

## OECOLOGICA HUMANA

**New Frontiers of Ecological Ethics — a Balance Between Over- and Under-Control of Outer and Inner Factors**

A vicious cycle is entangling man: As we fear to become controlled by our environment, we tend to become concerned in a generalized way with controlling environment-resistant (e-r) (grossly termed 'innate') factors. Such a control envisages manipulation even of *normal* genes, beginning with single trait genes, striving towards the manipulation of polygenic traits and ultimately towards the production of an exact gene copy of an individual in cloning, already accomplished in frogs. In humans, mainly because of technical difficulties, such controls of e-r factors focus at present especially on *normal neonatal* development with its e-r neuro-maturational sequences — especially those of the motor apparatus. With such attempts to control through new techniques the normal, so far e-r factors of human development, we are in danger of losing even more controls, as will be outlined in the following discussion. This new situation constitutes a new realm of ethical concern.

A point in case is PLATT's<sup>1</sup> view: 'The world has now become too dangerous for anything less than Utopia'. Based on such an attitude, PLATT goes on to envisage biogenetic engineering which would for instance eliminate 'things we now cut out... by surgery — the appendix, the tonsils'. In this line, PLATT envisages the possibility of a 'reshaping of the human organism, as we have been reshaping plant and animal organisms'. Thereby, PLATT hopes: 'man will cease to be at the mercy of the evolutionary... and... biological accidents'.

It would be in such a state of affairs that the vicious cycle could complete itself: a new type of fear of losing control would emerge around such questions as: Who will decide whether something is a negative or a positive evolutionary 'accident'? Who will control the controller? Who will be able to foresee the new man-made, only seemingly 'controlled' consequences on evolution? (Even as mundane a control as selective surgical removal of appendix and tonsils has been criticized already during our life time).

MISLIN<sup>2,3</sup>, who initiated ecological discussions in *Experientia*, raises pertinent questions about 'the irresponsible manipulation of life which is destroying the *natural* control of the processes of evolution'. He calls for a human ecological ethics which 'would integrate the outer environment and also the relationship between humans and the inner world of human beings.' I would not only join such a call but would like to specify it further in line with MISLIN's<sup>3</sup> emphasis on concrete situations.

Consider the present most acute potential danger of a 'controlling' attempt to interfere with the e-r neuro-developmental factors, of which the consequences are not yet sufficiently known. There are grossly four possibilities of such a manipulation: too early, too late, too little or too much environmental influence. Such a danger would be checked through neuro-psychiatric or neuro-psychologic knowledge. A concrete example of attempts at too early environmental influence on e-r factors are the 'walking' exercises in the newborn by ZELAZO et al.<sup>4,5</sup>. Characteristically, the 'walking-' and 'placing reflexes' were exercised (4 times daily in newborns from 1 week until about 8 weeks of age) in an attempt to control 'the subtle forces in society that erode the self-rewarding activities underlying the infant's curiosity<sup>4</sup>, and to correct 'out widespread belief in the invariance of the motor sequence'<sup>4</sup>.

For the sake of demonstration within the present context of environmental attempts to control e-r factors of normal neuro-development, there will be pointed out here only some aspects of this problem of 'neuro-ethics'<sup>6</sup>, which was discussed elsewhere<sup>6</sup>.

Let us recall that in the newborn and up to about 11 months of age, there is no *voluntary* walking neurologically possible, mainly because of the lack of myelination of the pyramidal tracts. In the newborn there are a misnamed 'walking' reflex (more precisely called 'stepping reflex') and a placing reflex. Since there is no posture neurologically possible yet at this age, 2 adults have to replace the missing posture during the systematic 'exercises' of these reflexes: one person supports the newborn by holding him under the axillae, tilts him and moves him forward, while the second adult stiffens the newborn's knees.

When such newborn 'walking exercises' were criticized<sup>6</sup>, a 'reply'<sup>7</sup> was given in which the essential neurological and ethical questions raised were by-passed and which appeared to have been colored by emotions. The protagonists<sup>7</sup> for newborn 'walking exercises' thereby appear to reveal a great force and urgency behind such a striving toward control, and go to great length in support of such control:

Out of the several neurological objections<sup>6</sup> to newborn 'walking exercises', the 'reply'<sup>7</sup> is addressed only to two minor points, and labels these as the only 'two theoretical objections' raised in the criticism<sup>6</sup>, thereby rationalizing the neglect to face the major points. This procedure<sup>7</sup> of elevating two minor notes to the status of the only 'two theoretical objections' of the criticism<sup>6</sup> has the additional advantage of now permitting a generalization of the supposedly found 'theoretical misinterpretations'<sup>7</sup> as being at the basis of the entire criticism<sup>6</sup>. However, it appears that the inappropriately generalized judgment of 'theoretical misinterpretations' is not even applicable to these two minor points — and obviously not to the many more major points, since these were not addressed. The minor ones are:

a) Too early toilet training was explicitly referred to as *analogous* to newborn 'walking exercises' and was only mentioned in a brief footnote<sup>6</sup>. Indeed, it is still debatable whether early toilet training prior to myelinization of the *voluntary motor component* of sphincter control is completely harmless.

b) 'reply'<sup>7</sup> refers to HELD's<sup>8</sup> *specific* experiment as not being applicable to the problem of newborn 'walking exercises'. The criticism<sup>6</sup> about them, however, explicitly referred to the *general principle* of re-afference, as discussed by HELD<sup>8</sup>. Moreover this was brought up in the context of discussing the principle of 'corollary discharge', which occurs whenever a voluntary movement is performed, not where there are passive or involuntary motions, e.g. reflex motions. Those 2 principles were cited together

<sup>1</sup> J. R. PLATT, *Science* 149, 607 (1965).

<sup>2</sup> H. MISLIN, *Experientia* 25, 224 (1969).

<sup>3</sup> H. MISLIN, *Experientia* 30, 1495 (1974).

<sup>4</sup> P. R. ZELAZO, N. A. ZELAZO and S. KOLB, *Science* 176, 314 (1972).

<sup>5</sup> P. R. ZELAZO, N. A. ZELAZO and S. KOLB, *Science* 177, 1058 (1972).

<sup>6</sup> A. A. PONTIUS, *Percept. Mot. Skills* 37, 235 (1973).

<sup>7</sup> P. R. ZELAZO, M. KONNER, S. KOLB and N. A. ZELAZO, *Percept. Mot. Skills* 39, 423 (1974).

<sup>8</sup> R. HELD, *Scient. Am.* 213, 84 (1965).

to emphasize the essential neurophysiological difference between performing voluntary motor actions and being in a state of involuntary motion, e.g. due to reflex stimulation, which also give a stereotyped quality to such involuntary motions.

Of KORNER and GROBSTEIN's<sup>9</sup> work only a non-essential part is quoted (holding the baby in the vertical position), while essential qualifying statements are omitted by ZELAZO et al.<sup>7</sup>: "Walking activity ... was prevented by the motor restraint imposed by being held to the shoulder ... resulting in the state of alert inactivity. In fact, by preventing the *distracting* effects of the infant's motor activity, the physical *restraint* may have enhanced the likelihood of alert behavior', according to KORNER and GROBSTEIN<sup>9</sup>. Such a situation constitutes an extreme opposite to the elicitation of stereotyped reflex motions, yet ZELAZO et al.<sup>7</sup> cite this in support of newborn 'walking' exercises!

Characteristically and in line with the present discussion about environmental interference with e-r factors, ZELAZO et al.<sup>4,7</sup> claim that ultimately the normal development of voluntary walking is accelerated in their 'exercized' newborns. However, ZELAZO et al.<sup>7</sup> state that the Babinsky reflex later disappeared in their 'exercized' Ss at a 'normal age'. This would in essence contradict ZELAZO's<sup>4</sup> claim that these Ss showed *precocious* 'instrumental control of walking'<sup>4</sup>. The Babinsky reflex disappears only with the maturation of the pyramidal tracts. The *normal* age for this to occur is only about 11 months of age. Had these 'exercized' Ss indeed showed *precocious* 'voluntary walking', their Babinsky reflex also would have to disappear *precociously* and not at a normal age! (There appears to be also wishful thinking at work in the parents of these 'exercized' Ss, of which over 80% claimed that their newborns 'smiled' during the 'walking'. However, the full open mouth smiling response occurs only as a rule very close to three months of age!)

In an attempt which appears to indicate that ZELAZO et al.<sup>7</sup> even strive ultimately to go beyond the control of 'walking' in the newborn (— if ever they could —), they further cite PIAGET's<sup>10,11</sup> theorizing about the develop-

ment of 'sensorimotor intelligence', where the infant's reflexes become gradually integrated into voluntary motor actions. Such an attempt<sup>7</sup>, however overlooks that PIAGET's<sup>10,11</sup> observations are only about reflexes of the *upper* part of the infant's body. This does not appear to be accidental, because its neurological substratum matures much earlier than that of the *legs*. Furthermore PIAGET<sup>10,11</sup> does not mention reflexes which served their main function during *intra-uterine* life, and which need external postural assistance for their elicitation post-natally. (A few months after birth the 'walking' reflex becomes suppressed through cortical inhibition. It had apparently served survival in utero by helping to bring the head into the vertex position<sup>12</sup>, the most propitious presentation to be born in.)

These researchers<sup>7</sup> in their quest 'to dispel the myths concerning motor development in infants'<sup>7</sup> are facile in attaching labels to the raising of neuro-ethical questions, which point to potential obstacles in their way: They even refute as 'poor data' questions raised on the basis of clinical (fortunately — at the present state of our knowledge in this area — *not* experimental) findings of detrimental effects of the use of 'baby-walkers' and 'baby-bouncers'<sup>13</sup> even in children older than newborn.

What could be at the basis of emotional judgements entering a discussion of the newborn's motor development? It appears that the positions of 'nativists' vs. 'environmentalists' tend to clash where the possibility of an integrated position is neglected: the acceptance of genetically programmed e-r *potentials*, which need to meet with environmental stimuli, usually around an *optimal* period of time, in order to become actualized.

Any environmental manipulation of e-r factors, in order not to be potentially harmful to the neurologically immature child, would have to take place only during optimal periods of time, e.g. when the neurological substratum has matured in an appropriate way to deal in an integrating manner with the environmental manipulation.

It seems ironical that those environmentalists, who apparently fear a limitation of their control if they would concede potentially 'innate' (more precisely: environment-resistant, e-r) factors, are the ones, who by attempting over-control, could actually lose control, because the consequences of such over-control are not known.

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<sup>9</sup> A. KORNER and R. GROBSTEIN, *Child Devel.* 37, 867 (1966).

<sup>10</sup> J. PIAGET, *The Origins of Intelligence in Children* (Int. University Press, New York 1952).

<sup>11</sup> J. PIAGET, *The Construction of Reality in the Child* (Basic Books, New York 1954).

<sup>12</sup> W. LANGREDER, *Dt. med. Wschr.* 74, 661 (1949).

<sup>13</sup> M. J. SIMPKISS and A. S. RAIKES, *Lancet* 7753, 747 (1972).

## CONGRESSUS

### Denmark

#### The 2nd International Symposium on Vascular Neuroeffector Mechanisms

in Odense, 29 July — 1 August 1975

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### Italy

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