

# MAN AS EMBRYO BETWEEN HEAVEN AND EARTH

## DYNAMIC MORPHOLOGY IN THE DEVELOPMENT OF HUMAN POSTURE

Jaap van der Wal, M.D., PhD.

Lecture notes applied for the First International Working Conference on  
Anthroposophical Physiotherapy, Goetheanum, Dornach, Switzerland, 2. and 3. Mai  
1997

These lectures notes are revised editions of the English abstracts in: *Bausteine einer anthroposophischen Physiotherapie 1, Dynamische Morphologie und Entwicklung der menschlichen Gestalt* by Jaap van der Wal, Michale Glöckler u.a., published by the Medizinische Sektion der Freien Hochschule für Geisteswissenschaft am Goetheanum, CH-4143 Dornach, 1999. Second revised edition, 2003, ISBN 3-7235-1183-X

The author himself edited and revised the summaries. The conference itself was bilingual (German and English). Therefore the German quotes are preserved in the text and translated and sometimes the German expressions are given in brackets and in italic.

The author wishes to thank *Mr. Michael Shea PhD* for his extensive effort in reading these lecture notes and editing them thoroughly and precisely. He gave me a lot of remarks, comments and grammatical suggestions that I gratefully accepted.

Address of the author: J.C. van der Wal, MD PhD, Embryo in Motion, P.O. Box 1157, NL-6201 BD Maastricht, Holland. Email: walembryo@home.uni-one.nl. Website: [www.embryo.nl](http://www.embryo.nl).

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the author.

## SUMMARY OF THE LECTURES – INTRODUCTION

- In human embryonic development we deal with a process of *functioning in forms*. This means that in this phase of human existence the (growing and metamorphosing) forms and structures of the body and their functioning are still *unified*. The gestures of growth, shaping and development may be interpreted as human behavior and understood as a *pre-exercising* of physiological and psychological functions of the human organism, which later on in life are gradually realized (so to speak) into body structures.
- Starting from the *point oriented* dimension of the **first** week of development via a phase of existing in two-dimensional proportions (second week of human development), the human embryo shapes itself into a three-dimensional inner space by a process of delamination and folding (third to fourth week). By this process the inside organization is mirrored by the organization of the embryonic exterior organization, i.e. its *outer or peripheral body* represented by the fetal membranes (placenta).
- Next the human embryo emancipates itself from this stage of folding and bending (which could be described as animal' or 'astral' phase according to Rudolph Steiner) by means of a gesture of uprightness (retroflexion) of the body stretching and lengthening. This results in a polarity between head region and pelvic region with the trunk as a space creating dimension in between. This organization with the related arrangement of head and pelvis on top of each other is a necessary condition for the postnatal erect posture of man.
- The four phases of human embryonic development can be characterized as follows:

Mineral	- point and circle	- growing (multiplying or accruing)
Plant	- center and periphery	- growing out
Animal	- inside (inner) and outside (outer)	- growing in
Man	- above (upper) and below (lower)	- growing beyond
- During this development of becoming erect the shoulder girdle and pelvic girdle achieve a polarizing relationship. So do the arms and legs. This polarity is fully recognizable in the functional anatomy, posture and behavior of the adult. A striking feature in this respect is the essential difference between the two girdles and extremities, which for example is represented by their opposite rotations during growth. It is this polarity which is lost by the (higher) animal but which is maintained by the human during his whole life and development. This represents an important phenomenon of *retardation (restraint against animal specialization)*. Human evolution is therefore to be understood as a gesture of spiritually standing up, but even better as a spiritual effort to stay upright and to maintain the upright position. It is the principal of *retardation* that marks the essential human development and enables the **spiritual** development of man.
- From the aforementioned gesture(s) of unfolding upright and development, it may be understood that the spatial organization of the trunk and extremities can be seen **as** a metamorphosis or *turning inside out* of the organization of the head and reverse. The human figure (shape) on the one hand may be interpreted as an empathetic balance between *introverted antipathy* and *extraverted sympathy*, between head and extremities, and on the other hand between *above* and *beneath* in which the vertebral column appears as the *erecting and balancing* middle dimension. The arms and legs fit well within this polarity. On the other hand, they seem to transcend it by their opposite dynamics of growth and shaping. In this way the stature is formed of a being that can mediate between heaven and earth.



## CHAPTER I (lecture I) <sup>1</sup>

### Introduction and Method. In the beginning – about Heaven and Earth

#### THEORY OR PRACTICE

In this conference the morning lectures are meant to deal with theory, while the afternoon sessions are more practical, to exchange approaches, techniques, and also ideas and experiences. I am convinced in the theories, concepts and models in peoples careers that the paradigm or image of man and nature of those people is implied and sometimes very explicit. Whatever you do as a therapist or a practitioner, your work is framed by your image and beliefs about man and nature. How you practice, is determined by *how you think*. If we only focus on the practical applications of e.g. anthroposophy, we risk developing an alternative practice without the related and necessary change of mind. The mission to generate new concepts of man and nature is as important as discovering new practices and approaches in the field of physiotherapy. Working in the field of the ethics of genetic engineering I discovered that the future of our society will be destined much more by our ideas and our thinking than by our therapeutic practice. Therefore: the best practice is still a good theory. Don't think that these lectures are secondary to the reality of practice and workshops. Change of mind is equally important. Remember the old prophesy of John the Baptist: *Metanoieite* (Greek for "Change your mind"). Nowadays we do not need new horizons, but new eyes.

#### PARTICIPATOR OR ONLOOKER?

The phenomenological approach requires that you take your sensory experience seriously. "Take for truth what you perceive" („Halten Sie für wahr was Sie wahrnehmen (wahr = true)). Be faithful to your experience and to how the world, how reality is revealed to you when you participate in it. Do not let the reality of the outside onlooker prevail. In these lectures we will deal with a participatory embryology and morphology. What we are looking for, is not the cause of things but for their meaning as revealed by one's perception. We are looking for gestures and for images. What is reality? For example, how much do you weigh? Is it the inevitable 60 or 70 kilos on the scale or is it weight as you experience it? How heavy is the dead person, the disabled patient, the sleeping child, how light the dancing, the happy, the beloved one? Not only gravitation, but also *levitation* belongs to the reality of the participating observer, of the experienter. Modern materialistic philosophy expels the human factor. Remember that only the *anthropocentric*, earth-bound or earth-participating point of view reveals the reality of a rising or setting sun, of moving planets in interaction with each other and with the stars. Nowhere else in the universe and by no one else can that standpoint be found regarding the reality of those observations, than by the individual human being itself.

#### EMBRYOLOGY AND DYNAMIC MORPHOLOGY

What I will try to elucidate in this presentation are the gestures (*Gestik*) that are working behind the forms of the extremities and the related girdles. If we discover the processes that have led to the form, this might help us to understand the principles of form and function of our shoulder and pelvic girdles. If we find and understand the gestures, we will *see* the *images* through or behind the gestures. We may reach the domain of the "supersensible" (Sinnlich-Übersinnliche, Goethe) or: "The archetypical images represent creative beings and principles" (Rudolf Steiner, Theosophy). We might, no more and no less, encounter the BEING that manifests through forms and gestures! As stated before, the embryo is not the aim of these lectures; it is a mean to gain insight into the dynamic morphology of man. I am aware that there exist other approaches to achieving this. I choose the embryo because it is a *law* that "All beings may only be understood from their becoming" (Ernst Haeckel) and: "Man is a shape that has come forth out of motion" ("Der Mensch ist eine Form, die aus der Bewegung hervorgegangen ist, Rudolf Steiner).

The most important method I will apply will be that of Polarizing and Contrasting. In spite of what people believe, thinking in polarities does not lead to dualism, but to *monistic* or *supra-dualistic* understanding. In studying polar relationships, coherence will be revealed. For that purpose one always has to deal with context. I will mainly apply the lemiscatroscope, an *instrument* that is very

---

<sup>1</sup> The German quotes are a.o. derived from *Dynamische Morphologie* by O.J. Hartmann, Verlag Vittorio Klostermann, Frankfurt/Main, second edition, 1959.

much related to the microscope. It is always good to realize the advice of Goethe to consider details in a given context and to be aware which lens and which point of view is applied.

## FERTILIZATION

“In the beginning God created the heavens and the earth.” I have never encountered a more powerful image of those mighty words of creation than the *preconception attraction complex*. This is the image of a dynamic balance that exists for some hours between the two enormous polarities of an egg cell and a spermatozoa. They contain two polar qualities or dimensions in a creative balance of encounter and meeting. They are the dimensions of center and periphery, of radius and circle, of concentration and expansion, of nucleus and cytoplasm, of form and process, of open and closed, and so on. Yes indeed: of *heaven and earth*. We deal with the most essential polarity we may experience: here and there, Me and The world. There in those few hours the normal dimensions of biology are turned inside out, a kind of *de-biologicalisation* takes place: biological matter is opened, reversed for opposite dimensions of spirit. Conception is not a mixing of two qualities, it is *Steigerung* (German for raising, which means: synergy or functional elevation). There *at that one moment of encounter* matter fires out and spirit flames in. This is another example of the principle that spirit never causes or forces the events of matter. Matter is so to speak invited to *open* and to give way or comply with larger hierarchies. “From the beginning on man is a human being. The fertilized egg is or represents a complete human being, not less than the embryo or the new born child or the adult or the old man. It represents the undivided i.e. in-dividual body of man” (O.J. Hartmann, Dynamische Morphologie).

## BEING EMBRYO

Hartmann refers to the essential *revolution* of perspective between the embryo and the adult. “In the adult the spiritual human being grows so to speak in a centrifugal orientation out into the world. Here the world, the environment is the aim. In the embryo however the spiritual essence of man is dormant so to speak in a centripetal orientation in to his body. The aim here is the formation of the anatomical organization of the body itself.” Nowadays we are so much used to the notion that spirit (Mind) is synonymous with consciousness – whereas in fact it is a secondary manifestation of it. We tend to forget that it is spirit that manifests itself during embryonic life.

From the well known German embryologist Erich Blechschmidt I quote three principles or *laws* of embryonic development: “Soul preludes, pre-exercises in the bodily formation” (“Das Seelische übt sich voraus”), “Developmental motions are expressive actions” (“Entwicklungsbewegungen sind Leistungen”) and “There exists no performance without resistance” (“Keine Leistung ohne Widerstand”).

It is very easy to make those principles understandable in the context of an etheric body. Long before we ever took our first breath, grabbed the finger of our mother for the first time, made our first step, those *movements* have been performed by us as motions or gestures of growth (developmental movements). They are in a way gestural performances. Breathing, grabbing and walking are not the result of bodily organization. They are the appearance of human behavior on the functional or physiological level, that are so to speak *pre-exercised* (a prelude) in bodily form. And are breathing, taking something to you or pushing away something also gestures of the soul (astral gestures)? In the end of these lectures we may discover that standing up or staying upright for example is a gesture of the spirit, of the I, rather than a result of anatomical or physiological processes. Have you ever met a friend (like I did), who had incomplete arms and legs (as result of being poisoned during pregnancy by the drug Thalidomide) but however gives the impression that he walked and stood more upright in life than I, as *healthy* and *normal* person, ever might be able to? Very important also is the notion that performance only is possible if there exists a resistance against which the performance has to be performed, has to be developed. No action without reaction or reaction without action. In the words of Blechschmidt, but also in line with the anthroposophical point of view one could state: “Motion or movement has no cause, it is cause”. („Bewegung hat keine Ursache, sie ist Ur-sache“).

## FROM THERE TO HERE, NOT THE REVERSE

In the first week of human development we exist in a point-oriented dimension. The fertilized egg cell more and more undergoes the influence of the structural tendencies of the *spermatozoa principle*. What was outside before conception now appears within the globe that we still are. No growth, no

metabolism (literally), no metamorphosis is present yet. Even time seems to be missing. A kind of mineral phase exists which by itself will end up (and in many cases the human embryonic development indeed ends here) unless a new, reverse or opposite principle will manifest itself. The next phase is reached at the end of the first week when two spheres or areas become discernable: a periphery and a center. It is this polarity that will remain during the whole of prenatal life! Before we are born we have two bodies so to speak: a central one (*core*) and a peripheral one, a nucleus and a mantle.

At birth there is a big separation; what was linked or united will be separated, untied. In German it is called *Ent-bindung* (undoing). In Dutch this same expression is used for the de-composition of the body after dying! It is also a moment of separation, of so-called *Ent-Bindung*. So the central gesture of prenatal development is to separate (*Ent-wicklung*, literally: de-velopment); the gesture of separation is from periphery (*there*) to the center (*here*). Our peripheral body is the *primary* one, our so-called proper or actual body the *secondary* one! Development is not a serial or linear sequence of events. It is rather a cycle of peripheralisation with rooting in the periphery, then the gesture of emancipation and individuation (separation) and finally the center mirroring the periphery reciprocally.

## CHAPTER II (lecture II)

### Emancipation - From Heaven to Earth

#### FROM MINERAL TO PLANT

Only after the nidation of the embryo in the uterus is the mineral phase overcome and transformed into a new phase with a new principle. The centripetally directed forces of the first week are reversed (inside out) into the tendency of peripheralisation. The embryo opens itself again and starts to grow out literally and physiologically. The *peripheral* or *outer* body of the trophoblast starts to reach for the environment, without limitations and boundaries. Metabolism, growth and metamorphosis are qualities of the *outer* body. There the embryo has its roots, its origin! In the center centripetal forces are still at work, the *center* or *inner* body gradually opposes (contrasts) itself from its periphery. All those events (*gestures*) are not the prolongation of the dynamics of the first week. A new principle appears. There exists a kind of break or *fracture* between the first week and the onset of the second week of embryonic development. A great percentage of pregnancies do not overcome this transition! Is this *fracture* or *fault* the echo or reminiscence of the *pralaya*, the discontinuity between mineral and plant phase in human evolutionary development?

The *center* or *inner body* hardly grows and exhibits much less activity. It becomes a two-layered disc (ectoderm and endoderm), more and more distancing itself from the *outer body*. Only a small stalk of mesoderm saves our lives, so to speak. The center of the human organism is at this moment a *two-dimensional* disc. The center itself has no content or substance or middle (*Inne*) yet, there is only outside. We seem to deal here with the *extent human* (*Aushaltmensch*). Only *there* exists, no *here* is present yet. The embryo itself is not really individualized.

This phase represents *the human plant* (*Pflanzenmensch*). And if nothing *new* happens, if no turning point appears, it will end up here with only an *outer* dimension: the so called *wind egg* is the type of pregnancy without the presence of an inner embryo. In evolution, more of the principle of the plant never leads to and never will lead to the principle of the animal. A new principle has to appear. As explained before: Etheric being and astral appearances are **oppositions (contrasting each other)**!

#### FROM GROWING OUT TO GROWING IN

The *central* embryo now is a circular two-layered disc. Realize that the first *body axis* to appear is the dorso-ventral axis. The disc is oriented in the coronal (frontal) plane. Apparently, the most fundamental dimension of man is not the cranio-caudal axis, but the coronal (frontal) plane. Further on we will see that man discriminates himself from the animal by the fact that he regains this plane in the erection of the body, while for the animal it will be *closed*.

The first indication something new is going to happen is the turning around of the developmental form gestures. Now the formation of blood and blood vessels from the periphery (trophoblast) leads to the formation of the heart as the center of the embryo. The dynamics of morphology are completely turned inside out! The periphery is no longer the *outside*, but is the *origin*. The organs are peripheral impulses and they descend into the body, with the heart impulse ahead and first! At the same time the head and *tail* region are polarizing and become discernible. Now the principle of *growing in* appears, starting at the caudal end of the embryo. The notochord and the mesoderm develop now within the embryonic plate and the first Anlagen (primordium) of organs appear. Therefore, the formation of the heart represents the archetype of organ formation i.e. from outside to inside!

Now the third dimension in the embryo develops: a metamerised trunk between a non-segmented head and *tail*, the mesoderm with threefold appearance (notochord, somites and lateral plate mesoderm) between dorsal (ectoderm) and ventral (endoderm), together with the intermedial rhythmic principle of heart and blood vessels. The embryo has now achieved an inside dimension (*Innengewebe*) and, more importantly, has gained individuality. All these events seem to represent the important *incarnation-act* referred to by Rudolf Steiner as the *seventeenth-day event*, marked by the embodying of the astral individuality guided by the I-organization. If this fails and the heart is not developed, man will never incarnate but rather will end up being miscarried or as a *wind-egg*. But the embryo still has plant-like features: segmentation dominates, it has an *open* body and it has not *rounded up* so to speak. It still has neither beginning nor end and the vegetative principle of repetition and growing out dominates.

## BODY AXES

The first direction to appear is the dorso-ventral axis at the beginning of the second week with ectoderm (*nervous pole*) at the back and the endoderm (*metabolic pole*) at the front. As we will see later on, this axis is the axis of motion.

At the end of the second week the cranio-caudal axis is developing, followed by the lateromedial direction. The latter marks the symmetricalization between left and right related with the in growth of the notochord. "The left-right axis is the axis of mirroring symmetry. Left and right cooperate as fellow players in the same function". (Die Rechts-Links-Achse ist die Achse spiegelbildlicher Ähnlichkeit. Rechts und links wirken als Mitspieler zu einer und derselben Funktion zusammen).

At this stage this is all that is accomplished. Before those dynamic principles will be worked out completely, the embryo has to develop a circumscriptive and limited body with the early exterior-interior dimension and extremities appearing on the outside. After the body formation processes of the fourth week (and later) the dimension of parietal - visceral (outside - inside, exterior - interior) will appear in the center.

## FROM PLANT TO ANIMAL, FALL OF SIN

During the third and fourth week the process of delamination occurs. The formation of a real inner space, outlined by an *inner* boundary: endoderm, visceral pole (*Eingewand*) and an *outer* boundary: ectoderm, parietal pole (*Außenwand*). The whole embryo resembles the configuration of the head. *Folding up* (flexion) is the gesture of emancipation and individualization found in animal organization. Here the animal phase so to speak arises. The vegetative principle is now enveloped by the animal principle of condensation and concentration at the front (cranial) and rear (caudal) pole. The *open Gestalt* of the plant is now contained by the *closed Gestalt* of the animal. Segmentation as an etheric principle is now superceded by the animal principle of *autonomization*.

The whole gesture can be described as the onset of a *fall from sin* after a phase of *paradise*. In growing behavior the human embryo tends to be separated from its openness (*innocence*) to the (cosmic) periphery, a process, an act (!) that for the moment will end by the event of birth. This gesture can be described as a *gesture of the astral organization, of the soul*. It may be called *animalization*.

The formation of tubes also belongs to this stage. One on the dorsal side is the neural tube, related with closing, separation and antipathy. On the ventral side, the primitive gut, related with opening, unfolding, sympathy. This represents the polarity between the ectoderm and the endoderm.

## CHAPTER III (lecture III)

### Embryo of Freedom – Between Heaven and Earth

#### MIRRORING OF MACROCOSM AND MICROCOSM.

The inner body of the embryo is mirrored by and in the outer body. In fact we should not talk about the *inside* and the *outside* of an embryo before this stage of delamination has been completed, before this stage the polarity was more one of *here* and *there*, of center and periphery! If we go from the outer boundary of the *real* embryo we meet in order of sequence the spheres of ectoderm (nervous pole), mesoderm (middle sphere) and endoderm (metabolic pole). On the other hand going from the amniotic sac to the periphery we meet in order of sequence the amniotic membrane (related to ectoderm), the chorionic membrane (related to mesoderm with the blood vessels) and the trophoblast (primarily related with endoderm and metabolism). Here the huge polarity between microcosm and macrocosm is present, setting the stage for the idea that being born means a final physiological mirroring of our peripheral dimension to a centripetal dimension. Is not the ultimate polarity in the unborn child that of mother (*mater*) and me? Are we not born in a *new* outer body which is now represented by the world as it appears to us at *first* sight by our senses (ectoderm-amnion) on one level, but on a deeper *second* level by our feeling tones (mesoderm-chorion), on a much deeper and more hidden level by our really *inner* senses (endoderm-trophoblast), which is essentially characterized by the polarity of I and THOU (Buber), of ME and GOD?

#### FINALLY, THE EXTREMITIES

In this period the primordium (*Anlage*) of the extremities appear. In the beginning they appear as flat *fin-like* structures. The main axes are oriented within the context of the whole *head-shaped* embryo i.e. to the center of the umbilicus (navel). An important feature however, is that in the outgrowth of the extremities the segmental (reflexive) organization of the trunk tends to be superceded. In a kind of centripetal condensation the five to seven constituting segments are concentrated (*fused*) into a limb bud. In this bud the arrangement of the hand and foot respectively are organized. From this *point* a new diversification or peripheralisation appears in the fingers and the toes as well as a new fragmentation (*segmentation*) in the elements of the arm and leg bones. The formation of the brachial and lumbosacral plexus may be considered as operating under this principle of a new arrangement (*Neugliederung*). Extremities are not the *result* of the trunk, they are *new* elements, which seem to withdraw (separately) from the influence of trunk organization (e.g. the limb bud is autonomous, the skeletal elements of the extremities develop from distal to proximal).

The extremities are the outgrowing (expanding) dimension of peripheralisation. While the elements of the girdles still originate from the parietal mesoderm, still a *trunk-like* dimension, the long (enchondral) bones of the extremities itself are new impulses. The extremities do not undergo the influence as the central organization of the trunk does. They are neostructures and quite autonomous in their development.

As parietal structures the extremities belong to the sphere of the *Upper pole*. As structures radiating to periphery they also represent an opposition to the head and *belong* to the sphere of the *Lower pole*. Extremities bring the dorso-ventral axis to a new appearance and convert the direction of the *metabolic pole* inside-outside, *resulting* in the metabolic-limb-system.

#### AFTER GROWING IN TO GROWING BEYOND

The extremities now are growing out in the dorso-ventral axis as well as in the central-periphery axis. The embryo is still more or less *head like*. It is dominated by the gesture of emancipation (freedom), which is the basis for the animal or astral gesture of gaining the antipathetic position of consciousness. This is the dominant principle of the human head in the adult. The transition of the embryo of the second and third week to that of the fourth week was not a matter of *more of the same*. It was characterized by a discontinuity and an opposition. Now we may look out for another gesture that might oppose the animal principle of folding and delamination (in embryological terms the so-called *Abfaltung* which is German for 'defolding') with which we shaped an inner space for ourselves with psychical-astral qualities and possibilities. This opposition is represented by the outer gesture of

*extension* or stretching, and on the inside by the polarization of the ascending head pole or nervous pole and descending tail pole or metabolic pole. But there is more, there is the gesture of a development (literally). The embryo is *opened* again so to speak. It opens up its ventral dimension by way of the outgrowth of the extremities and by the way the head pole is *extended* out of the trunk as well as the pelvis, both in a polar tendency. This extension development is best noticed in the neck and waist region. In other words: since head and pelvis are *retro-flexed*, a neck (primarily) and waist (secondarily) appear.

This erection or retro-flexion results in the onset of an erect posture: the pelvis, the trunk and the head are positioned one upon another, which is at least a prerequisite for the upright posture of a human being. The processes that led to enfolding (flexion) and concentration are not lost however. They are maintained within the organism, the contours of the organs like heart and liver are so to speak retracted within the contours of the trunk. The main polarity-axis i.e. the cranio-caudal axis again comes into appearance by this de-flexion gesture, but is now, unlike in the third week, not determined by outer and peripheral forces, but by the center of the embryo itself. In the head the emancipatory gesture of envelopment and concentration is further elaborated: in the rounding up of the skull (neurocranium) the brain becomes spherical and the viscerocranium (face skeleton) loses its openness, the openings (including that of the eyes) are concentrated and focused in the front.

### FROM TIP TO TOE

The extremities however also represent the outgrowing dimension of peripherisation. It is important to understand this polarity or opposition between head and extremities. According to Rudolf Steiner it is this polarity that has to do with the essential character of man, being also a creature of the past (head) - man as consequence - as well as a being of the future (extremities) - man as action. Here in the extremities we open to the world, to the environment willing to work with and within it. In our extremities we meet the world and realize our karma as well as create it. It is a paradox that the first impulse of an extremity is not the outgrowth proximal to distal but the other way around!

Both principles of polarization mentioned above have to be taken into consideration in order to understand the essential difference of the upper and lower extremity. The arm and leg respectively are polarized within the cranio-caudal axis. Both extremities appear in the fifth week first as *finlike* structures directed towards each other (like the jaws of the *head* that the embryo at that moment in fact is). Next they adduct (its growth gesture!) and in their orientation concentrate around the center of the folding embryo (the umbilicus). For the arm this means a kind of pronation movement, with flexion in the elbow, which becomes directed caudally and outward. So the hands and the arms are situated upon the heart (region). The hand is already positioned as a *grasping hand* with flexed fingers and a thumb positioned at the palmar side, proximally in respect to the fingers. Remember that all those gestures occur as growth movements: joints do not exist functionally yet. The legs arise about a week later and position themselves in relation to the (at that time huge) umbilical cord - which is the opposite pole of circulation in respect to the heart - in a kind of supinated position. The knee is also flexed and directed outward. The foot is in supination and dorsoflexion. It grows *trotting* against the body wall and is flattened (no flexion in the toes). The relationship between the heart-hands and umbilical cord-feet is meaningful: heart and hands are orientated towards *here*, cord and feet towards *there*. Isn't this a reminder of the later situation of the arms and hands as free from gravity and periphery (*open ended chains*) and the legs as gravity-bound structures in *closed ended chains*?

## CHAPTER IV (lecture V)

### The extremities – Mediating between Heaven and Earth

#### ARMS AND LEGS AS POLARITIES

The two extremities exhibit a polar rotation in their growth in relation to the deflexion or extension of the whole embryo which results in the development of the neck and waist. While the arms externally rotate, the legs orient in an inward rotation. This results in the well known opposition of flexor and extensor sides of the two extremities in the so called anatomical position; in the arm the pre-axial zone is turned to lateral, in the leg it is orientated medially. In its growth gesture the legs so to speak *follow*

the deflexion of the pelvis and is oriented towards the earth and gravity, the arms so to speak overcome this orientation and follow the de-flexion of the head. As a result or as a simple gesture the embryo *opens up* and within the erect posture - with the head balancing upon the trunk, which in its turn balances upon the pelvis and legs - the primeval coronal (frontal) plane (second week of the embryo) is regained. Regarding this orientation (dorso-ventral axis) as well as the erect position (cranio-caudal axis) it may be stated that they are now recapitulated by an inner *drive* and not, like in the second and third week, by outer forces or relationships. Unlike the *plant-like* erected or stretched embryo of the third week, this gesture of erection and extension is a gesture of freedom and is *from inside*.

Goethe already emphasized the strictly polar orientation of upper and lower extremities as essentially human. In related primates and mammals the polarity is lost again with the result being that the lower pole (pelvis and legs) become too *weak* to maintain the erect posture. This may be indicated as a loss of empathetic openness and orientation to earth and gravity. Similarly the arms and hands lose their *earth-free* potential and like the head they again *open up* and become more instrumental and specialized toward functions related with environment. In quadruped animals for instance the external rotation of the arm is *corrected* by a pronation motion which results in an *internal rotation* of the forearm, which becomes fixated in this position like a leg (*the arm acts like a leg*). In many primates the polarity is lost by a weak internal rotation gesture of the legs resulting in a *four handed* animal. This all raises the image of the erect posture as a quality that is performed by the human in the most extreme and essential way and maintained, as well as restrained ('retarded') from animal specialization as such. This opens the eyes for the idea that going upright is primary and going on four feet or four hands is secondary. This is completely the reverse from the *regular* concepts regarding phylogeny. Man is not the image of a creature that erected himself from the quadruped position, but rather he stayed upright and maintained the original potency of the embryo. This is the principle of retardation and restraint (see next chapter).

## FREEDOM IS IN BETWEEN

Returning to the language of Gestalt the events up to now may be summarized as follows: The motions of flexion, envelopment and delamination (the so-called *Abfaltung*, vide supra) result in an inner world (space) related to the outer world by the senses and extremities. It is the inner world that we know (perceive) in all her manifestations that differentiates us from the domain of the animals, where body form, structure and the instinctive life are one and unified. In the gesture of erection and de-velopment (*Ent-faltung*) the compulsory gesture of closing and rounding (encircling) of the inner world is overcome and impregnated by the sovereign forces of the erected human. The path of experiencing the forms of the embryo is via a participating attitude in order to understand their gesture. We now meet the moral experience that might be revealed by this approach of participation: human embryology is the embryology of freedom. Freedom here is defined as the balance between too much of this (specialization) and too much of that development. So freedom is a deeper quality and emerges from the third and middle dimension.

The vertebral column in particular and the trunk in general are the mediating space of freedom. Here the extreme of *being there* and sympathy is balanced by the extreme of *being here* and antipathy. In this respect it is interesting to adapt the concept of the three heads. There is a *head-head* i.e. the skull as an extremely introverted principle like the principal of the neural tube and there is a *pelvis-head* with visceral functions and gestures, open and mobile. In between there appears the intermediary *head of the thorax*, with their constituting elements. The ribs each at their individual level perform the gesture of radiation, like the extremities, but as a composition or as a whole constitute a head-like structure (thorax). On a hierarchically higher level the ribs reach what they cannot reach on their individual level (*Steigerung* or functional elevation or synergy). The same is true for the vertebral column where more than thirty osseous elements, which individually make the gesture of enclosing heads, constitute the *fifth extremity* (important work domain of the physiotherapist). The trunk is the sphere of the THREE AND ONE, where it all *comes from* and *may lead to*. This draws the attention towards the vertebra-rib-unit as the primeval unit of the skeleton. It is in fact a *lemniscate* in manifestation, a primeval image (*Urbild*) from which all the other skeletal units may be considered to be a metamorphosis. The scapula e.g. and the os coxae as such are metamorphoses of *the* vertebra, the arms and legs as ribs, again as polarities turned inside-out, upwards-down and so forth.

## ARMS MEDIATE

A shoulder girdle with arms and pelvic girdle with legs may be seen as polarities. They both represent the polar tendency of outgrowth opposite (in contrast) to the gesture of the head development where the principle of *emancipation* and *antipathy* is restrained. The polarity of the two extremities in their turn is related to the cranial (ascending) head pole and the caudal (descending) pelvic pole. In this view their polarity is that of above (*upper pole*) and down (*lower pole*). If one however, broadens the scope, one could state the existence of **three** pairs of extremities i.e. jaws, arms and legs, with the shoulder girdle and arms appearing in the middle. This can be very well demonstrated by the polarity of a circle and its radius. The jaws anatomically fuse left and right into a closed circle, the legs radiate anatomically and are not functionally able to overcome this parallelization (of tibia and fibula). The jaws in the gesture of the head are of closure, of antipathy, of *here*. The (distal) legs in the gesture of periphery, are of opening, of sympathy, of *there*. The arms however can be parallel (supination) like a leg or can cross and close up like a (animal) jaw (pronation). This is dramatically shown in the painting of Leonardo da Vinci (The Last Supper); Christ mediating between the pronators (demanding) and supinators (asking). The middle dimension of the arms is also dramatically demonstrated by the fact that crossing (*closing*) opens up the arm *as a leg* and orientates it to the earth (supporting) and on the other hand parallelization (*opening*) closes the arm so to speak for the earth and opens it up to heaven.

The opposition between shoulder and pelvic girdle also exists in the dorso-ventral axis, with the arm orientated ventrally, the leg dorsally. The scapula is orientated in the coronal (frontal) plane, the plane of reserve, of restraint, (*Zurückhaltung* according to Steiner). The os coxae is orientated more in the sagittal plane, the plane of balancing, (*Ausgewogenheit*). A striking feature is the clavicle. In evolution (phylogeny) the clavicle and the coracoid process are a very *old* and original feature. As soon as quadruped locomotion prevails, this is the first bone to *disappear*, as soon as climbing or grabbing prevails, it is *retained*. The retention of the clavicle is an important phenomenon in man. It relates strongly with the position of the scapula on the back (and not on the lateral side of the thorax as in quadruped locomotive animals). This bone is the first one to ossify (and the last to be ossified). In the pelvic girdle there exists no equivalent to that structure (ilium ~ scapula; pubis ~ precoracoid; ischium ~ coracoid). An evolutionary rule seems to be: *where the clavicle appears, earthbound quadruped locomotion is not the aim.*

## CHAPTER V (lecture V)

### The extremities – Retardation (restraint), going (and staying) upright

#### METAMORPHOSES IN THE HUMAN SKELETON

Breathing in the strict sense of inspiration and expiration is the rhythm of in and out, of internal and external, of here and there. The rhythm of awakening and sleeping may also be considered as a rhythm of breathing, be it that the poles between which the breathing takes place, are different. Does the former breathing take place for the preservation of life and consciousness, while the latter means the rhythmic loss of consciousness, though with the preservation of life. Reincarnation could be considered as the ultimate level of breathing: here inspiration and expiration occurs with the loss of (earthly) consciousness and loss of (earthly) life. Since the head and extremities are their reverse, this might elucidate the repeated statements of Rudolf Steiner about the transformation of the trunk of the former incarnation into the head of the new one. “The head that now is balancing on your trunk, is the altered organism of your earlier preceding life” (Der Kopf der jetzt auf Ihrem Rumpf steht, ist der umgebildete Organismus Ihres vorheriges Lebens). To understand this metamorphosis morphologically we need projective geometry and to imagine that behind the deflexion and extension (erection) of the upright standing human lies the hyperextension (which is a flexion in the other dimension). Development turns inside out into envelopment and so on, till again in the cosmic point like dimension of a new conception all the forces and intentions of the former incarnation(s) concentrate as a *Geistkeim* (spiritual germ) which *de-folds* itself in the appearance of the head-shaped organism of the embryo. In our head *past* is concentrated, which in turn develops into a new appendicular organism (trunk and extremities) with which we meet the world and shape our biography in the interaction between old and new karma. Dying as expiration, conception as inspiration, head as

past (in), extremities as future (out). Morphologically one can transform a skull out of the appendicular skeleton by turning the latter completely inside out (including left and right) like the *invagination* of a hand glove. It is a total inversion.

## RETARDATION IN THE LOCOMOTOR SYSTEM

Honoring the great anatomist Louis Bolk we all should participate in his astonishment and enthusiasm when he discovered the principle of *man being a retarded (restrained) fetus*. The main features he focused upon at first sight were the nakedness of the human adult, his chin and the position of the foramen magnum in the skull. Nowadays a lot of other phenomena can be interpreted as retardation features of the human. Retardation means that through the potency of man he is able to retain the original and primeval i.e. embryonic body configuration.

In comparison to the hand of primates the human hand is strongly retarded. It goes *back* to the primeval hand of the oldest terrestrial vertebrates. The great mobility of the *cranial* (rostral) extremities is a primitive feature already existing in very low primates. The broad thorax which is of benefit for the upright position, allows the scapulae to be positioned more posteriorly at the back and is an embryonic feature retained by man, but lost by the higher primates. The human scapula lacks the typical elongation of the mammalian scapula; this allows the high mobility of the shoulder girdle and, again, is a phenomenon of retardation (restraint). The strong external torsion that exists in the humeral bone with a medially positioned head also fits within the principle that the shoulder girdle and arm have been restrained from locomotion by guarding their embryonic characteristics and so forth.

Retardation however can also mean retardation of growth. Extremities develop from the distal end towards the trunk. A foot or hand is always nearer to its adult proportions than the forearm/foreleg, which again is larger proportionally than the upper arm/foreleg. Retardation of growth leads to a stronger development of the elements near the trunk: man has relatively small hands and feet, relatively short toes and a relatively big heel, relatively short forearms and so on. The relatively long legs of the human are the outcome of a very strong retardation by lengthening the time of growth, resulting in long human legs. In general it can be stated that retardation means being restrained from animal specialization which allows explicit human features. *The more animal specialization, the less human explicitness* (Verhulst, 1995).

## CHAPTER VI (lecture VI)

### What makes us free? – Man as Embryo

#### REVIEW - THE ANATOMICAL POSITION?

What exactly is the *anatomical position*? The answer to this question depends on the lens you apply. Both girdles and related extremities can be seen as (in their turn oppositional) metamorphoses of a vertebra-rib-entity. In the adult skeleton the echo of this transformation is still traceable. Os coxae and scapula can be transformed into each other and be reversed by turning them inside out in all directions and dimensions. From the configuration of two scapulae the primeval configuration of a vertebra can be deduced. Taking this view it turns out that the *anatomical position* of the arm has 90 degrees of abduction. Does the arm *belong* to the horizontal plane? This seems to be related with the fact that the primary limb bud of the arm has a position angular to the vertebral column, while the limb bud of the leg acquires a position more in line and in parallel to the vertebral column (back). From that position, the arm can mediate between all the main planes and directions. On the other hand (with another view) the arms in extreme elevation with the volar side of the hands backwards and the forearm in supination, express the ultimate *anatomical position* referring to the gesture of unfolding (*Entfaltung*).

#### STAYING UPRIGHT AND RETARDATION

In comparison with the hand of primates the human hand is strongly retarded and dates back to the primeval hand of the oldest terrestrial vertebrates. The great mobility of the *cranial* (rostral) extremities is a primitive feature, already existing in very low primates. The broad thorax (a benefit for the upright position) which allows the scapulae to be positioned at the back, is an embryonic feature which is

retained by man but lost by the higher primates. The human scapula lacks the elongation of the mammalian scapula; this allows the high mobility of the shoulder girdle and, again, is a phenomenon of retardation. The strong external torsion that exists in the humeral bone with a medially positioned head also fits within the principle that the shoulder girdle and arm have been restrained from locomotion by guarding their embryonic characteristics.

In general it can be stated that retardation means being restrained from animal specialization which allows the explication of human features. "The more animal specialization, the less human explicitness". (Verhulst, 1995)

### **IN THE BEGINNING THE WORD**

Actually this means that the principal polarization of the two *body ends* - with the characteristic *rolling up* (*Endeinrollung*) and congestion (*Aufstauung*) at both the cranial and caudal ends - is retained in the human. The brain-pole and the abdomen(pelvis) pole are orientated ventrally, while the animal leaves this primeval embryonic organization and folds back the brain (dorsally) allowing for the development of a manipulator snout. It does not keep the pelvis in an upright position. Dr. H. Poppelbaum stated: "In his cranial pole man reserves something from the past which is lost by the animal; in his caudal organization man reaches for an engagement with the earth which is closed down for the animal". All together the next composition (aesthetic) is invited to come into appearance. In principle, the upright position of man is allowed and enhanced by maintaining his embryonic characteristics. Since the pelvic girdle and legs are completely dedicated to balancing and locomotion, the hands are kept free from that and become available for detailed manipulation. This frees the head, and in particular the face, from manipulatory specialization and preserves embryonic spatial relationships within the skull allowing for the enormous development of the brain and the possibility of keeping the mouth and larynx in a unique position to enable speech. To summarize: throughout phylogeny and ontogeny it is speech (*the word*) that appears and becomes explicit as a discreet feature of homo sapiens.

### **MAN AS MEDIATOR**

If we go back to conception we might see the image of an enormous cosmic field of tension that is balancing between centripetal, contracting, earth bound forces and centrifugal, relaxing and opening, heaven bound forces. This is represented by the polarity of the sperm cells and the egg cell. In this labile balance between *here* and *there* biology is *opened up* for greater levels of hierarchy and the incarnation of spirit *into* matter. After a long process of metamorphosis there stands the human Gestalt. He brings his head - this pole from the past, this closed sphere of abstraction and antipathy - to heaven. On the opposite side he opens his radiating pole of sympathy and openness towards the earth to work on it and to create new relationships (karma). Again, balancing and freedom is gained in the middle. The key phrase so to speak for freedom is and-and, plus neither-nor. Only an extremely polarized organization enables a being to behold the dimension of the middle and its freedom.

### **ACKNOWLEDGMENT**

*The notes have been edited and appeared as English abstracts in the official conference book called Bausteine einer anthroposophischen Physiotherapie - Dynamische Morphologie und Entwicklung der menschlichen Gestalt . Published by the Medizinische Sektion am Goetheanum, 1999 Second revised edition, 2003, ISBN 3-7235-1183-X*

LAST VERSION EDITED BY THE AUTHOR: 1 APRIL 2005

JAAP VAN DER WAL