Postulating that our neurological models for musculoskeletal support, movement, and emotional expression come from archetypal forms in early organisms

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Summary

The ability for humans, in principle, to almost effortlessly support themselves against gravity, to move with grace, and to express themselves in subtle and beautiful ways is amazing, given the number of moveable joints, variety of obstacles and intentions, and possible emotions to express. The actual mechanics are obviously astonishing but the models for these activities, in origin, must be simple. The basic hypotheses concerning these models are the following:

The neurological model for the control of our musculoskeletal system is a simple support system from early organisms. This model involves a complementary relationship between the dorsal and ventral surfaces.

There are three functionally distinct parts of the body, though not visually observable. These parts, named here "the director, motor, and rudder segments," are functionally distinct during optimal posture and movement. Healthy balance, posture, and movement result from their relatively independent yet coordinated actions.

Forms of locomotion used by early organisms: peristalsis, lateral undulation, and dorsal-ventral undulation are present in us yet. Four frozen phases of the dorsal-ventral wave, for example, constitute four distinct postural and personality styles.

I present these hypotheses together in this short paper as an introduction to a new illustration-dependent way to conceive some of our psychophysical realities. The hypotheses came from efforts to develop mental imagery to assist students in learning the Alexander Technique (AT). In addition, a little known theory concerning four basic emotions and personality types, called the Fusion Theory, provided an initial concept of personality types. Four fixed postural patterns that I observed in teaching AT linked well to this personality typology.

There is research that supports the use of mental imagery to affect change in body use, mostly in the sports and dance fields, but none exists addressing the specific imagery derived from these hypotheses.

If these theories were confirmed, several areas could stand to benefit. Through imagery, some concepts involving musculoskeletal health could become more accessible to health-conscious and suffering individuals and give them a new way to become more connected to and responsible for their postural and mental health. Kinesiology, neurology, and psychology could develop a closer connection if research found that some aspects of posture, movement, and emotion all developed from allied origins. Specific benefits could come to the study of facial and body expression, understanding the physical basis of emotion and attitude, and understanding the experience of qualia in general.

Introduction

Two health problems that often elude full understanding and satisfactory solutions are musculoskeletal pain and emotional problems. In this paper, I propose new models to explain how our postures and movement patterns are neurologically controlled. Following that, I propose a related model for visualizing patterns in emotional expression and personality as it relates to body support and movement. The explanation of the theories is dependent on illustration and, to some extent, imagery.

I suggest that several principles appropriate to posture and movement, as well as connected to personality and emotion, can be derived from early life forms through illustration and imagination. In other words, early life forms can help show us the way to healthy posture, graceful movement, and, perhaps, to some extent, healthy emotional response. Since the subject matter of this paper is so large, its intent is primarily to encourage thought and new directions in research.

Aid in the development of the perspective expressed here has been primarily from two sources. Originally, I used illustrations to clarify visual and kinesthetic imagery (1) that was developed to assist in teaching the principles of the Alexander Technique (AT) (2). Some of AT's principles were the springboard for the hypotheses concerning how the dorsal and ventral surfaces cooperate in body support as well as the hypothesis that the body can be divided into three functional segments. The hypotheses, however, would be, at this point, unrecognizable to other teachers of AT. Subsequently, a little known theory of personality types and basic emotions with which I was very familiar, known as the Fusion Theory, was useful as a stepping-stone to developing the frozen dorsal-ventral wave hypothesis (3).

Hypotheses

An old support system

Figure 1 – Archetypal dorsal and ventral surfaces

The system of support (against gravity) of early organisms became the instrument for neurologically directing efficient support in higher life forms. This means of support is based on a complementary relationship between the dorsal and ventral surfaces. This complementary relationship involves a dorsal surface that expands and a ventral surface that contracts to counter gravitational forces (Fig.1). We already make a distinction between extensor and flexor muscles that lie close to the dorsal and ventral surfaces and it has been recognized that extensors and flexors, as "antagonistic pairs," are complementary in postural control (4). However, the hypothesis presented here significantly expands what commonly is considered dorsal or ventral. (Every surface is either dorsal or ventral except perhaps for a thin zone separating the two surfaces). An organism is most appropriately supported when the dorsal surface is generally expanded and the ventral surface is evenly contracted or toned. The resultant strong dome- and arch-shaped qualities of the dorsal

surface that provided support for early organisms became not the actual but the neurological model for appropriate human structure (posture). This neurological model, in turn, places bones where they need to be in order to support most efficiently the weight of the human body, which is far too large and heavy to gain actual support from its outer dorsal surface.

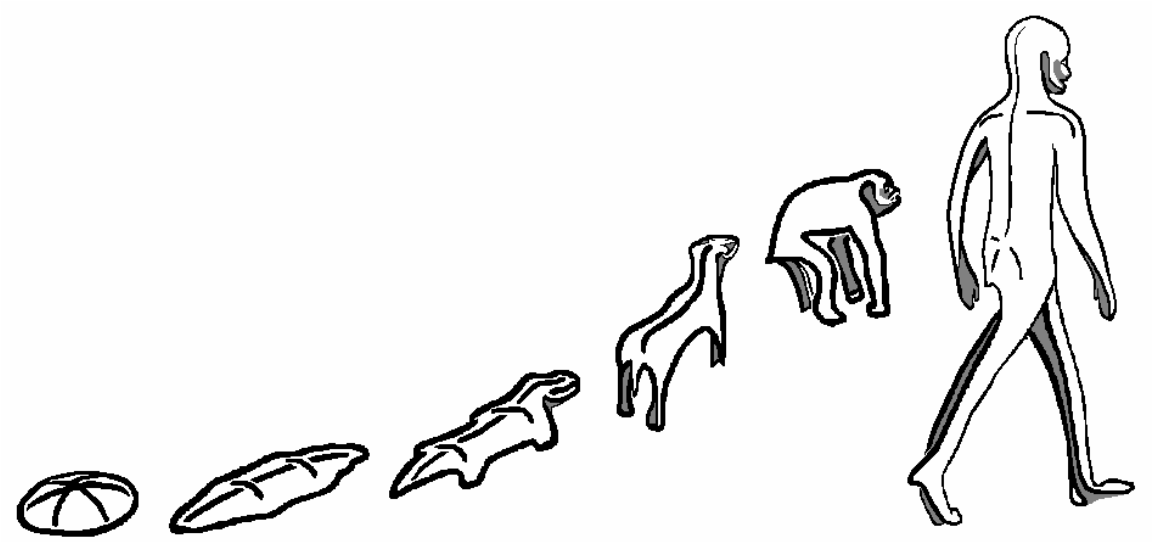

Figure 2 – The evolution of dorsal and ventral surfaces

Figure 2 shows only the dorsal surfaces but implies where the ventral surfaces would be. This allows to be seen the concept of support from an arched dorsal surface throughout evolution. Imagining that you have no bones and only a dorsal surface to support you was how the illustration was originally used in a postural image exercise. Also from these drawings came the mental image to "calm up and tense down."

An aspect worth mentioning about this perspective is that a dorsal surface that is highly expanded with a ventral surface that is very contracted would constitute a curled fetal or embryonic position. Yet, a fully open and upright position retains elements of expanded dorsal and contracted ventral surfaces.

One last observation is worth pondering. By looking at figure 1 again, which shows an archetypal form of an early organism, one can see that the major methods of perceiving the environment, as well as acting upon it, seem to have developed along a border surface between the dorsal and ventral surfaces. This area, in early organisms, may have been especially close and responsive to the immediate environment. Is there greater nerve activity along the length of this zone's surface and is it somewhat capable of "opening" or "shutting" to perception and activity, as eyes can, for instance?

Three functional segments through evolution

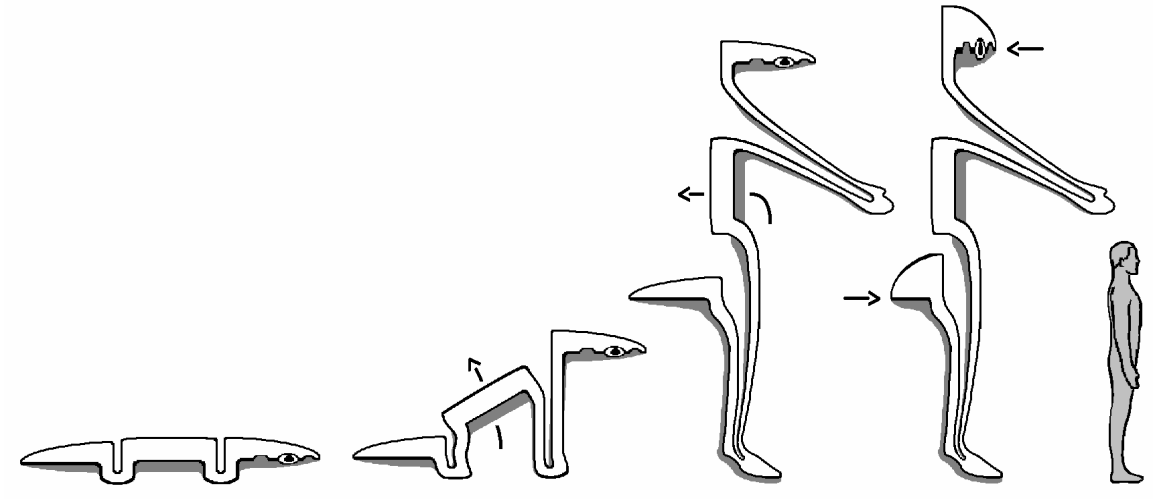

Figure 3 – The evolution of three functional segments

The human body, as are many early forms of life, is made up of three functional parts that help determine posture and movement. Here they are referred to as the "director, motor, and rudder" segments (Fig. 3). These segments of the body have distinct functions to carry out in support and movement. The director portion runs from the mouth to C7, across the shoulders and includes the front or upper half of the forelimb or arm. This part of the body has freedom to move and even swing about and, as a result, it has the ability to physically direct the movement or posture of the remaining parts. Next, the motor portion is from T1 and the back portion of the shoulder and forelimbs or arms back (or down) to L5, and splits the back limbs or legs at the greater trochanter and over the knees. The motor segment is the place where the most effective work or effort takes place and is felt to take place in optimal use of the body. Finally, the rudder runs from S1 and the outer portion of the legs (which originated as a back portion) back to the tip of the tail, vestigial or otherwise. The rudder portion, like the director portion, has the ability to freely move or swing and further influence movement choice in the entire body. The segments are shown here as almost totally separated from each other in order to indicate the large degree of functional freedom possible when the image is used as a postural or movement image exercise. Also of interest is the idea that the director and rudder portions maintain their horizontal bearing throughout evolution, with only the middle motor section becoming "upright."

The legacy of early locomotion

Early organisms' methods of locomotion (peristalsis, lateral undulation, and dorsal-ventral undulation, as examples) became the model for neurologically directing graceful and efficient movement of appendages (limbs or wings, for example) in higher life forms. This idea is by no means new. We can see it enough that it does not need to be postulated. We can especially see dorsal-ventral and lateral undulation in higher organisms of all kinds. However, there are implications that should be considered.

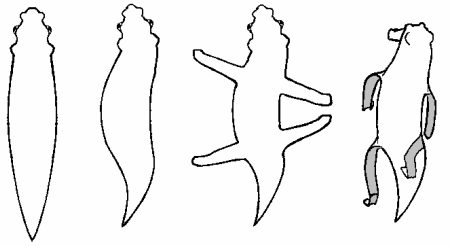

Figure 4 – Lateral undulation

Figure 5 – Dorsal-ventral undulation

Lateral undulation (Fig. 4) is the primary impulse involved in walking and the dorsal-ventral wave (Fig.5) seems to be primary in hopping. Upon observation, galloping seems to be a combination of lateral undulation and dorsal-ventral undulation. This combination appears in various mixtures in mammals as a "softened" hop and is observable in many animals running, whether a dog, a buffalo, or a squirrel.

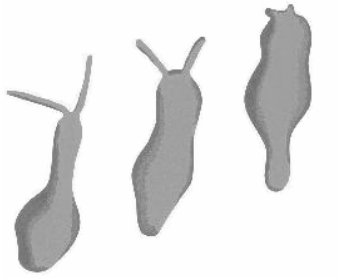

Figure 6 – A proto-emotional garden slug?

The point that I wish to introduce here is, however, that primal forms of locomotion exist within us in both structural and emotional ways. Consider, first, the movement of a garden slug (Fig.6). It slides along with a "foot" that uses a pedal wave crawling action (5) but, in addition, it can advance or retreat in its immediate surroundings by completely changing body shape…expanding in the front and shrinking in the back, or visa versa. Is there any distant connection between this behavior potential and emotion? (6) The first stage in the illustration of the slug seems like one of caution, or extra sensing of the outside

environment up ahead. The last stage seems closer to assertiveness. To be a bit playful, isn't fear akin to caution and anger akin to assertiveness? Can't the face turn red (expand) in anger and white (contract) in fear?

In larger and more complex organisms, shape change, seen in the slug, is generally unnoticeable. Perhaps this is because a skeletal system and striated muscles fill much of the body in higher organisms, obscuring the underlying fluidity of intention. Higher organisms also have a greater ability and need, through voluntary musculature, to hide their intensions. It is my suggestion that the change of shape or the "shrinking" and "swelling" that is so observable in a garden slug is much of what we experience or refer to as "feelings," or "qualia." In other words, to feel angry or afraid is to feel your surface in different shapes. This is analogous to a balloon with a rubber surface of varying thicknesses, degrees of elasticity, and, therefore, shapes. Where you feel "stretched" or "expanded" and where you feel "dense" or "contracted" determines the character of the feeling. Could this be true even when we sense supposedly non-emotional events, like "green?" Could our subtly changing surface shape be the experience we have that answers the problem posed by Nicholas Humphrey to explain what it is like to be the "subject of sensations?"(7)

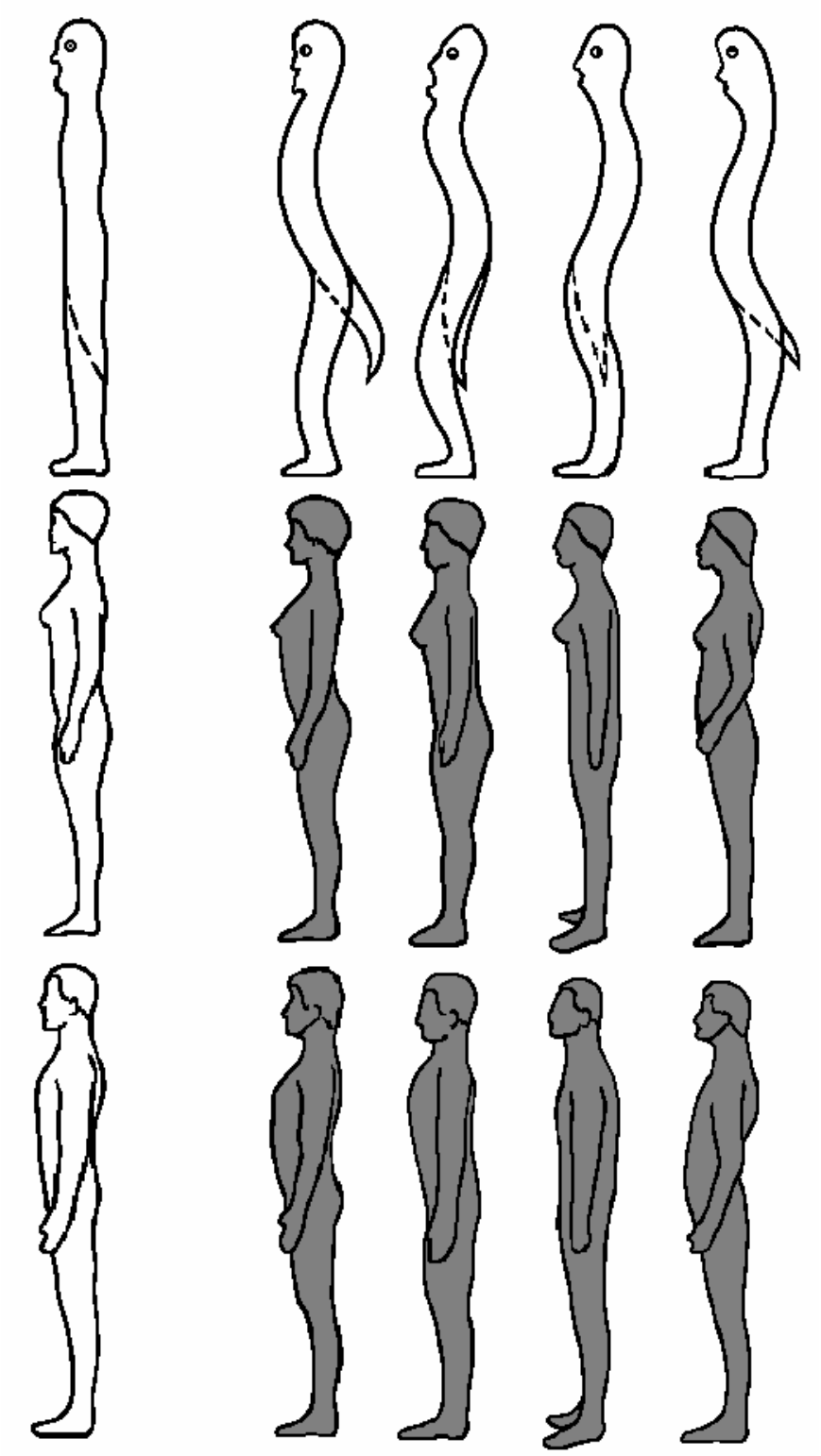

Figure 7 – Dorsal-ventral wave types

The next proposed connection between movement and emotion is more complex but perhaps more compelling. I drew the illustration with columns of characters here (Fig. 7)

including both somewhat cartoon-like and more realistic figures of men and women, because of a perception that a typology of postures could be created. The drawings of the more realistic characters were determined by the waves of the "archetypal" forms at the top of the illustration. What seems to catch the eye is a sense that while viewing these figures we are looking at various personalities as well. This excludes the separated column to the left, which is merely the neutral template from which the various figures diverge. From this illustration, from AT teaching experiences, and from the experience of the Fusion Theory of basic emotions and personality types mentioned earlier, the hypothesis surfaced that there is a direct relationship between four frozen phases of a dorsal-ventral wave structure and four forms of human posture and personality types.

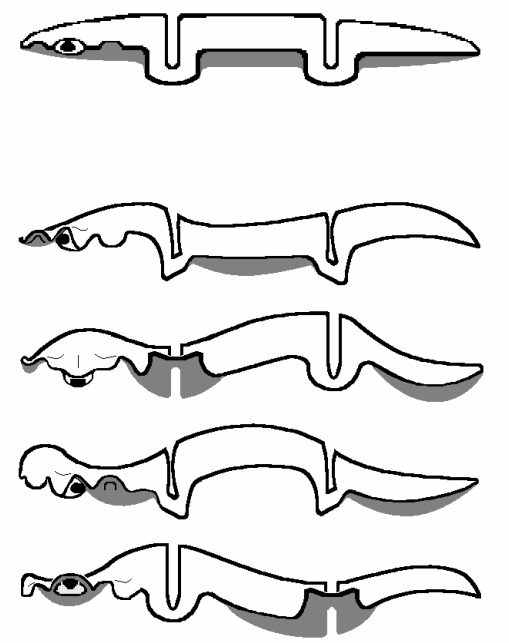

Figure 8 – Characteristics of the double wave

More exactly, I hypothesize that there are four distinct phases of a frozen dorsal-ventral wave in people that correspond with four postural patterns and four personality types. These wave phases also correspond with ease or difficulty with showing emotions such as of anger (self-assertion), fear (perception), love ("warmth"), and pain (self-knowledge).

These ideas may seem to be getting more and more fanciful. However, cartoonists (and people who enjoy cartoons) have always known that subtle shape is connected to emotion and personality. (In addition, cartoon characters frequently are drawn similar to our relative feeling of ourselves, as in a homunculus form.)

First, we will consider the postural aspects of the hypothesis. Study the drawings above and see if the types of postural patterns, suggested by the more human figures, may be derived from the more cartoon-like dorsal-ventral wave characters above. My teaching experience strongly supports the existence of the four postural plateaus suggested here.

One important aspect of the above discovery is that the frozen dorsal-ventral wave in people is, in fact, two complete wavelengths. In the illustration of the horizontal

"creatures" (Fig. 8), the first complete wavelength occurs entirely in what is earlier described as the director portion of the body and the second repeats itself throughout the rest of the body. This double wave, not easily recognizable in humans and many animals, could be partial explanation of how intentions or directions in the "director" section are transferred and carried out. This construct could provide a new view of how the face and body synchronize emotional expression. (8)

The "creatures" represent one of several ways to represent the four phases of a dorsal-ventral wave. They provide an explanation of how a given frozen postural predisposition in a person would affect the use of the eyes, ears, arms, legs, and so forth of a person. If an individual, for instance, seems not to be looking at anything in particular and might be described as a bit withdrawn, he or she may have characteristics consistent with the third and fourth characters (not including the top neutral template version). If an individual tends to look quite intently at things and other people, especially, he or she may have other characteristics consistent with the first dorsal-ventral wave example.

To further describe how the postural types might be ascribed to individuals, if shoulders are somewhat tense and thrown back, that would be more common among the second type or, perhaps, the first type. People who tend to lock their knees backwards would more often be from the fourth type. People who turn their feet outward would more often be from the third type.

On a more emotional and personality response level, people of the first two types tend more often to be direct and appear overtly controlling in many interactions while people of the third and fourth type tend to appear more compliant or submissive, attempting to get what they desire in less direct ways. On a body energy level, people in the first and fourth categories tend to be more "jumpy" or "springy," while those in the second and third categories more often are "laid back." People in each of the types feel different strengths and weakness from their postural "inclinations."

The first and third categories and the second and fourth categories exhibit opposite tendencies. (Opposites frequently attract.) The illustration should be thought of as circular or four-cornered, since the last figure has some characteristics similar to the first. I wonder if this simple schema of facial and body characteristics could find any compatibility with research and suggested typologies of facial expression.

From the illustrated chart of a postural and personality typology above, many more inferences can be made. Concerning aches and pains, people who experience upper and mid-back discomfort or pain have a greater chance of being the first or second type. People who experience lower back pain are more frequently from the fourth category. People in the fourth and third categories can have an easier time hugging others. People in the second category, more easily than others, tend to be able to crouch down on their haunches. The system attempts to suggest that there are patterns of predispositions.

There are so many categories of phenomena that affect human life, such as the one just described, that patterns can be very hard to observe. In fact, if this paper were longer and the drawings were three dimensional, I would introduce what I consider to be predictable frozen lateral wave features with the frozen dorsal-ventral waves as well.

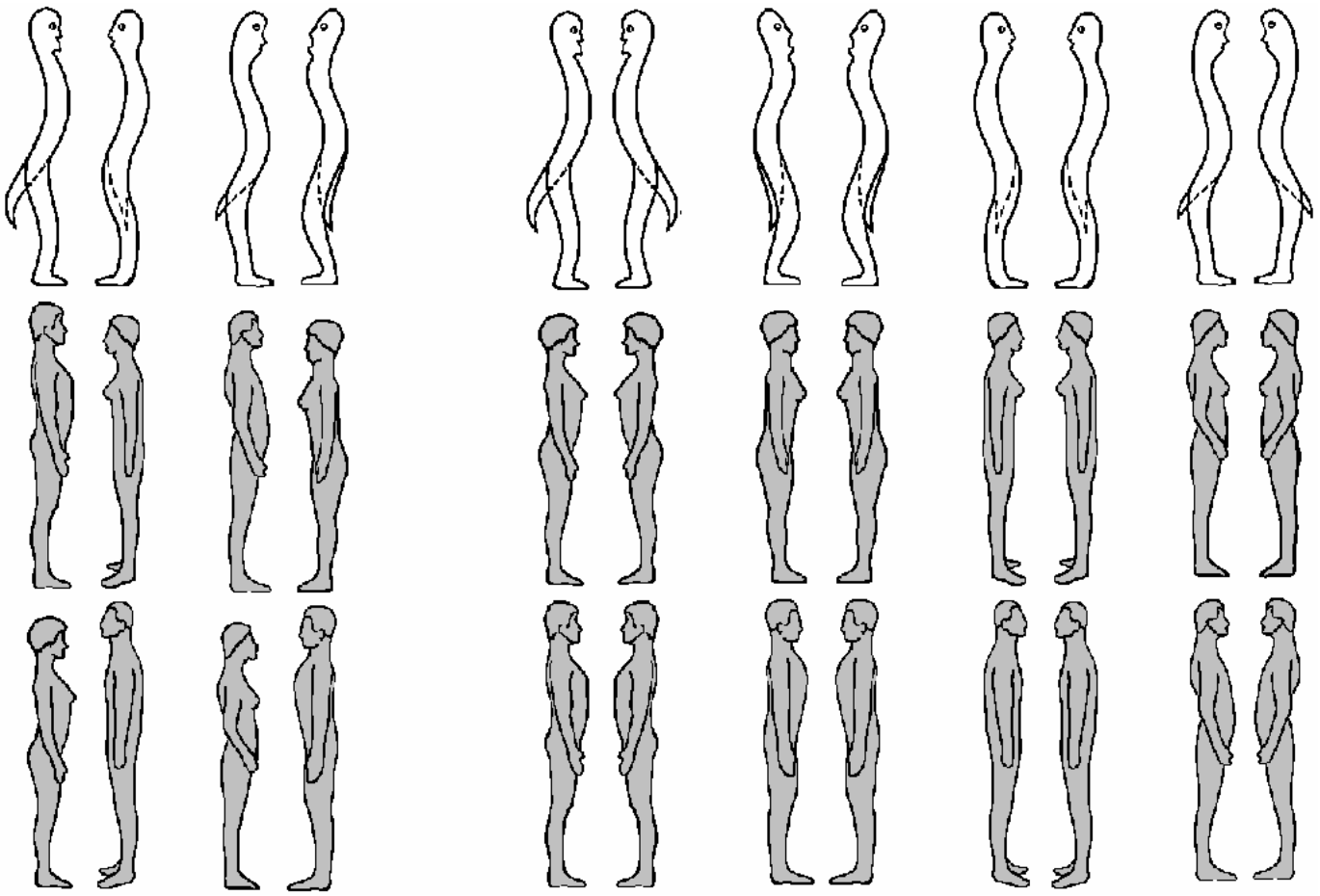

Figure 9 – Frozen dorsal-ventral waves "relating"

In figure 9, the emotional and personality aspects to these characters seem to show even more clearly. By observing both the cartoon-like and the more realistic figures facing each other in several of the many possible combinations, we may "see" various types of relationships. If you allow yourself to conjecture, playfully, on the nature of the various relationships, as we in fact do when observing others and "reading" cartoons, you have a good chance of having reactions to many of them. You may have guesses as to what their relationship would be if they were real and you may have even emotional reactions to or opinions about individuals or pairs.

Is it possible that the four wavy characters can be associated with inclinations to expose and hide different basic emotions? The thinking and appropriate illustrations for this area of conjecture, unfortunately, requires much more space to explain and elaborate. However, since a picture is said to be worth a thousand words, perhaps the illustrations in this paper make up for the incompleteness in the text.

I hope that new analytic thoughts and endeavors are encouraged by this writing and that what to some may seem pure fantasy is researched and tested for its veracity.

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