the artificial kidney. Other alternative non-technological methods can also be thought of, but time does not allow to discuss them here.

Now, the method described will be familiar to most Indian listeners, acquainted with the ancient method of *śaṅkha prakṣāḷana* – also called *vārisāra dhauti*. I have made no own work on the gastrointestinal dialysis mentioned. My only contribution is to discover this hitherto unnoticed close relation between a method developed in modern medicine and a *Kriyā Yoga* procedure known for some 3000 years, or more. This discovery, however, throws new light on the somatic effects of *śaṅkha prakṣāḷana*. Not only is the effect of the latter the cleansing of the intestines, but also of the blood, and therefore generally of the body—apart from the effects it may have on the *sūkṣma śarīra*.

In *Gheraṇḍa Saṃhitā* 1;17-19, written in ancient India, this method was already described: “Fill your mouth with water and drink it slowly. Move it in the bowel and force it out through the rectum. *Vārisāra* is to be kept strictly secret. It cleanses the body and through its practice, one attains a healthy body.”

In a modern text book on Yoga, *Āsana, Prāṇayāma, Mudrā, Bandha* by Svāmi Satyānanda Sarasvatī, we read: “*Vārisāra dhauti* or *śaṅkha prakṣāḷana*:.... A clean

* Lecture given at the 1st conference on the Role of *Āyurveda* and Traditional Medicine in Primary Health Care, Vārāṇasī (Benares), March 1980.

bucket... should be filled with lukewarm water. Some salt must be added... just enough so that the water tastes salty... Drink 2 glasses... as quickly as you are able. Then perform the following 5 *āsanas* 8 times each: 2 varieties of *tāḍāsana*... *kaṭi cakrāsana* ... *tiryak bhujangāsana* ... *udara karṣaṇa āsana*.” This is repeated. One goes to the toilet and then repeats drinking and *āsanas* – and so on. This is continued until after some 15-30 glasses only clean water is expelled through the rectum. Afterwards, one rests for about an hour and then eats some rice with ghee. I have myself performed this effectively and experienced it as well practicable.

As a conclusion, Dr. Young's modern alternative to the artificial kidney has been briefly described and compared

to an ancient procedure of *Kriyā Yoga*, which must have been known for some 3000 years. Basically, both methods are the same. The measurable effects published by Dr. Young et al. throw new light on the somatic effects of this *Kriyā Yoga* exercise. In comparison with the kidney machine, the treatment costs almost nothing.

The same method, in principle, has also been used successfully in cases of cholera, with the purpose of continuously supplying the bowels from above with liquid to be expelled, so that this has not to be extracted from the body fluids in greater amounts, preventing dehydration and demineralization.

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TRANSLATIONS INTO WESTERN LANGUAGES OF ANCIENT WORKS ON ĀYURVEDA

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ABSTRACT: This contribution lists all translations into Western languages of ancient works on *Āyurveda*, found by the author through searches in various university libraries and other sources.

Access to ancient works on *Āyurveda* is of a basic importance for the study of this important science. However, persons in the West interested in *Āyurveda* often have limited knowledge of Sanskrit and therefore cannot easily make use of literature in the original language. For those, the availability of earlier scriptures in translation is of a high degree of importance. While building up a personal library on *Āyurveda*, the author has therefore made it to a task to find every available translation of ancient works. The search herefore has brought about a rather complete (as the author believes) collection of such translations. In the interest to Western readers, those are listed below, mainly in the order of importance. Where no other language is given, the translation is into English. Most works out of print can be found in German university libraries, for example, and it is often worthwhile to have them copied (which is allowed for works out of print and can often be done at quite a reasonable cost).

This listing was originally made up to follow a short preface to book Nr. 17 in the list, and is here somewhat completed (with a few shorter extracts in Journals, not included in the original listing).

Another interesting work should be mentioned, which is, however, not included in the list, due to lack of information on whether it is compiled from ancient sources or a personal work by the author (or translator?), and in the former case which the sources are. It is named *Rasajalanidhiḥ* and was published privately in Calcutta by Bhūdeva Mukhopādhyāya. The preface to the first volume states the intention to issue 10 volumes, however, the author has found only five, published 1926, 1927, 1929, 1936 and 1938.

The author would greatly appreciate receiving information on further translations, not included in the list below.

According to common practice, the title has been set in italics for monographs (books) but not for articles in Journals, in which case, instead, the name of the Journal has been set in italics.

Books Nr. 12 and 28 are comparative translations based also on the Tibetan versions of the text (translated into Tibetan in ancient times).

Ancient scriptures on Āyurveda, translated into Western languages*

1. Caraka Samhitā, Sūtrasthāna 1-3, translated by M. L. Sircar, *Calcutta Journal of Medicine*, Vol. III, 1870, pp. 449-480 and Vol. 10, 1871, pp. 33-41 and 155-162.
2. *Caraka Samhitā*, private publication by A. Chandra Kaviratna and P. Sharma, Calcutta, in 68 fasciculi 1890-1925.
3. *Caraka Samhitā*, Shri Gulabkunverba Ayurvedic Society, Jamnagar (Gujarat), 1949. (Translations into English, Hindi and Gujarati.)
4. *Caraka Samhitā*, translated by R. K. Sharma and Bhagwan Dash, Chowkhamba Sanskrit Series Office, Varanasi, Vol. 1: 1976, Vol. 2: 1977. Unfinished.
5. *Caraka Samhitā*, translated by P. V. Sharma, Chowkhamba Orientalia, Varanasi, Vol. 1: 1981. To be continued.
6. *Suśruta Samhitā*, translated into Latin by F. Hessler, Enke (publisher), Erlangen (Germany), Vol. 1: 1844, Vol. 2: 1847, Vol. 3: 1850.
7. *Suśruta Samhitā*, Sūtrasthāna 1-46, translated by U. Ch. Dutt and A. Chattopadhyaya, Asiatic Society of Bengal, Calcutta, fasc. 1-2: 1883, fasc. 3: 1891. Unfinished.
8. *Suśruta Samhitā*, Sūtrasthāna 1-54, translated by A. F. R. Hoernle, Asiatic Society of Bengal, Calcutta, 1897. Unfinished.
9. *Suśruta Samhitā*, translated and published by K. L. Bhishagratna, Calcutta, Vol. 1: 1907, Vol. 2: 1911, Vol. 3: 1916. Reprint: Chowkhamba Sanskrit Series Office, Varanasi, 1963.
10. *Suśruta Samhitā*, published by G. D. Singhal, Singhal Publications, Varanasi, Vol. 1: 1981, Vol. 2: 1982, Vol. 3: 1972, Vol. 4: 1973, Vol. 5: 1982, Vol. 6: 1979, Vols. 7-8: 1976, Vol. 9: 1980, Vols. 10-12 in preparation. ("Ancient Indian Surgery Series".)
11. *Aṣṭāṅgahṛdayasaṃhitā of Vāgbhaṭa*, translated into German by L. Hilgenberg and W. Kirfel. E. J. Brill (publisher), Leiden (The Netherlands), 1941.
12. *Aṣṭāṅgahṛdayasaṃhitā of Vāgbhaṭa*, Chapters 1-5, translated by C. Vogel, Franz Steiner (Publisher), Wiesbaden (W. Germany), 1965.
13. *Aṣṭāṅgahṛdayasaṃhitā of Vāgbhaṭa*, a few chapters only, *Bulletin of the Department of History of Medicine*, Osmania Medical College, Hyderabad, Vol. 2, 1964. pp. 67-76 and 141-158.
14. *Aṣṭāṅgahṛdayasaṃhitā of Vāgbhaṭa*, Sūtrasthāna 22, 23 and 38, *Bulletin of the Department of History of Medicine*, Osmania Medical College, Hyderabad, Vol. 1, 1963, pp. 199-218, and Vol. 2, 1964, pp. 1-13.
15. *Mādhavanidāna*, Chapters 1-5, translated into Italian by M. Vallauri, *Giornale della Società Asiatica Italiana*, Florence (Italy), Vol. 26, 1915, pp. 253-290.
16. *Mādhavanidāna*, Chapters 1-10, translated and commented by C. J. Meulenbeld, E. J. Brill (publisher), Leiden (The Netherlands), 1974.
17. *Mādhavanidāna*, published by G. D. Singhal, Singhal Publications, Varanasi, in print (due 1985).
18. *Bhāvaprakāśa of Bhāvamiśra*, only sections on ophthalmology, translated into German by E. Esser, Part 1: *Studien zur Geschichte der Medizin*, Separatum, Barth (publisher) Leipzig, Vol. 19, 1930; Part 2: *Sudhoffs Archiv für Geschichte der Medizin*, Vol. 25, 1932; pp. 183-213; addenda in *Klinische Monatsblätter für Augenheilkunde*, Vol. 86, 1931, pp. 245-246, and Vol. 90, 1933, pp. 85-87.
19. *Bhela (Bheḍa) Samhitā*, Sūtrasthāna 16, translated into French, in: J. Filliozat: *La doctrine classique de la médecine indienne*, Imprimerie Nationale, Paris (France), 1949, pp. 170-173 (English translation: *The classical doctrine of Indian medicine*, N. Delhi, 1964).
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22. *Hārīta Samhitā*, Prathamasthānam, translated into French by A. Raison French Institute of Indology, Pondicherry, 1974.

* Where no other language is given, the translation is into English.

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25. *Yogaśataka*, translated into French by J. Filiozat, French Institute of Indology Pondicherry, 1979.
26. *Āyurveda Saukhyam of Toḍarānanda*, translated by Bhagwan Dash and L. Kashyap, Concept Publishing Co., N. Delhi, Vol. 1-2: 1980, to be continued.
27. *Āyurveda Saukhyam of Toḍarānanda*, a few short extracts, *Bulletin of the Department of History of Medicine*, Osmania Medical College, Hyderabad, Vol. 3, 1965, pp. 151-160 and 210-219.
28. *Siddhasāra of Ravigupta*, translated by R. E. Emmerich, Franz Steiner (Publisher), Wiesbaden (W. Germany), Vol. 1 (Sanskrit text only): 1982, Vol. 2: (Tibetan text with English translation): 1983.
29. The Bower Manuscript, including the Nāvanītaka, preliminary translation by A. F. R. Hoernle, *Journal of the Asiatic Society of Bengal*, Vol. 60, pp. 174-195. (1891)
30. *The Bower Manuscript*, including the Nāvanītaka, final translation by A.F.R. Hoernle, Office of the Superintendent of Government Printing, Calcutta, 1893-1909 (Series “Archeological Survey of India”, New Imperial Series, Vol. 22).
31. *Rasārṇavakalpa*, translated by Mira Roy and B. V. Subbarayappa, Indian National Science Academy, N. Delhi, 1976.
32. *An eight-hundred year old book of Indian medicine*, translated by E. Sharpe, Luzac & Co., London (England), 1937. Reprint: Asian Educational Services, N. Delhi, 1979.
33. *Rājanighaṇṭu Varga of Narahari*, Part 13, on minerals, also mentioning medical properties, translated into German by R. Garbe (*Die indischen Mineralien, ihre Namen und die ihnen zugeschriebenen Kräfte*), S. Hitzel, Leipzig (Germany), 1882. Reprint: Verlag Gerstenberg, Hildesheim (W. Germany), 1974.
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