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Phase Transitions in Psychoemotional Development

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Abstract. 1. Figure-ground distinction can be observed not only in perceptual (i.e., apparently physical), but also in emotional (i.e., apparently psychical) phenomena. 2. Self and Other are primarily emotional complexes. 3. Both of them can be experienced in a figure-like, but also in an background-like ("medial") state. 4. The phases of psychoemotional development postulated by psychoanalysts can be reinterpreted as being steps in a transition of Self and Other from a medial into a figural state. 5. This succession has the properties of a synergetic process, with "autonomy claim", a construct introduced in the framework of the "Zürich model of social motivation", acting as a control parameter.

1. The Problem of Developmental Phases

During the first half of our century, psychologists used to conceive of child development in terms of more or less articulate phases. Typical for this approach was the doctrine of Sigmund FREUD, who divided psychoemotional development into an "oral", an "anal", and a "genital" phase. A mysterious general drive energy, called "libido", was thought to float through the body and concentrate, in turns, first in the mouth region, then in the rectal zone, and finally in the genitals. Once having arrived at this ultimate destination, genital libido was believed to seek its first external object in the other-sexed parent. Jealousy and hatred would then be directed against the same-sexed parent, who, in turn, threatened to castrate his infantile rival. That's why the "genital" phase was also labelled "oedipal".

There were other, and less fanciful, phase doctrines in developmental psychology, to be sure. Nevertheless, under the influence of classical behaviorism, the idea of developmental phases got altogether into a bad reputation. Development was now regarded as a continuous flow, proceeding in infinitesimally small learning steps without any breaks or cuts. Phase doctrines were suspiciously reeking of maturation, and to believe in maturation was felt to be nativistic and Aristotelian.

Psychoanalysts did not bother about this too much, mainly since they did not take notice of the goings on in academic psychology, anyway. Somehow they were well advised to do so, for thus their theory survived the behavioristic ice-age without unnecessary deformation.

Meanwhile, synergetics has imparted new actuality to the concept of phase transitions. Message has not yet got around to developmental psychologists, let alone, psychoanalysts. But it is well conceivable that synergetics could provide theorizing in these areas with new paradigms and help to better elaborate whatever is true in FREUD's ideas - since, after all, these ideas seem to have some heuristic value in clinical casework.

2. Some Considerations concerning the Phenomenology of Emotions

The contents of our immediate perceptual awareness, frequently summarized as the "phenomenal world", are not a mere facsimile of the stimulus manifold, but rather a product

of information processing activities going on in our perceptual system. Gestalt psychologists have contributed substantially to clarifying the principles and categories according to which our phenomenal world is generated. Among the most thoroughly investigated categories of this kind is the distinction of "figure" and "background", or rather, "figure" and "medium", as I shall prefer to say. Let us for a moment recapitulate the phenomenology of these perceptual categories.

1. Figures, and they alone, have *boundaries*. Boundaries don't punch holes into the background. Since it is the boundaries which determine shape and character, only figures possess an individual physiognomy. The medium remains amorphous, inconspicuous, unbounded, and unfathomable.

2. The medium is *invariant*. It controls the zero level of adaptation. Conspicuous changes of the medium as a whole question for a moment its medial state since they, as it were, lift its incognito. Normally (like, e.g., in the case of gradually changing background illumination) they escape our attention since we quickly habituate to them.

3. Notwithstanding its apparent neutrality, the medium is highly *influential*. It strongly effects the appearance of the figures embedded in it. A single candle hardly noticed in full daylight turns bright and shining at dusk. Unlike the interaction between figures, which falls under the category of apparent causality and is therefore perceived as arbitrary and fallible (like, e.g., a football missing the goal) the medial frame of reference acts like a fate inescapably imposed on the figures according to an obscure law.

All this is well known as far as the perception of *physical* objects is concerned. But, as again Gestalt theorists have emphasized [1], our perceptual world contains not only apparently physical phenomena (like, say, the temperature in a given room), but also the so-called "tertiary qualities", i.e., apparently *psychical* or, more specifically, *emotional* phenomena (like a relaxed, or hostile, social "atmosphere" in that room).

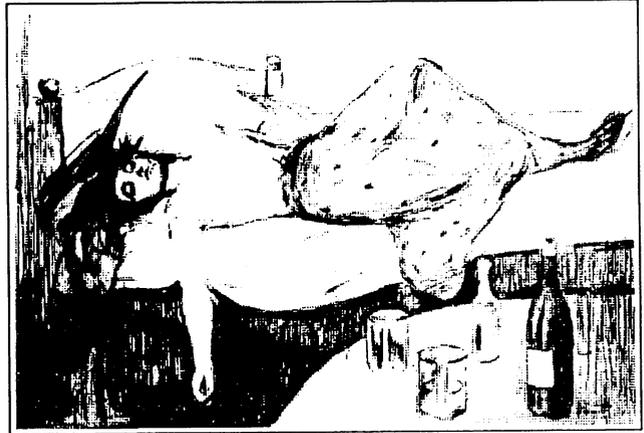
Figure-ground distinction, though having been studied in physical phenomena only, does apply to emotional phenomena as well. It relates roughly to the distinction made in German between "Stimmung" ("mood" or "atmosphere") and "Gefühl" ("feeling").

Moods and atmospheres are background emotions, i.e., media without a clearcut contour, impressions which shed a particular psychic coloring onto the whole phenomenal world. The woodcut of Edvard MUNCH shown in Fig 1 a, called "the cry", may serve as an illustration. It reflects the state of an observer who is confronted with the anxiety and despair of the depicted person, the impression being so overwhelming that it irradiates and fills the whole range of the observer's phenomenal world. He gets engulfed by this omnipresent *medium* of panic and starts feeling anxious for himself.

Quite different from such an effect of "emotional contagion" is the message conveyed by another example of MUNCH's art work (Fig. 1 b), called "the day after". Here the other person's emotional state is perceived in a *figural* condition. We readily sense that blend of doom, exhaustion, triumph, and certitude of having passed over the point of no return. But all these feelings are kept confined to this other person lying on the bed over there; they remain being her business alone. Like in the case of emotional contagion, it is my, the observer's, brain in which this impression is generated. But still, I experience it as somebody else's feeling, sharply distinct from the rest of the emotional coloring of my phenomenal world. This form of emotional transfer is known under the label of "empathy" [2].

In still another one of the same artist's lithographies (Fig. 2), carrying the title "jealousy", we are presented with an emotional *figure-ground distinction*: The feeling of jealousy is concentrated on and confined to the self-conscious Ego in the foreground, clearly set off against the medium of erotic heat emanating from the couple in the backscene.

Both myself and another person may hence be present in my phenomenal world not only as a physical body, but also as an emotional complex. And both can be experienced as a figure, or as a medium. When psychoanalysts make a distinction between "the Ego" and "the



a

b

Fig. 1. Emotional contagion vs. empathy: Graphic art by Edvard Munch. (a) "The cry". Lithography. (b) "The day after". Dry-point etching.



Fig. 2. Emotional figure-ground distinction. Edvard Munch: "Jealousy". Lithography.

Id", or when William JAMES [3] differentiates between "Me" and "I", they refer basically to the figural and medial aggregate state of my own psychical Ego as a phenomenal reality.

The same distinction applies to the appearance of the phenomenal You. We may experience another person as an individual partner, but he may also appear as a personally irrelevant agent of a boundless and anonymous social power. One may come across marriages in which one person floats in his partner like an embryo in its uterus, or which fail, since the partner for understandable reasons refuses to participate in this game.

Psychotic persons suffering from a pathological weakness of Ego boundaries may express this engulfment by a parental medium quite directly in their graphic products, like this Swiss schizophrenic patient who portrayed William Tell and his son (Fig. 3).



Fig. 3. "Guillaume Tell". Series of four drawings by a schizophrenic patient with persecution paranoia. From [4].

As indicated by the last example, it is particularly the parents who lend themselves to being perceived as emotional media. In infancy and earlier childhood, this is by no means a pathological phenomenon, as we shall see in a moment. First of all, however, we ought to concretize the implications of our terminology. When translated into the emotional realm, particularly into the emotional appearance of the parents, the three distinctions of figure and medium listed at the beginning of this paragraph have the following analogues.

1. Parents in a medial state have no proper name, they are *anonymous*, like Daddy, Mom, or God. Their existence is an absolute matter of course, without contingency, particularity, and distance. They have no individual character, since this would imply their being in a way one-sided. They are just perfect.

2. The parental medium is devoid of a personal biography; it is *ahistoric*. It has never been in the making, nor will it ever change. "I am who I am", says Jahwe. Old photographs showing that the parents were children themselves, that they had their youthful years in which they met and fell in love, may therefore have a disquieting effect on children who still require a parental medium.

3. Whatever medial parents do is bound to be *meaningful*. They are omnipotent, omnipresent, and omniscient, and therefore do nothing inadvertently or at random. Their influence is silent and inescapable.

The same three points apply also to the appearance of one's own Self.

1. As a medium, my Ego is *unconscious of itself*, it cannot be reflected upon. It has, in the Chinese sense, no "face" to lose. What my mirror image bears witness to is always my figural Self whereas, as a medium, I am the boundless substrate and theater of my entire world. Psychologically, Adam and the Paradise are one and the same.

2. The medial Self is simply *present*. Its existence does not project itself into the future, nor does it carry responsibilities out of the past. Eternal life is among the privileges of Paradise.

3. My medial Self behaves out of intrinsic *necessity*, not according to plans and arbitrary volition. It acts according to the "primary process", as expressed in psychoanalytic terms. The experience of one's own free will is an equivalent to figural Ego boundaries.

So much for this distinction. I have discussed it rather extensively, since the transition of "Self" and "Other" experience from a medial into a figural state plays an important role in psychoemotional development and may be a suitable basis for a reinterpretation of FREUD's phase doctrine.

3. A reinterpretation of Freud's phase doctrine

3.1 "Oral" phase

There are many indications that during the first year of life, in FREUD's "oral phase", neither father nor mother nor the infant's own Self are articulate emotional figures. All three are still ubiquitous media, merging into a virtually homogeneous atmosphere.

Child psychoanalysts speak of this state as a "symbiosis" between infant and parents [5]. Some go so far as to even deny the infant's ability to distinguish "physically" between his own body and the body of his mother. This is doubtful, however, since the infant could hardly survive such a gross perceptual illusion. The point at issue is not the physical appearance of mother and father, but rather the parental, caregiving *atmosphere* which is not yet confined to the parents' bodies but exists as a kind of force field filling the whole phenomenal world whenever the parents are physically present.

Likewise, the Self's own body and his limbs are, *physically*, perceived as figures. But at the same time, the Self is *emotionally* omnipresent; the things encountered have a physiognomy of belonging-to-myself, relating-to-me, existing-for-my-sake, I am the rationale of their presence. Like the Brahmans say: "Tat tvam asi" - all that lies out there is Yourself: wherever you turn, you encounter your own traces. This Ego atmosphere merges with the parental medium, and their totality fills the world to the horizon.

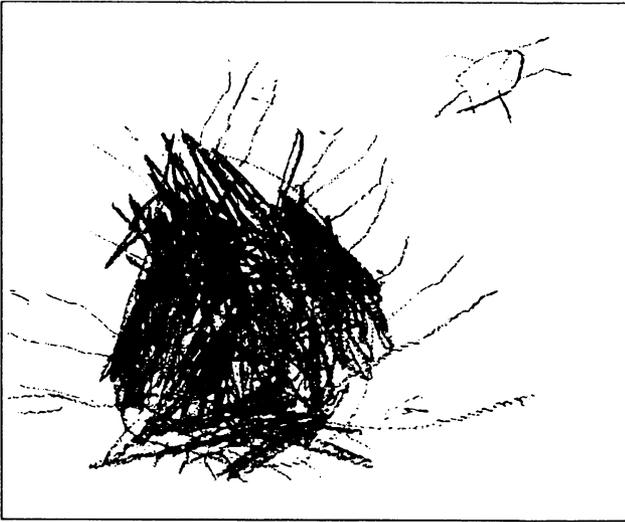
3.2 "Anal" phase

Around the age of 18 months this idyllic scenario changes substantially. Now the Self condenses to a figure. The infant is now capable of recognizing himself in the mirror, whereas previously his mirror image had just appeared as a playmate [2]. The marginal contrast between the newly emerged figural Ego and the surrounding social medium is frequently expressed by obstinacy and tantrums of negativism. World experience is now no longer symbiotic, however still egocentric. FREUD had called this age the "anal" phase, which is, in a way, symbolically correct since the sphincter's function is indeed to prevent uncontrolled passing of substance beyond the organism's boundaries.

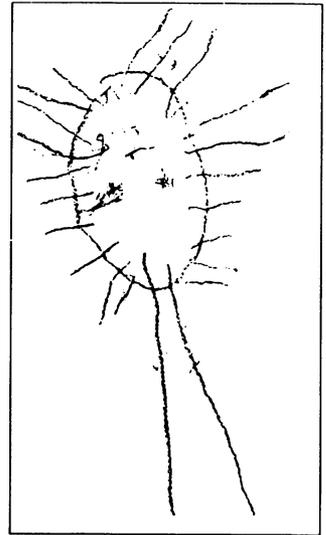
The birth of Ego as a figure is reflected in *children's drawings*. Originally, an infant's scribbling with pencil or crayon is a mere motor performance. But after about 2 years of age the control of drawing activity is taken over by the intention to produce a permanent trace on the paper. And the first form thus created is, as a cross-cultural universal, a closed boundary or a circular concretion.

Boundaries protect a figure from being engulfed by the medium. At the same time, however, they constrict and isolate the figure. In children's drawings, the closed circle is therefore usually complemented by a corona of tentacles or antennae which, as it were, establish contact with the environment (Fig. 4). Experts call this kind of figure the "sensitive globe" [6] and assume it to reflect the child's way of experiencing his own Self - not so much his physical body, but rather his emotional Self, as we may add in keeping with the specifications introduced above.

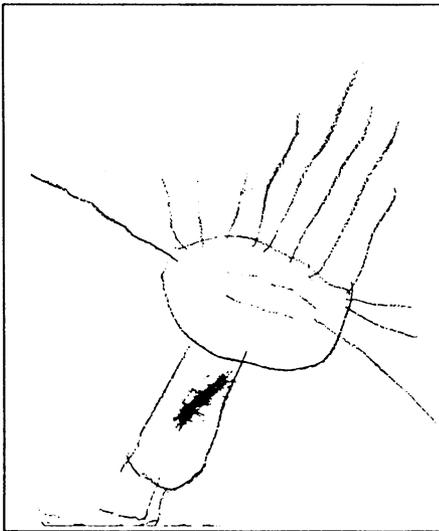
Sooner or later, the circle obtains a face, and the halo of tentacles differentiates into extremities. The form thus emerging is called "Kopffüßler" (cephalopode) in German, with reference to the arms and legs being normally attached directly to the head. In rare cases a trunk is already present, but if so, it forms just an appendix, without expelling the head from its centric position. In English, the same figure is called "tadpole", which alludes to its second important property, namely, to swim or hover in an indifferent equilibrium, without being subject to the pull of gravity.



a



b



c



d

Fig. 4. Earliest forms of self representation. (a) "Sensitive globe": concretion with tentacles. (b) "Sensitive globe", circle with beginning differentiation of face and feet. (c) "Sensitive globe", transition to "tadpole": Differentiation of arms, hairs(?), and even trunk. All three drawings by same Girl, aged 3; 2 [years;months]. (d) "tadpole". Same girl, 3; 8.

3.3 "Oedipal" phase

Around the fifth year of life, the appearance of children's drawings changes again. Two properties are characteristic of the graphic style now evolving (cf. Fig. 5 b): Firstly, the head has to yield its hitherto central position to a trunk. Secondly, the figure is now incorporated into a spatial frame of reference. The cephalopod has "landed", as child psychologists use to say [6].

Of particular interest are the vertical bars at the right and left margin of Fig. 5b. From a comparative perspective, these lateral structures turn out to be quite typical. Frequently they are interpreted as being of semi-medial nature like, e.g., curtains or mountains (Fig. 6).

The psychological meaning of the lateral structures is suggested by Fig. 7 b: They are the individualized residuals of the formerly homogeneous parental medium, which is now sensed to be torn asunder.

During nondirective painting sessions offered by special studios as psychotherapeutic or relaxation programs, elder children, and even adults, readily regress to these early motives. Once they are capable of graphically expressing emotional qualities in their drawings, child-

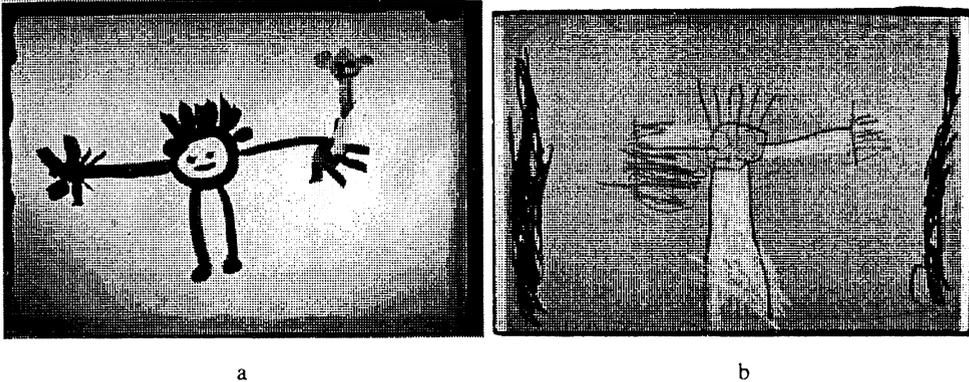


Fig. 5. (a) "Tadpole", drawn with head still in central position, but beginning awareness of spatial frame of reference. Girl, 3;10 (by courtesy of Malatelier Verena Lunin, Zürich). (b) "Landed" human figure, with excentric head and clear spatial orientation. Girl 4;0.

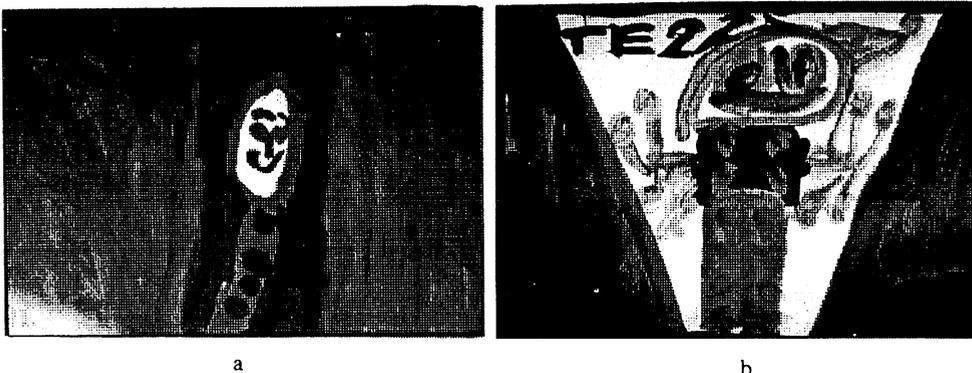


Fig. 6. Drawings with horizontal tripartition, spontaneously created in a free painting studio. (By courtesy of Malatelier Verena Lunin, Zürich). (a) Girl 4;8. (b) Girl 5;2.

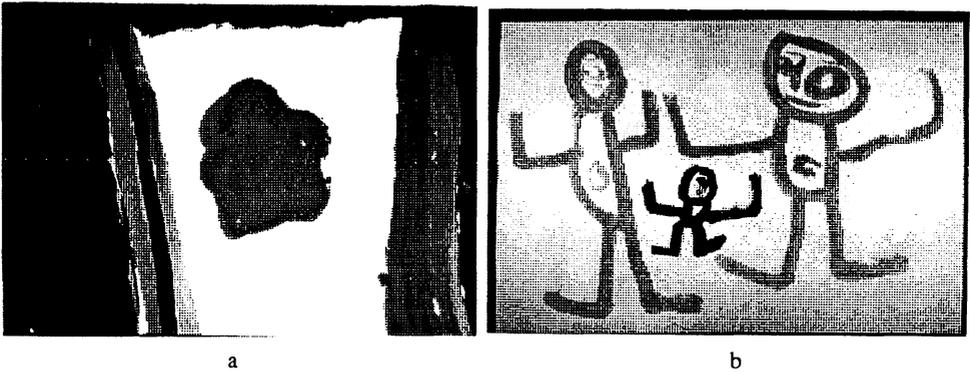


Fig. 7. Psychological meaning of graphic tripartition: (a) hidden behind symbolic abstraction (Girl 4;9); (b) explicitly portrayed (Girl 4;10). By courtesy of Malatelier Verena Lunin, Zürich.

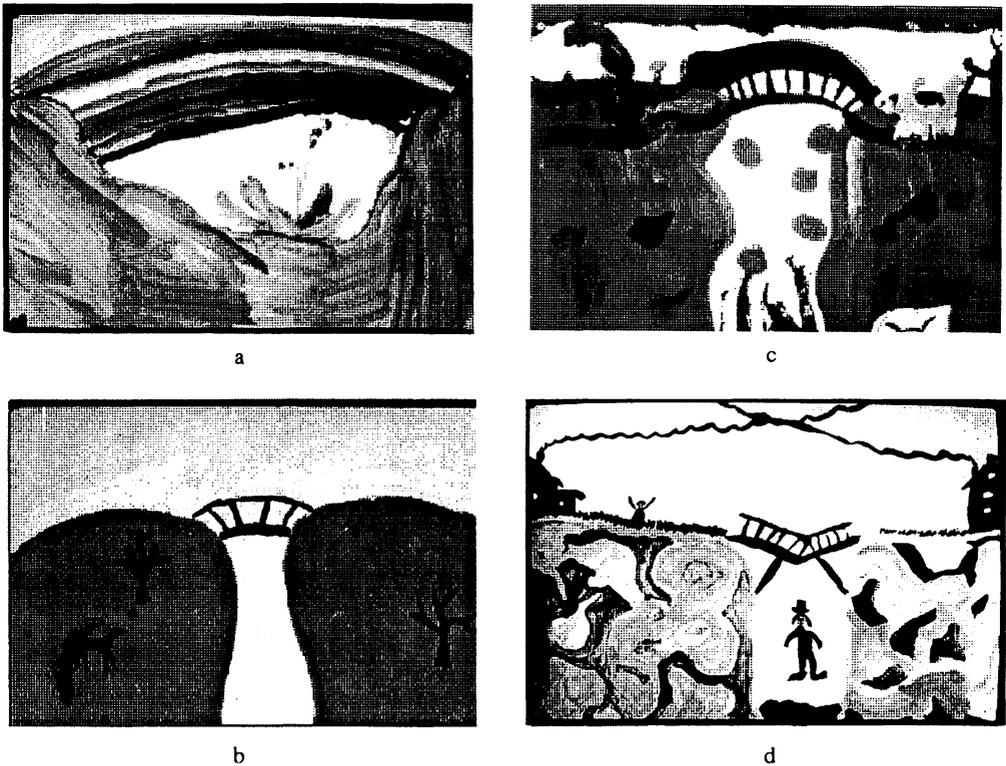


Fig. 8. Recapitulation of horizontally tripartite structure in children during "latency" period, with idyllic or ominous appeal. (a) Girl 7;5. (b) Girl 11;1. (c) Boy 10;3. (d) Boy 9;11. (By courtesy of Malatelier Verena Lunin, Zürich).

ren endow tripartite pictures occasionally with an idyllic, but usually with an ominous, disquieting atmosphere. The cleavage between the two lateral masses has to be bridged, and the bridging may be fragile and treacherous (Fig. 8).

Sigmund FREUD has assigned "oedipal" incest wishes to the developmental age in which this type of drawings commence to crop up. The empirical evidence is, however, more in fa-

vor of another interpretation. Whereas in the first two stages the phenomenal world remained emotionally embedded in undivided parental omnipresence, now in the so-called "oedipal" phase the two components of the parental medium segregate. With the discovery that the world has broken in two genders, and that even father and mother are substantially different in this respect, the parental medium loses its quality of being an unquestionable warrant of security.

It should be noted that the primal medium, though physically anchored in both parents, was basically *maternal* in quality: Mom and dad may have exhibited different styles in handling the infant, but basically they were both busy "mothering" him or her. So, when the medium breaks, its female half remains what it used to be, namely, maternal. Due to the reduction incurred, however, it is no longer omnipotent. The blame can easily be put on the other half who now appears as an alien intruder. Especially girls should be inclined to look at it this way, trying to maintain the illusion of still living in an unimpaired matriarchal paradise, and to extrude father as an unwanted troublemaker. This loophole is not accessible for boys who, driven by identification with their father, are forced to follow him into his exile and therefore sense the decomposition of the medium much more dramatically.

One of my doctoral students, Maria Teresa DIEZ, has investigated these processes more thoroughly [7]. She conducted individual experiments with 92 children of both sexes in an age range from 2;9 to 8;0. Their task was to play with a kind of dolls' house inhabited by teddy bears. The bears were made available in two sizes (adults and children) and also in two colors (brown and black). The Subjects were free to choose their dramatis personae, and to create the scenario. Usually, they played family scenes including one or both parental figures.

After the play session, the Experimenter inquired her Subjects as to which of the figures were particularly "dear" and "nice", and which ones were less likeable. Frequently the Subjects favored one or both parental figures. As Fig. 9 indicates there is in fact a sharp break in parental preference around the age of four, i.e., at the time postulated by FREUD to be the on-

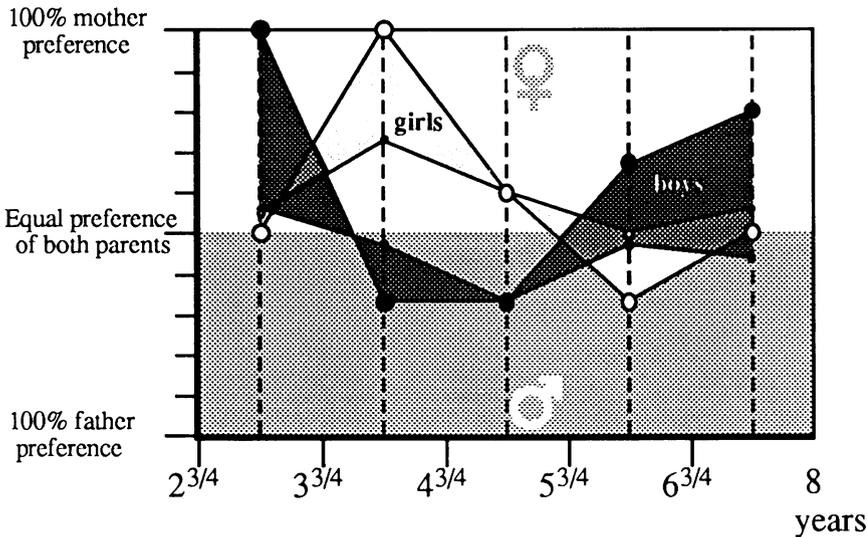


Fig. 9. Ratio of preference for parental figures in individual "bear house" play sessions with 46 boys and 46 girls. *Abscissa*: Subjects' age, grouped in one-year intervals (except in highest age group). *Ordinate*: Preference ratio of parents. *Empty dots*: Female Subjects. *Black dots*: Male Subjects. *Large dots*: Relative frequency of mother or father being named as "dearest" figure. *Small dots*: Relative infrequency of mother or father being impersonated by black figure or left out altogether.

set of the "oedipal" phase. In the second age class, girls name exclusively their mother as being "dearest"; not a single case of father preference was recorded, not even in combination with mother. Boys of the same age, in contrast, prefer the paternal figure, albeit less exclusively so.

According to FREUD's classical theory just the opposite result would have been expected. Psychoanalysts may entertain the suspicion that the children's consciously expressed preferences were but compensatory. This interpretation seems doubtful, however, in the light of another effect shown by the curves with small dots. Here the *rejection* of a parent was used to compute a preference ratio, rejection being scored if the parent was impersonated by a black figure, or was omitted altogether. The effect is less drastic, but shows the same tendency as the manifest preference choices.

4. Mythological parallels

Occasionally, the tripartition of "oedipal" children's drawings is not horizontal, but vertical (Fig.10), with the two fragments of the broken medium appearing in the guise of Heaven and Earth. It is worth while considering that the same topic is also encountered as a recurrent motive in comparative mythology.

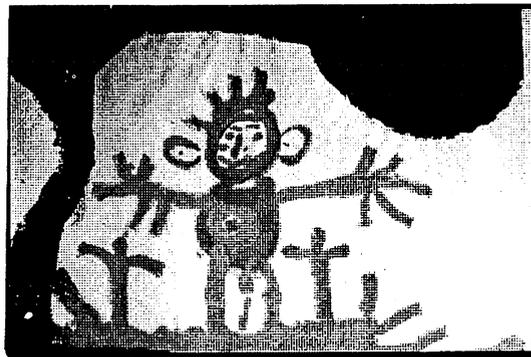
Many myths deal with the origin of "the" world. Apart from some fundamentalists, however, nobody would still expect them to contribute to our knowledge about the making of the physical cosmos. Oddly enough, we continue to assign a deeper meaning to them. This puzzle can readily be solved if we realize that the truth of creation myths is not a cosmogonic, but an ontogenetic one: They may have been *meant* to explain the origin of *physical* nature; but they derive their intuitive plausibility from their being a reminiscence of developmental stages of the *phenomenal* world in the consciousness of the maturing child.

The "oral" fusion of all psychic media is mirrored in myth by the motive of a primal ocean filling the whole world. When time is ripe, out of this ocean a first figure emerges - an island, a plant sprout, or a golden egg layed by a bird on the water surface. The parallel to the first appearance of the "sensitive globe" in children's drawings of the "anal" phase is quite suggestive.

Particularly conspicuous is the mythological equivalent of the "oedipal" phase: It is the widespread story of the separation of Heaven and Earth (Fig. 11). Similarly, in one of the



a



b

Fig. 10. Vertical tripartition. (a) Girl 4;5. (b) Boy 5;1 (from [6]).

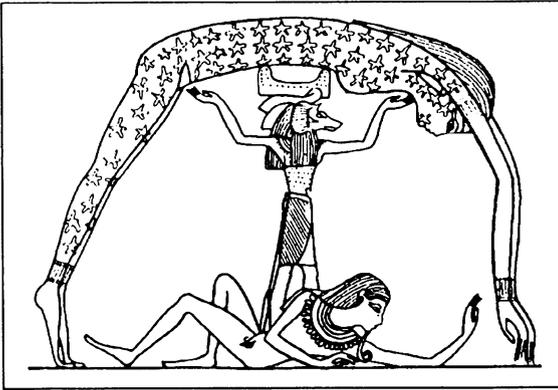


Fig. 11. Separation of heaven goddess Nut and earth god Geb by air god Shu in Egyptian mythology.

two creation myths of the Bible, Elohim separates the "upper" and the "lower waters". Frequently, the separation follows an initial stage in which Heaven and Earth embrace each other in a primal coitus, or are connected by an umbilical cord, the rainbow (cf. also Fig. 8 a!), or a ladder.

In her work with "oedipal" children Maria Teresa DIEZ has also addressed the question how her Subjects would respond to the mythological motif just mentioned. She presented them with two semi-elliptic plates painted as a blue sky with white clouds, or a grass meadow with flowers, respectively, and watched the children spontaneously attach these figures, plus a little ladder, to a magnetic blackboard.

The distance in which the two plates were arranged by the children is markedly age-dependent, as shown in Fig. 12. In the youngest age group both sexes tend to bring heaven and earth into close contact. But already in the second age group the boys make an impressive spurt towards maximal distance. The girls seem to conserve the illusion of an unbroken paradise for a somewhat longer period. Only at the age of 6 they can no longer evade the experience of medial segregation.

Additional information can be obtained from the way in which the Subjects spontaneously handled the ladder. Some used it to expressively bridge the gap between heaven and earth; others employed it only for plucking apples or some other earthly purpose, or left it aside altogether. The thin curves in Fig. 13 show the percentage of bridging-the-gap solutions produced by the children of the respective age groups. They may serve as a measure of the uncasiness generated by the separation.

After this initial exposition, the Experimenter rearranged the plates in a standard fashion with the ladder between heaven and earth, connecting both. Moreover, a set of little manlike figures were introduced under the name of "heaven people" (in blue) and "earth people" (in brown). The Subjects were then told the following story:

Once upon a time heaven and earth were still connected by a ladder. Heaven people and earth people could climb up and down, visit each other, dance together and have a good time. But then, one day, something happened. What, do you think, has occurred?

The stories thus elicited from the children could be grouped in three clusters, which correspond to the different shadings in Fig. 13.

First, there were stories with an undramatic content: It happens "nothing", or "something good", or "it rains", or all people assemble in heaven, or on earth, or return where they came from. This category is denoted as *harmony*.

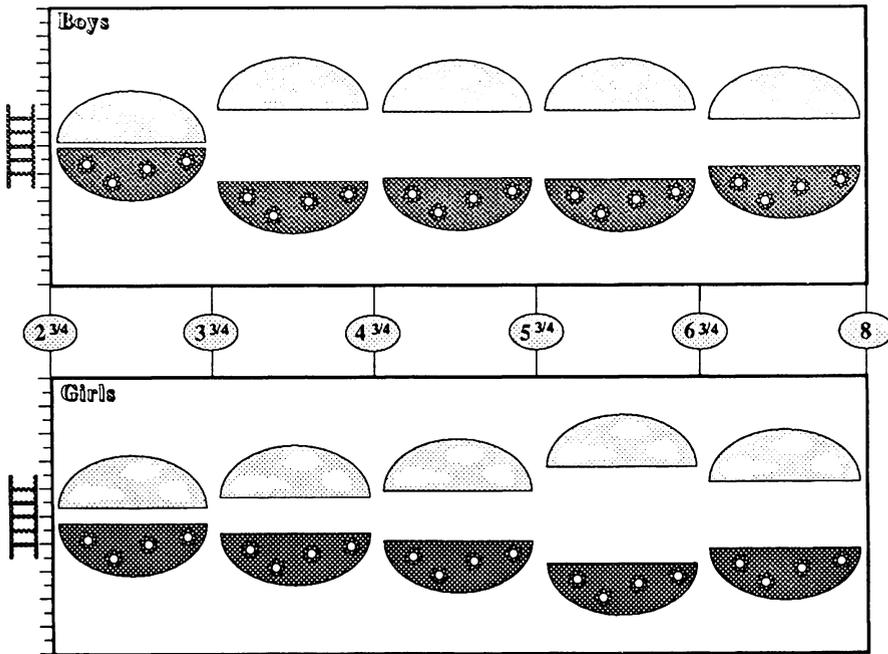


Fig. 12. Spontaneous arrangement of "heaven" and "earth" symbols on a magnetic board by 92 children aged 2;9 to 8;0. *Abscissa*: same as in Fig. 9. *Ordinate*: Mean distance of the two plates arranged by children of respective age group. Symbols are scaled down proportionally, with the size of the ladder (30 cm) on the left hand side as a basis of comparison. Ordinate scale: 5 cm.

Another category includes all solutions emphasizing a *separation* of heaven and earth. Some Subjects pronounce this quite directly, others talk about the ladder collapsing due to a storm, or to a quarrel between earth and heaven people. Or: Heaven people fall down to earth where they must stay against their will and may even get killed - or, vice versa, earth people are suffocated in heaven, or they are caught in heaven, since suddenly the earth disappears. Or heaven people and earth people permanently change their residence.

Responses which carried a sentiment of doom without, however, causally attributing it to heaven-earth polarization, were summarized under a third, intermediate category referred to as *chaotic*, not in the mathematical sense, to be sure. To this category belong, e.g.: Monsters devour earth people, or heaven people, or both. Or: Heaven and earth collapse. Or: Suddenly darkness closes in upon people preventing them from finding their way home, wherever they are.

The data suggest that in the male sex the "oedipal uneasiness" does indeed set in by way of a phase transition, and more or less accurately at the age postulated by FREUD. In girls, however, the process is much more attenuated and reaches its climax only at an age which FREUD, probably quite erroneously, has labelled the "latency period".

5. Psychoemotional development as a synergetic process

Summarizing the indications thus far collected, we may state that psychoemotional development in childhood seems in fact to proceed in a form which lends at least some intuitive appeal to FREUD's phase distinction. The psychoanalytic *interpretation* of these phases, however, requires a basic revision (cf. Fig. 14).

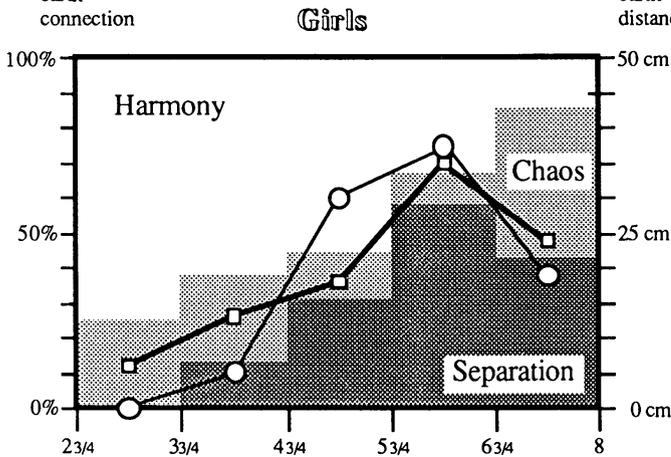
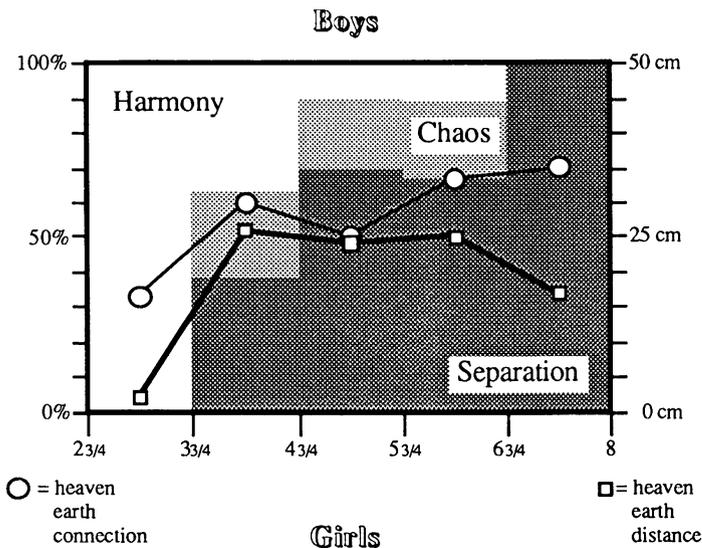


Fig. 13 Summary of results of Heaven-Earth experiment. *Abscissa*: Same as in previous figure. *Thin curves with round symbols (ordinate scale on left hand side)*: Percentage of instances where ladder was used to bridge the gap between Heaven and Earth. *Bold curves with square symbols (ordinate scale on right hand side)*: Heaven-Earth distance as shown in Fig. 12. *Shading (ordinate scale on left hand side)*: Percentage of "harmony", "chaos", and "separation" story endings proposed by the Subjects.

We propose to conceive of the "oral" phase as an age in which Ego quality and parental quality of the emotional atmosphere are still indistinguishable and strictly medial. In the "anal" phase the quality of Self, according to this view, condenses to a figural Ego which occupies the center of importance, still embedded in, but set off against, the primal medium. Finally, in the "oedipal" phase, this medium is disintegrated and, as it were, lateralized. At the same time, the Ego loses its centric position and discovers himself, and others like himself, to be one-sided entities of only relative importance, governed by higher order frames of reference.

Provided that this interpretation is valid we can now address the question whether the phase sequence outlined qualifies as a synergetic process. To begin with, we need to identify a control parameter responsible for the transitions described.

Again, a mythological finding can put us on the trace of a possible candidate for such a control parameter. There is a special class of myths which are structurally identical with heaven-earth separation stories, except that the motive of separation itself is replaced by the quite

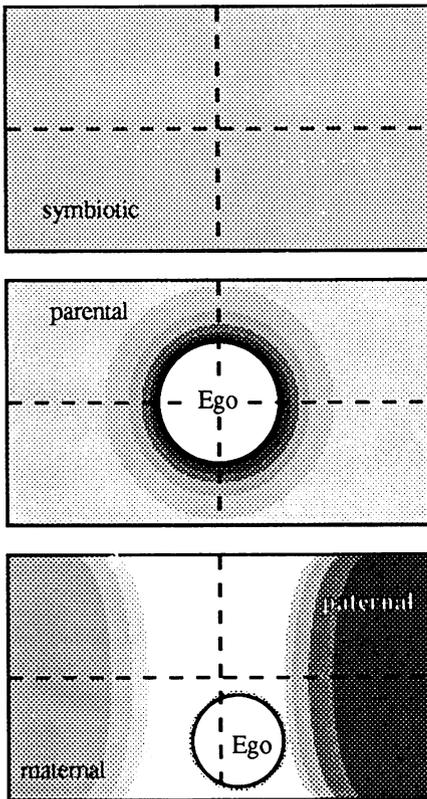


Fig. 14. Outline of proposed reinterpretation of Freud's developmental phase doctrine. *Above*: "Oral" situation. *Middle*: "Anal" situation. *Below*: "Oedipal" situation.

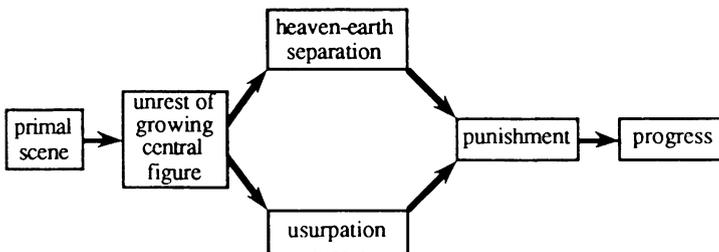


Fig. 15. Structural equivalence of separation and usurpation myths

different theme of a *usurpation*, of the illegal attempt to appropriate a divine privilege (Fig. 15). A classical example is the Jahwistic part of the Book of Genesis, the story of a father Jahwe who, in a primal scene with an equally preexisting mother Earth, begets the first Man, out of her mud and his spirit, then puts Adam into a paradise and vainly expects him to approve of himself being pampered and waiving forever the claim of autonomy and the competence to tell Good from Evil.

Elsewhere [8,9] I have pointed out that typical changes of social motivation occurring in child and juvenile development can be accounted for by a control mechanism which has been named the "Zürich model of social motivation" (cf. Fig. 16). Details can be found in the literature cited; suffice it here to say that the Zürich model is constructed around a central motivational construct, called *autonomy claim*, which refers to a person's demand to extend his sphere of influence. This motivational state is hypothesized to go along with a desire to

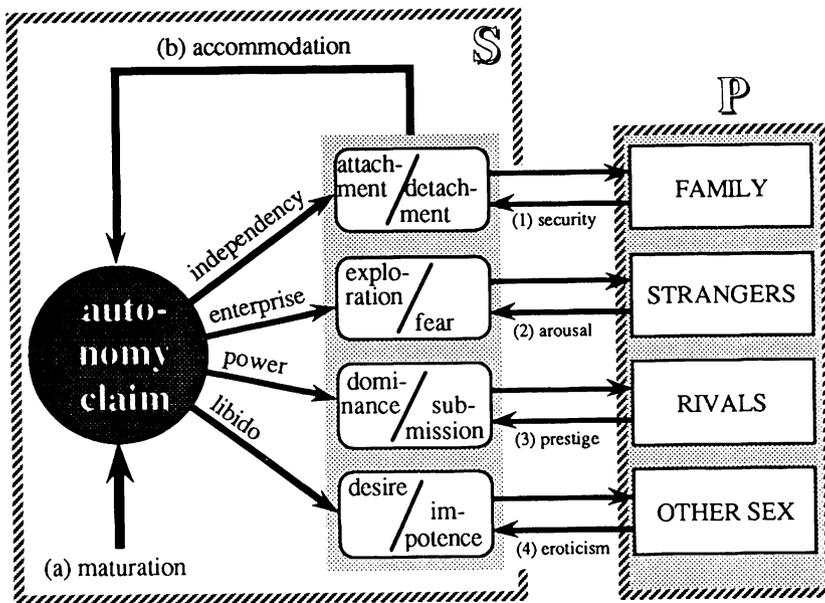


Fig. 16. Zürich model of social motivation (reduced version). *Right column:* Social partner (P), being mirrored emotionally as a potential source of (1) security (as far as partner is familiar or behaves predictably), (2) arousal (as far as partner is alien or behaves unpredictably), (3) prestige (as far as partner is rival), and (4) eroticism (as far as partner displays properties of other sex). *Middle column:* Subject's (S) motivational homeostasis in the four emotional dimensions named, depending both on deficit/excess of social input variable (1) to (4) and on four corresponding internal reference variables (viz., independency, enterprise, dominance wish and sexual libido). The latter are assumed to be corollaries of "autonomy claim", a motivational construct denoting the wish to acquire and maintain unrestricted control over the ongoing events in the subject's life space. Autonomy claim is thought to (a) gradually increase due to maturational processes, (b) acclimatize, via accommodational feedback, to the prevailing social situation which may require adaptive changes of the four reference variables.

be socially high-ranking, to be sexually successful, not to depend of the permanent presence of familiar caregivers, and to contact strangers.

Autonomy claim, as we assume, is low in early infancy and increases steadily towards a maximum in early adolescence, thus accounting for the juvenile's insubordination, his emigration from his family of origin, his growing social explorativity, and several other motivational changes occurring in child and juvenile development.

It should be well understood that the Zürich model presupposes a *continuous, unspecific* growth of autonomy claim. Nevertheless, if acting as a control parameter in a synergetic process, autonomy claim can be held responsible for phase transitions of the kind outlined at the beginning of this paragraph.

In order to construct such a process by way of computer simulation, we have to translate the emotional contents of "Self", "Mother", and "Father" into the simulation domain. This is done by representing them as three clouds graphically distinguished by different symbols. The symbols by themselves, to be sure, have no meaning; what counts is their *density*.

The simulation proper is based on three assumptions which are adapted from a similar model proposed by NAGASAWA [10] in a different problem context and mathematically interpreted not strictly synergetically, but in terms of a SCHRÖDINGER equation approach. According to these three assumptions we postulate:

(1) A *diffusion* process among all particles. When left to themselves they spread over the whole world theater. Bounded figural feelings, that is, tend to dissolve into atmospheric moods. We readily fail to understand the present annoyance of a partner to be his very private affair, confined to within his phenomenal boundaries. All too quickly we tend to take it personal, and let it grow into a paranoid impression of the "nobody loves me" kind.

(2) A *repulsion* tendency, rapidly decaying with distance, between unequal symbols. Emotional confusion due to different qualities merging in one is thus assumed to have a certain, albeit weak, inclination to clarify spontaneously.

(3) A uniform *attraction* exerted upon all particles by the center of the modelling space. This assumption refers to the control parameter which, in psychological terms, is identified with a gradually increasing claim to incorporate the emotional contents of the phenomenal world to within the Self's own reach. Autonomy claim, that is, attempts to usurp control not alone over one's own Ego, but over the entire emotional realm, including the parental force field. Mythologically, the illusion of being entitled to exert power even over the protecting parental medium is depicted as the Original Sin. We introduce this control parameter by way of defining polar coordinates in the modelling space and interpreting the radius vector of a given point in a symbol cloud as a measure of the degree to which the corresponding emotional content is felt to be under the Self's autonomous control. In the model domain, the wish to strengthen this control can then be interpreted as a uniform centripetal force field.

At the beginning of the process (cf. Fig. 17 a), the centripetal force is assumed to be of negligible magnitude. This is the stage of the primal ocean, mythologically speaking, or, in psychoanalytical terms, of early infantile symbiosis. The three symbol clouds still coexist in perfect mixture, provided the diffusion constant is sufficiently high as compared with the repelling forces between different symbols.

In the course of lifetime, the control parameter is then assumed to gradually increase. As can be seen in Fig. 17 this leads to conspicuous changes in symbol distribution. As a first step, one of the three clouds occupies the center and forces the two other ones to form a double ring. The model enters into the "anal" phase, as it were. Mythologically, the first island emerges from the primal ocean.

Which one of the three clouds makes it first to the center depends on the relative number of symbols per cloud. In the present example the rhomboid symbols outnumber the two other ones by a factor of ten to eight. This bias is already sufficiently strong to ascertain their centering priority. Strictly speaking, we thereby introduce a fourth assumption, which would psychologically correspond to the thesis that feeling oneself is slightly more intensive than feeling others.

In the subsequent stages of the process the two parental principles get increasingly segregated and take, like two crescents, the Ego figure between themselves. The breaking central symmetry is superseded by an axial symmetry, like in children's paintings the tadpole yields to the typical tripartite structures. In the mythological parallels, Heaven and Earth are separated. The model enters its "oedipal" phase.

Immediately following this tripartition the Ego is expelled from the center, or, mythologically speaking, from Paradise. He has coveted to engulf the whole world into his own range of power and is now punished by a loss of the hitherto warranted omnipotence illusion. In the field center, were the Self's power would be unrestricted, now yawns a vacuum. The Self painfully discovers that the parents are figures like himself, isolated entities with a personal destiny and private interests, rather than extended tools of his own desires. Even Ego himself is now realized to be partly heteronomous, since the other figures in his emotional space no longer allow him to return to the world's center. What occupies the center is, from now on, a black hole called Fate, an anonymous power that has all the protagonists in hand and is the true master of the World.

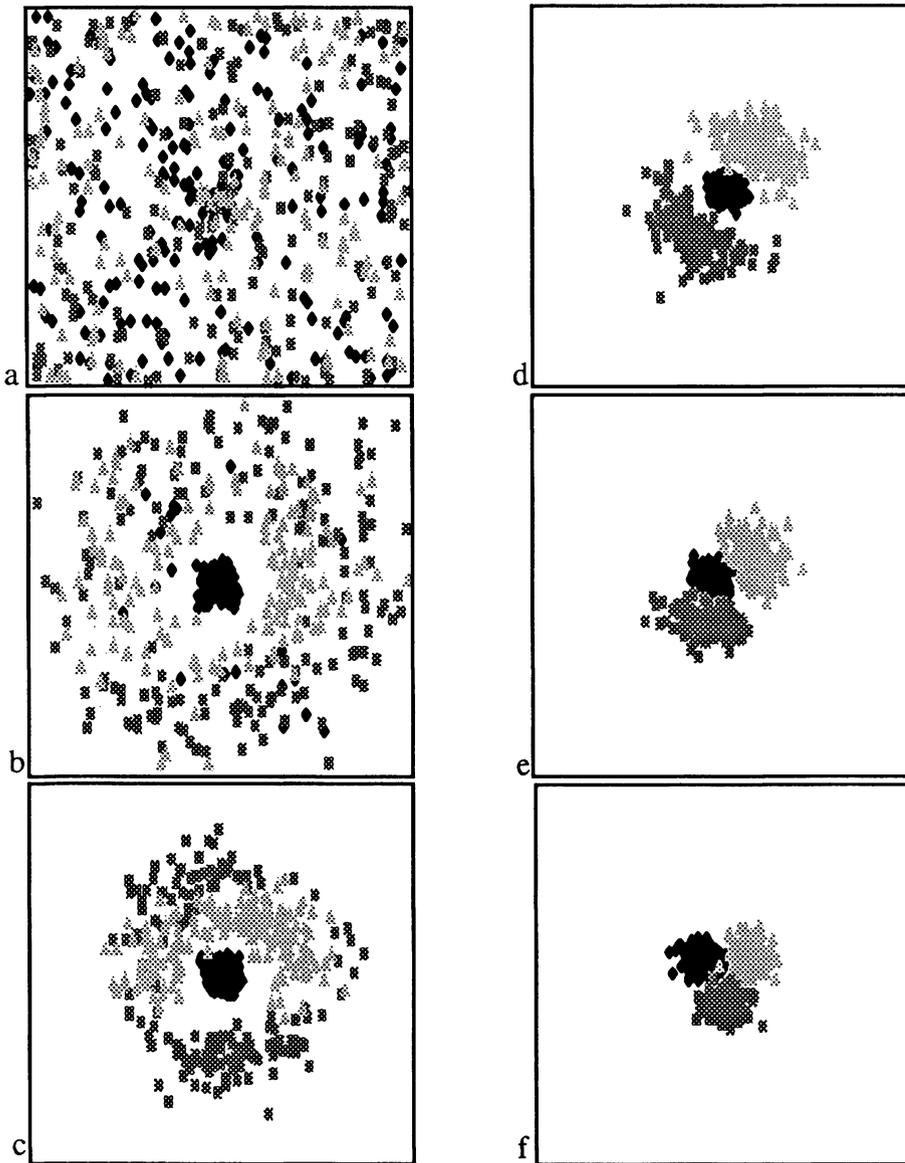


Fig. 17. Simulation of six subsequent stages of synergetic process described in text. *Model specification:* 200 Ego particles (dark rhomboid symbols), 160 particles of each parental quality (grey triangles or squares, respectively). Diffusion: Brownian movement of random magnitude between 0 and 16 units of length per time step. Repulsion between particles of different quality: Hyperbolically decaying, with maximum (between coincident particles) of .07 units of length per time step. Attraction toward field center: Uniform magnitude, gradually increasing from zero by .03 units of length per time step. In the six stages shown in the figure, magnitude of centripetal force is 3, 6, 9, 12, 15, 18 units of length per time step, respectively. Field size: 300 x 300 units of length. *Description of stages:* (a) Symbiotic mixture of all three qualities ("oral stage"), (b) Figural concentration of Ego in position of central importance, surrounded by still unsegregated parental media ("anal stage"). (c) Beginning segregation of parental media. (d) Climax of father-mother segregation ("oedipal stage"). (e) Beginning expulsion of Ego from centric position. (f) Decentered position of all three qualities.

6. Conclusion

I am probably not mistaken in supposing that, to some readers at least, the previous elaborations may sound a trifle too fanciful to deserve being discussed in a scientific context. One may be willing to concede that the idea of applying figure-ground distinction to the experience of Self and Other, unusual as it may sound to most psychologists, could possess some heuristic value in organizing a rather fuzzy area of phenomena. Also, the computer simulation presented is not particularly debatable in itself. The basic problem lies in the *combination* of both ideas. Is it not simply premature to engage in a play of analogies, as long as empirical knowledge in the field concerned is administered solely by poets and psychoanalysts?

Moreover, the analogy proposed covers only a few, albeit substantial, dimensions of the problem. The model predicts phase transitions of a gradually desintegrating mixture of mutually repulsive components during waxing concentration. It does not, for instance, account for the development of *boundaries* around figures, nor does it allow for a coexistence of figural and medial states of the same quality, and also the primarily maternal character of the symbiotic medium and the gender asymmetry resulting thereof is not taken into regard. All this, to be sure, could be accounted for, but then the model would lose its suggestive simplicity.

It is exactly this simplicity, on the other hand, which may after all speak in favor of the ideas presented. If a model rests on only few, rather unspecific premises and is, nevertheless, robustly capable of producing a typical variety of nontrivial effects, it deserves attention. The process could well be general enough to emerge in very different areas of our experience, including such which nobody would, on first guess, associate with differential equations or computer graphics.

For the time being, it may be worth while to explore even mere potentialities of self organization, just to make ourselves acquainted with the general typology of processes occurring in this realm, and to sharpen our sensitivity for cross-connections whose hidden regularity otherwise would have no chance of catching our attention.

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