

Human Biography And Its Genetic Instrument

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Abstract

The aim of this paper is to demonstrate the significance of some of the results of Rudolf Steiner's research for modern developments in genetics. The key concepts are: the etheric organism as the bearer of the laws and processes of inheritance; the metamorphosis of growth forces into those of thinking; the human "I" (self) as controller and modifier of genetic material and self-organization (molecular-Darwinism) seen anew in the light of anthroposophy.

Introduction

Human biography goes through characteristic stages in body, soul and spirit. At the physical level, active growth and development up to age 20 or 25 are followed by physiological functions continuing at the level reached until about 40 or 45, and then progressive involution and the physiological deterioration of old age to the end of life. Apart from this there are characteristic pathological processes, with acute febrile infectious diseases at their highest level in childhood, chronic diseases in old age, and psychosomatic conditions in mid-life. Compared to this, the human biography in soul and spirit shows remarkable differentiation. Childhood and youth show considerable differences depending on where a person grows up, what kind of schooling he or she has and where his or her interests lie. Choice of occupation and working life, the circumstances of private life-with or without family-all provide highly differentiated opportunities for learning and experience to further individual development.

Inheritance, Environment, and Individuality

One of the most interesting questions to have arisen-once the theories of evolution and heredity gained general acceptance in the 19th century-is how far human development and hence also biography are predetermined by genetic or environmental factors and by "personality" - a rather vague term - or the human "I" or ego. In their book *Separate Lives: Why Siblings Are So Different* (Dunn and Plomin, 1990), developmental psychologist Judy Dunn and behavioral geneticist Robert Plomin discuss that question in the light of their extensive researches. They analyzed research findings made in developmental psychology and behavioral genetics in recent decades and a large number of studies and surveys to come closer to an answer. A remarkable discovery they made is that similarity in terms of size, weight and disposition to diseases, for instance is rarely greater than 50% and generally well below this. Thus differences between siblings concerning distance between eyes, length and width of nose and length of ears is at around 30%. About 80% of all siblings have distinctly different eye colours. 90% differ in the colour and structure of their hair. The disposition for diseases such as gastric ulcer, hypertension, breast cancer, diabetes, childhood eczema and for asthma and hayfever is at less than 20%. These findings are not in accord with modern concepts of heredity, for it has been shown that surprisingly few behavior patterns can be ascribed to a single gene. It is generally the case that several genes are responsible for a particular characteristic, and it maybe a case of hundreds of genes each making a minor contribution to variability between individuals. The resulting genetic effects are called "additive effects." Non-additive effects arise when the influence of genes changes due to their particular position or even their mere presence, creating new characteristics that have not existed before.

Dunn and Plomin made use of the term "epistasis," originally introduced by biologist William Bateson in 1907 for such non-additive gene effects leading to the appearance of new, unexpected characteristics in individuals. They use the term for genetic effects which, being part of the interaction of genes, result in

spontaneous, unpredictable interrelationships in the highly complex dynamic network of genes. In their view it is also due to these effects of a higher order that even first degree relatives show less than half the similarities of identical twins. According to these theories, therefore, similarities between offspring are due to additive summation of numerous individual genetic effects, whereas differences between offspring are the result of epistasis, i.e. those effects of a higher order, causing non-additive and therefore unpredictable new characteristics. Environmental factors, often difficult to define but needing to be differentiated, also come into this. They, too, can mutually enhance, weaken or balance one another. Depending on their degree and quality they can change to genetic material of plants, animals and humans, and this means a further vast range of additions, interactions and potential enhancement, weakening or balancing out that cannot be individually predicted or indeed assessed. In a seemingly “chance” way, additive and epistatic effects in the genome combine with those due to environmental factors, proving “lucky” or “unlucky” in the spectrum of the individual’s gifts and limitations.

The question is, however, whether the terms “chance,” “luck,” or “bad luck” adequately define the principle according to which a combination of genes is selected when ovum and sperm fuse, then to be influenced by environmental factors with their innumerable additive and epistatic effects.

The question is taken to an even deeper level because Dunn and Plomin’s work has brought together masses of material that add individual relationships as a third key concept to those of heredity and environment. Analysis and systematic evaluation of numerous studies, including the study and comparison of many writers’ biographies and childhood memories, have shown that a child’s behavior is not solely determined by heredity and environment, but that it also depends to a major extent on the child itself, how it deals with the environment. The surprising result of these investigations has been that children themselves are remarkably selective in the attention and capacity for relationship they have for those environmental factors. The key aspect of potential environmental effects was always the existence and nature of individual relationships that really allowed the environment to have an influence, aspects that gain in power or lose significance for individual development. If heredity and environment were the only influential factors, siblings would show much more similar behavior than they actually do. The real situation is that siblings also differ because their relationships to one another and their parents are vastly different, shaping them individually. Relations with the same parents can be so radically different that an outsider hearing of them can only conclude these must be different people. The same mother may be seen as warm-hearted and protective by one child, and impatient and daunting by another (Dunn and Plomin, 1990). Irrespective of whether parents think they are essentially treating their children the same, or of their idea of preferential treatment or rejection, children are very accurate in saying how they do or did experience parental attitudes, and their perceptions will often differ greatly from those both of siblings and the parents themselves—they are highly individual.

Development and Cosmic Order

The hypothesis of chance as prime mover in development grows even more doubtful when we consider the numerous correspondences and connections human biography shows in relation to the evolution of the realms of nature and the situation of the whole cosmos. Human metabolism follows circadian rhythms which in turn depend on the sun’s orbit around the earth. Pregnancy is still counted in lunar months, embryonic development proceeding in characteristic weekly and 4-weekly stages, not to speak of the direct effect of the sun on the vitamin D precursor in human skin, for instance, and on photosynthesis in plants. In terms of space and of rhythmic time sequences, earth and cosmos are part of a finely attuned system of relationship; nothing drops out of this as being “meaningless.”

This goes so far that even orders of magnitude show exact correspondence. I once worked out where we would get to if we took the number steps in powers of ten into the universe that we need to take to come

to the smallest building stones of matter, which are in the range of 10^{-16} to 10^{-18} meters. 10^{-16} to 10^{-18} meters reflects the distance to the nearest fixed stars, e.g. Alpha Centauri.

To speak of chance when one knows of all these interactions and correspondences resulting from genetics, the influence of environmental factors and finally also the whole of nature and the cosmos around us, is to my mind to speak of a hypothesis that rests on extremely shaky foundations. I would therefore like to oppose this with another hypothesis that comes from Rudolf Steiner's science of the spirit. It says that human thinking is capable of more than discovering all the above relationships and correspondences and formulating laws of nature for all visible phenomena. Our thinking is the evolutive power that is active in the vast variety of species in the plant, animal and human worlds. Thinking activity itself is a power that has emancipated from natural processes and has independent, purely spiritual evolutive powers. This requires elucidation, and a brief outline is given below (Steiner and Wegman, 1925).

Comparison of Human and Animal Development

In the first place it is remarkable that compared to the different animal species, human beings are less specialized. Comparative study of human and mammalian embryonic development shows the morphology to be practically the same, phenomenologically speaking, in the early stages. Even a bird's wing looks like a human arm in the early stages of development, with five finger rays. This form is abandoned as development progresses, with the fingers growing stunted, fusing in some areas, and the central ray extending, finally producing the highly specialized skeleton of a flying creature. It can come as quite a shock to compare the head of a chimpanzee immediately before and after birth with that of a human baby. In form they are extraordinarily similar-small nose, bulging forehead, beautifully shaped back of the head. As the young chimpanzee develops, this vertical arrangement of the face is given up, projecting brows develop, the forehead slopes backwards and the back of the head loses its roundness. A characteristic ape's head results, with the facial part of the skull projecting (Poppelbaum, ii; Kipp, 1980).

Human beings retain their non-specialized body form for life. One cannot tell by looking at a human hand if it is about to caress, strike, raise a dagger or play the piano. No specific use has been laid down for it and direction has to be given to its actions by specific thoughts about what is to be done next. This phenomenon shows a radical difference between humans and animals, a difference not sufficiently regarded by biologists today. Human beings have to make up for their lack of bodily specialization, and the lack of instinct-guided behavior due to this, by using their intelligence. It means that animal intelligence is guided by body and instinct, so that animal behavior is perfect and always optimally adapted to the ecological system. Humans on the other hand are the only creatures in the natural world to have an abstract intelligence that is not guided by body or instinct but has to be guided by the mind. On the basis of his spiritual researches, Rudolf Steiner explained this by saying that the same evolutive power that produced the different animal species and reflects in wisdom-guided species-specific animal behaviors, can emancipate from the body in humans, so that the body does not reach full specialization and human beings have that characteristic uncertainty relating to their instincts. This power is instead available as the thinking system that enables humans to make up the instinctual "deficit" in full conscious awareness. The hypothesis shows why there is no law in nature that cannot be thought by the human mind and why human intelligence corresponds to all the laws according to which the human body is built and according to which the configuration of the human body relates to all other natural entities and the whole context of earth and universe. The hypothesis shows why creation of the natural world ended with the animals and a transition occurs with human beings, natural development becoming development in mind and spirit. Humans grow out of what is given in the world we perceive with the senses and into developmental contexts that can no longer be perceived and grasped by the senses. Humans are able in their thoughts to set goals and ideals for their biography and their life, working to bring them to

realization in their lives, though they may never bring them wholly to fruition. They have greater-spiritual-developmental potential than can be realized in a life.

Human Biography and Spiritual Activity

I would now like to take up the theme of this essay-human biography and its genetic instrument. The essential armamentarium for human biography is human thinking. This gives orientation as to how to proceed, setting goals for development. Psychoneuroimmunological research and psychotherapy for serious immunological diseases such as cancer and AIDS have shown quite clearly that the functional capacity of the immune system depends to a high degree on a motivated, positive approach to life, some degree of idealism, and the ability to set goals (Adler et al., 1991). Thus there is direct interaction between human thinking and the biological processes in the body. This relates not only to immunological processes but also to the whole human vitality, and especially also the reproductive system. Our genetic material is not only influenced by environmental factors today, but also by the way people think, feel and shape the life of the conscious mind.

A great deal of research will clearly be needed to verify the details of the working hypothesis so clearly stated by Rudolf Steiner. Let me show it in a sketch here in conclusion.

According to this hypothesis, genetic material is selected not on the basis of good or bad luck or random chance, but by the human I, a reality in the spirit even before birth. With the aid of its thought organism (called the "ether body" by Rudolf Steiner, 1904) it has selected and combined the paternal and maternal genetic material in the way most appropriate to the individual's development. The genetic piano keys of our ancestors are played by the essential individual nature of the human being himself, and this also takes in the environmental influences it needs by developing specific interest and abilities to relate. Using its powers of thought, individual human nature sets its own developmental goals. At the same time it will depend on how it thinks about nature and the earth how these will develop in the centuries ahead. For in

the human being evolutive potential comes free of the germ track of species, being available to man as thinking activity; independent creative potential to develop a concept of his own further development.

References and notes

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