Foreword: From Reductionist Science to Living Thinking in Medicine

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"Medical études" is the title Armin Husemann would have preferred for the studies published here, and rightly so. In this book, Husemann—an anthroposophic physician, Goethean researcher, teacher, and head of the Eugen Kolisko Academy at the Filder Clinic in Filderstadt (near Stuttgart)—develops a medical perspective on the human being that infuses the often highly abstract scientific foundations of medicine with artistic sensibility. The result is a new, supple form of medical thinking that might be called "medical science through art," to use an expression previously coined by Husemann himself.[1]

Far from simply using artistic witticisms or illustrations to embellish prosaic scientific insights, this approach involves artistic and imaginative ways of configuring medical thinking itself—in other words, the development of "precise imagination." The impetus for this approach comes from Johann Wolfgang von Goethe's scientific and artistic work and from Rudolf Steiner's Anthroposophy. At various times, Steiner (like Goethe before him, to some extent) recommended that training for professions dealing with people—for example, physicians, educators, and priests—convey the scientific and

anthropological fundamentals of their respective fields in the form of a "sculptural–musical–linguistic study of the human being."[2] To date, especially with regard to providing an artistic form for theoretical instruction and to systematic practice in the arts themselves, the Eugen Kolisko Academy is the medical school that has developed and applied this approach most systematically to education for fostering the development of corresponding abilities in its graduates.

Medical thinking that has become supple and sensitive through art leads to recognizing connections that are simply inaccessible to any way of thinking accustomed to dealing with molecular particles and their interactions. These connections, however, are of major importance in understanding the principles that govern organisms, in resolving the body-soul dichotomy, in grasping more profound connections between humans and the natural world, and in other basic principles of human medical studies. The idea that human beings are ultimately nothing other than molecular, genetically controlled machines leads to a dead end, also with regard to morality and ethics. As far as our human understanding of our existence and ourselves is concerned, this idea extinguishes life, soul, and spirit—a devastation that cannot remain without consequences for the practice of medicine and for our moral and ethical culture.

With nearly two hundred years of practice in focusing exclusively on measure, number, weight, and their processing in mathematics and statistics, modern science has achieved unprecedented, fully justifiable mastery and success in its area of expertise, to the great benefit of civilized development. This science may look askance at Armin Husemann's present attempt to imbue the study of the human being with artistry and may find it insufficiently "scientific" in character. We must not neglect to consider, however, that each science must be adapted to suit its object, not vice versa—a point that Goethe already made abundantly clear. Are we investigating an organism's physical and chemical processes and substances with their primary determinants of measure, number, and weight, or are we following that same

organism as a living figure involved in spatial and temporal processes of metamorphosis? It makes a difference. The first approach requires an analytical method and leads to physical and chemical laws and forces; the latter requires a synthesizing—i.e., holistic and living—capacity for imagination and leads to morphological principles that manifest in the organism in supple (i.e., living) ways.

Nowadays, of course, genetic and molecular processes are said to underlie all life processes, including morphogenesis. Supposedly, therefore, the organism's configuration and its metamorphoses can be traced back to physical and chemical laws that can be formulated in mathematical terms. Life is denied any autonomous forces and principles of its own, and the same is true of our soul and spirit aspects: They are an illusion or perhaps a social construct or a product of the brain, but certainly nothing real.[3]

This, however, is a bias that can be traced back to habitual ways of mechanistic thinking that developed from the seventeenth to the nineteenth centuries. These ways of thinking do justice to physics and to the body's physical aspects, but not to the human being's specifically living, psychological, and spiritual aspects. And as a few examples will illustrate, this view no longer corresponds to more recent developments in science.[4]

The phenomenon of *emergence,* which is being observed increasingly in many branches of science, is

> ...the appearance of new properties on each higher level of complexity, properties that could not have been foreseen on the previous level. An example: The characteristic features of life cannot be deduced from lifeless matter. Regardless of the extent of our research in physics and chemistry, it will never be able to predict the specific behavior of living organisms. This seems to be a universally valid principle: The (more complex) whole cannot be derived from its (simpler) parts. No level of increased complexity is an exception to this rule.... Or, on the other end of the scale: The characteristics of consciousness cannot be extrapolated from

> behavior [or from the brain—P. H.].... Emergence leads to the important conclusion that reductionism is a fallacious doctrine."[5]

To put it differently, matter, life, soul, and spirit are emergent levels of existence. No emergent level can be derived from the one before it. Each level has its own, new—*emergent*—properties and is governed by its own laws. In addition, no level is epistemologically or existentially more "justified" than the others. This is why we must attribute no less "existence," or reality, to life, soul, and spirit than to the material–physical aspect, although these levels of existence all involve *different modes of existence.*[6]

This is clear even to neurophysiologist Wolf Singer, author of the above quote, as long as he is reflecting on actual *experience(!):* "The subdivision of the world into levels of *lifeless matter, living organisms,* and *psychological* and *cognitive* processes reflects... the *coexistence* of systems that describe *experiences that can be differentiated.*"[7] When we look more closely at experiences on the cognitive or psychological levels:

> We experience these immaterial phenomena as being *equally real* as the phenomena of the material world that surrounds us.... We experience the phenomena that we characterize as cognitive or psychological or emotional as *realities of an immaterial world whose existence is as unquestioned by our own experience as the existence of the material world is by our sensory perception....* Our own experience feeds the conviction... that we are participating in a *spiritual dimension* that is *independent of* and *ontologically different from the phenomena of the material world.*[8]

Singer does not accept in *theory* what he does admit with regard to *experience*, but this is only because he (like many other scientists) has been trapped by reductionism's hypnotic suggestion. And so, in contradiction to his own experience and the emergent organization of nature, his theory attributes reality only to matter and physical energy.

This also becomes obvious when we consider emergence from the perspective of *causality.* The reductionist interpretation of phenomena

assumes "bottom up" causality—i.e., that each subordinate level causes or determines the one above it. As even physicists realize, however, emergence includes not only "bottom up" but also "top down" causality: "The point is that higher properties themselves...are key variables in the causal chain. Paradoxically, although the higher properties emerge from the lower processes, they have a degree of causal independence from them: Higher processes operate according to their own higher logic. Physics makes possible, but does not causally determine, the higher-order layers.... Moreover, causes at those higher levels in the hierarchy of complexity have real effects at lower levels, not just the reverse as [is] often thought."[9]

Thus the higher level works down on the one below it, and only in this sense is it justified to speak of a "hierarchy" or system of "subordination" or "superordination." However, if a higher level is to work downward on the one below, it must have access to *active forces of its own*—not those of the subordinate level. *Thus each emergent level bears its own effective causes within itself.* Consequently, the subordinate level cannot be the *cause* of the higher one, but only the *condition* for its appearance. Accordingly, we are justified in ascribing level-specific *effective forces of their own* to each of the primary emergent levels of *matter, life, soul, and spirit.* This is a point made as early as 1925 by Rudolf Steiner and Ita Wegman, who also made it a key element in their anthroposophically expanded medical study of the human being.[10] It also forms the basis of Armin Husemann's studies and—as a result of recent insights into the organization of complex natural processes—is also becoming a central postulate of mainstream science, as we will now illustrate using the example of biology, the emergent level of life.

In biology—and especially in morphogenesis—increased attention is being paid to the "concertation," or orchestration, of molecular biological processes. For example, during gastrulation in the early zebra fish embryo, thousands(!) of future mesoderm cells undergo a "single synchronized internalization wave around the entire circumference."[11]

Synchronization of this sort is possible only when coordination of the necessary gene regulation and gene expression cascades in those thousands of disparate cells is both *simultaneous and purposeful*—i.e., it occurs *as a unit or as a whole.* However, *simultaneity* in the regulation of disparate local processes within a whole cannot be achieved *exclusively through exchange of messenger substances* among these local processes, because communication via messenger substances (e.g., ribonucleic acids, regulator proteins, etc.) takes time and can therefore function only in succession. In morphogenesis, however, many different regulatory and gene expression cascades that are mediated by messenger substances must be "orchestrated."[12]

In an orchestral concert as in biology, orchestration, or *"concertation,"* is possible only through *synchronization.* A conductor achieves this by *simultaneously* beating time *for all of the locally disparate players,* whose cascades of tone (melodies) are interwoven or follow each other *in time* and so on to bring about the symphonic ("sounding together") aspect of the music. Only this directorial synchronization, which constitutes a *hierarchically superordinate* "top-down" activity relative to the disparate players, pulls them together into a symphonic unity and reveals the piece of music as a spatial, temporal, and purposeful whole. This active synchronization is what directs the overall progression, with all if its changes in tempo, from the first measure through the entire landscape of the concert to the confident conclusion of the final chord.

Synchronization in an organism is an analogous process. Spatially intertwined regulatory molecular–biological process cascades linked through feedback loops provide the material basis for orchestration, but due to the sequential character they impose, analyzing them does not suffice to explain the synchronization.[13] To describe individual regulatory substances as "factors [that] act in concert,"[14] makes sense only if the concert analogy is logically correct. The decisive factor here is the *active* and (to put it redundantly for the sake of clarity) *simultaneous synchronization of local cells and factors as a*

whole with a common goal. This is made possible only by a consistent, *spatially non-localized,* causative principle that actively determines *spatial* causation from a *hierarchically superordinate level.*[15] More recently, therefore, there has been renewed discussion in biology of the principle of a *morphogenetic field* that works from a causally superordinate level to coordinate individual factors, arranging them in time and space. Thus in his article *Morphogenetic fields in embryogenesis, regeneration, and cancer,* Leven writes: "The quintessential property of a field model is *non-locality*—the idea that the influences coming to bear on any point in the system are *not localized to that point* and that an understanding of those *forces* must include information existing at other, distant regions in the system."[16]

We are confronted here with "non-local control of pattern formation"[17] and "the hypothesis that many diverse examples of pattern formation are best understood not as cell-level behaviors around any one locale but rather at higher levels of organization."[18] This is possible only as a result of *"a deep principle not inextricably tied to any specific signaling pathway"*[19] through an active principle that is superordinate to all of these pathways, determining them in the sense of active, purposeful, top-down causality, whether working toward the definitive form in embryogenesis or actively maintaining that form throughout life. Not genes and molecular biological process cascades, but rather a super-spatial force organization working from a super-material level must therefore be responsible for "the dynamic nature of *morphostasis,* in which shape must be maintained actively throughout life."[20] From this perspective, a dynamically operating force principle is what makes an organism an organism, that is, a living being. This force principle corresponds to what Goethe called the *type*, whose formative forces generate and maintain the inner and outer form and its metamorphoses.[21] Suspension of the necessary unfolding of forces is identical to death. That is why a corpse breaks down into its components—ultimately, those it has in common with the mineral world—and all emergent properties of life dissolve.

Obviously, the term "morphogenetic field" can be used only comparatively, as an analogy to the familiar "force fields" of physics. That is, we must not overlook the difference between "morphogenetic" and physical force fields. The latter, active *in space*, are *more or less static, internally undifferentiated* force fields that emanate from a *spatially localized material energy source*, whereas the "morphogenetic fields" of life manifest for a lifetime in *living, internally differentiated, organizing activity.* In addition, they *do not emanate from a material source;* rather, they are super-spatial and *non-local* in character; they organize the spatially localized element as a self-contained whole (which may, however, be selectively open to the surroundings). From this perspective, morphogenetic fields are not central but rather *peripheral or spherical* in character. Moreover, they are always *oriented toward a goal* to be achieved,[22] and as such they follow a *temporal dynamic.* They *react* to external disturbances with a flexibility that is not predetermined, as is possible only in the realm of the living but never in a machine.

For these reasons, it would be more accurate to use the term "energy organization" or "force organism" in place of the force field concept borrowed from physics, because "organizing the organism" is what the force organization that makes the type a reality accomplishes. In other words, as an organizing process, it is already an organismic process. To designate this force organization, Rudolf Steiner usually used the term "life body," or, to differentiate it from the material body, the "ether body."[23] From this perspective, the human physical or material body is pervaded by an active, immaterial ether body that is responsible for the fact that the former achieves life.[24]

Thus we are pointed to the cause of the first primary level of emergence beyond the physical body—the level of life. Life pervades matter and elevates it to the more highly organized *organismic* level. This level is already typical of plants. In animals, the organization of the living body is imbued with soul and raised to a third level of emergence; humans are raised to a fourth level, that of spirit. Hence

the typically animal configuration of animal bodies in comparison to mere plant forms and the elevation of the animal form to the specifically human in a body that is constructed for upright walking and for free and intelligent use of arms, hands and fingers and endowed with the capacity for speaking and thinking, thus accomplishing the transition from a being of nature to a being of culture. In this book, Armin Husemann includes all of these elements in his discussion of concrete topics relevant to the theory and practice of medicine.

Body, life, soul, and spirit, however, should not be imagined schematically like a series of shelves, but rather as principles that *work into each other.* No human structure or function should be seen as "just" body, or "just" life, soul, or spirit but rather always in the context of the connection and interdependency of these qualities.[25] Moreover, the soul element in animals or the soul–spiritual aspect of human beings is not anchored exclusively in the central nervous system, as if often believed, but rather in the *whole being*—and in two respects. On the one hand, the soul and spirit elements, as mentioned earlier, are active in configuring the organism, leading to the typically animal or human character of the resulting body.

This *body-configuring activity of soul and spirit*, occurring as it does in the natural process of development, growth, and regeneration (especially during sleep) remains unconscious. For example, we are familiar with neuroplasticity, the regeneration of the brain in accordance with the functions carried out by soul and spirit in the conscious state. This *consciousness function* represents *the other side of soul–spirit activity.* The effect of consciousness on the body is to break it down rather than to regenerate it—a circumstance that Karl Fortlage[26] first brought to our attention, followed by Rudolf Steiner and Ita Wegman.[27] The result was new insights into the connections between body and soul or body and spirit, insights that lead materialistic reductionism only to insoluble problems and absurd theorizing about spirit as a product of the brain.[28]

In summary, we have pointed to a scientific and practical view of body, life, soul, and spirit that no longer sees them through the mechanistic thought forms of the nineteenth century—that is, not as mere products of physical and chemical processes—but instead acknowledges their unique, emergent, autonomous identity and causal interrelationships. Since current science remains focused on physics and (bio)chemistry even in the fields of biology and psychology, this new view requires an *expansion* of science through fields of scientific study that deal with the specific attributes of life, soul, and spirit. The foundations have already been laid in the lifework of Johann Wolfgang von Goethe, Franz Brentano, and Rudolf Steiner, to name only the most important. The result will be a new scientific starting point for an *expanded understanding of human beings and our connection with nature and the cosmos*. That understanding, in turn, will yield new concepts, approaches to research, and practical consequences for understanding health, illness, therapy, and prophylaxis, as well as for the development of *human-worthy moral and ethical principles in medicine*.

The studies by Armin Husemann published in this book deal with just such an expanded understanding and enhanced principles. They are the fruit of attentive observation and of a way of thinking, made supple through art, that does not depend on "model conceptions" and reductionist habits of thought but allows itself to be guided by the *actual phenomena* of the organism's configuration, by processes of life, soul, and spirit. They are also the fruit of in-depth involvement with the work of Goethe and Steiner. Husemann tackles their suggestions completely independently, drawing on a variety of scientific fields to develop their indications into a broadly differentiated and inwardly deepened overall understanding of human beings and our connection to nature and the cosmos.

Some readers accustomed to scientific specialization may be surprised if not disconcerted by the scope of some of the connections Armin Husemann presents in his "études." Here as always, however,

Husemann has internalized, in the fundamental style that characterizes all of his research activity, the approach that Schiller, in his famous letter to Goethe, describes as a key attribute of Goethe's spirit. This approach can definitely point the way for a comprehensive scientific ethos: "You take all of Nature together to shed light on individual details; in the totality of her phenomena you seek to explain the individual. From simple levels of organization you ascend to the more complex, ultimately assembling the most complex of all—the human being—from all of the materials in Nature's edifice."[29]

Armin Husemann's Goethean methods of research and instruction have a great deal to teach us about how to develop such a comprehensive scientific ethos. These methods also underlie the studies published here. For example, when he develops the "type" (vital principle) of the human being as a whole from the structure and functioning of the small intestinal mucosa, the subject is explored from four or five different perspectives, until the activity of the whole within the part, as a living idea, becomes evident. Also important for aspiring anthroposophic physicians are his investigations of *systematic connections between the human being and nature* (e.g., the comparative functional anatomy, or physiology, of human and animal, the human and the mineral worlds, human and plant, humanity and Earth).

As mentioned, the Eugen Kolisko Academy uses artistic activity to enhance the effect of theoretical instruction presented in this way. Practice in shaping and transforming three-dimensional sculptural images and consciously dwelling on relationships among tones and rhythms and on the inherent meaningfulness of spoken poetry all foster the capacity to understand the configurations, metamorphoses, and proportions of organisms and to grasp the intrinsic essence of formed phenomena.

That Husemann has spent years developing such faculties in himself can be experienced directly in his theoretical classes. For more than twenty years I have been privileged to have this experience, supplementing his medical studies classes at the introductory

anthroposophic medicine seminar in Stuttgart and at the Eugen Kolisko Academy with my own presentations on the epistemological foundations of anthroposophic medicine. Each time, the students and I are enthused by his lively, eminently artistic presentation style, his ability to convey the material through concrete illustrations, and his thinking, which is so clearly schooled in artistic sensibility and combined with an obvious love for the subject of his teaching and ongoing research. Each time I see him, he reports enthusiastically on some new discovery he has made in the meantime, whether observed in nature or in a report in recent scientific literature that complements, confirms, or corrects his own discoveries (often in surprising ways), or reveals them in a new light.

Armin Husemann's art-imbued study of the human being and the natural world is constantly growing, differentiating, metamorphosing, and developing, as this book also testifies. His "human science" has assumed something of an organismic form itself; it is not a schematic system that can ever be "finalized." In Dr. Husemann, we experience an exemplary *enlivening and humanizing of science and teaching.* In my view, science and education need to be adapted to conform to the human and natural worlds on a deeper level. The need for evolution in this direction is all too obvious in undesirable developments of the present day. It is my hope that this new book will inspire many readers, especially the younger ones, to participate actively in this urgently needed shift toward living thinking in medicine.

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Notes

1 A. J. Husemann, *Menschenwissenschaft durch Kunst: Die plastisch-musikalisch-sprachliche Menschenkunde.* Stuttgart, 2007.

2 Ibid.

3 W. Singer: «Vom Gehirn zum Beswusstsein» in G. Lüer / N. Elsner (eds.): *Das Gehirn und sein Geist,* Göttingen 2001, pp. 189–204; G. Roth: «Die neurobiologischen Grundlagen von Geist und Bewusstsein» in M. Pauen / G. Roth (eds.): *Neurowissenschaften und Philosophie. Eine Einführung,* Munich 2001, pp. 155–209; M. Gazzaniga: *Die Ich-Illusion. Wie Bewusstsein und freier Wille entstehen,* Munich 2012.

4 P. Heusser: *Anthroposophische Medizin und Wissenschaft. Beiträge zu einer integrativen medizinischen Anthropologie,* Stuttgart 2011.

5 B. Kiefer: «Das Prinzip der Emergenz» in *Horizonte* 12, 33, 2007.

6 P. Heusser: «Emergenz und Kausalität: Systemische Interaktion von Körper, Leben, Seele, und Geist des Menschen» in P. Heusser, / J. Weinzirl (eds.): *Medizin und die Frage nach dem Menschen,* Würzburg 2013, pp. 35–50.

7 W. Singer: «Gekränkte Freiheit. Interview with Wolf Singer» in G. Roth / K. J. Grün (eds.): *Das Gehirn und seine Freiheit. Beiträge zur neurowissenschaftlichen Grundlegung der Philosophie,* Göttingen 2005, p. 86. [Italics added by P. H.]

8 W. Singer: «Verschaltungen legen uns fest: Wir sollen aufhören, von Freiheit zu sprechen» in C. Geyer (ed.): *Hirnforschung und Willensfreiheit,* Frankfurt am Main 2004, pp. 33 and 36. [Italics added by P. H.]

9 G. F. R. Ellis: "Physics and the Real World," in *Physics Today* 6, 2005, pp. 49–54.

10 R. Steiner / I. Wegman: *Grundlegendes zu einer Erweiterung der Heilkunst nach geisteswissenschaftlichen Erkenntnissen,* CW 27, 7th ed., Dornach 1991 [English: *Extending Practical Medicine Fundamental Principles Based on the Science of the Spirit*].

11 P. J. Keller / A. D. Schmidt / J. Wittbrodt / E. H. K. Steltzer: "Reconstruction of Zebrafish Early Embryonic Development by Scanned Light Microscopy," in *Science* 322, 2008, pp. 1065–1069.

12 T. Lecuit/L. Le Goff: "Orchestrating Size and Shape during Morphogenesis," in *Nature* 450 (7167), 2007, pp. 189–192.

13 Ibid.

14 J. Rehwinkel et al. "Nonsense-mediated mRNA Decay Factors Act in Concert to Regulate Common mRNA Targets," in *RNA* 11, 2005, pp. 1539–1544.

15 Note that this also applies to "non-local correlations" of spatially disparate photons that are moving in opposite directions at the speed of light but are so entangled with one another that experimentally influencing *one* photon simultaneously also affects the *other* without impacting it directly and with no possibility for "communication" in spacetime between the photons: "All of today's experimental evidence points to the conclusion that nature is non-local.... No story in space–time can tell us how non-local quantum correlations can happen; hence, non-local quantum correlations seem to emerge, somehow, from outside spacetime" (N. Gisin:

Quantum Non-locality: How does it happen? In: *Science* 326, 2009, pp. 1357–1358).

16 M. Levin: "Morphogenetic Fields in Embryogenesis, Regeneration, and Cancer: Non-Local Control of Complex Patterning," in *Biosystems* 109 (3), 2012, pp. 243–261.

17 Ibid.

18 Ibid.

19 Ibid.

20 Ibid.

21 Goethe: «Die Metamorphose der Pflanze» in *Sämtliche Werke,* E. Beutler, ed., Zurich 1950, vol. 17, pp. 22–58 [English: The Metamorphosis of Plants, MIT, 2009]; Goethe, «Erster Enwurf einer allgemeinen Einleitung in die vergleichende Anatomie, ausgehend von der Osteologie» in *Sämtliche Werke,* E. Beutler, ed., Zurich 1950, vol. 17, pp. 231–269.

22 In contrast to physical processes, living, organic processes always work *teleonomically.* E. Mayr: *The Science of the Living World,* 7th ed., Cambridge 1999.

23 R. Steiner / I. Wegman: op. cit.

24 Ibid.

25 P. Heusser: «Emergenz und Kausalität: systemische Interaktion von Körper, Leben, Seele und Geist des Menschen» in P. Heusser / J. Winzirl (eds.), op. cit.

26 K. Fortlage: *Acht physiologische Vorträge,* Leipzig 1869.

27 R. Steiner / I. Wegman: op. cit.

28 P. Heusser: «Der wissenschaftstheoretische Ansatz der Antroposophischen Medizin und das Leib-Seele-Problem» in *Das Leib-Seele-Problem. Zur Entwicklung eines geistgemäßen Meenschenbildes in der Medizin des 20. Jahrhunderts,* Arlesheim 2011, pp. 11–33.

29 F. Schiller: letter to Goethe, Aug. 23, 1794 [English: *Correspondence between Schiller and Goethe, 1794 to 1804.* New York: Wiley, 1845].

30 R. Steiner / I. Wegman: *Grundlegendes zu einer Erweiterung der Heilkunst nach geisteswissenschaftlichen Erkenntnissen,* CW 27, 7th ed., Dornach 1991, page 1 [English: *Extending Practical Medicine: Fundamental Principles Based on the Science of the Spirit*].

31 Steiner: *Grundlinien einer Erkenntnistheorie der Goetheschen Weltanschauung mit besonderer Rücksicht auf Schiller,* CW 2, 8th ed., Dornach 2003 [English: *Goethe's Theory of Knowledge: An Outline of the Epistemology of His Worldview*]; Steiner: *Wahrheit und Wissenschaft. Vorspiel zu einer* Philosophie *der Freiheit,* CW 3, Dornach 1958 [English: *Truth and Knowledge Introduction to the Philosophy of Spiritual Activity;* Steiner: *Die Philosophy der Freiheit,* CW 4, 14th ed., Dornach 1978. [English: *Intuitive Thinking as a Spiritual Path: A Philosophy of Freedom*].

32 As a continuing education establishment for anthroposophic medicine, the EKA has been collaborating since 1987 with the Filder Clinic in Filderstadt (near Stuttgart), the Association of Anthroposophical Clinics (Klinikverband Anthroposophischer Kliniken) in Germany, and the Society of Anthroposophic Physicians in Germany (Gesellschaft Anthroposophischer Ärzte in Deutschland, GAÄD), as well as with the Medical Section of the Goetheanum in Dornach, Switzerland.

33 A. Husemann: *Human Hearing and the Reality of Music,* SteinerBooks 2015; A. Husemann: *Der*