

## *Editorial*

### **Gestalt theory and morbid anatomy\***

**W. Doerr**

em. Direktor des Pathologischen Institutes der Universität,  
Im Neuenheimer Feld 220/221, Postfach 104340, D-6900 Heidelberg 1  
Federal Republic of Germany

To my knowledge no pathologist has ever written about gestalt theory, a fact that may be surprising. Werner Hueck and his pupil G. Holle certainly recognized and referred to these problems, but without ever making them the specific object of their research<sup>1</sup>.

In writing this article, I am therefore perhaps taking a risk and may be making unreasonable demands on the reader, but I believe the attempt is nevertheless worthwhile because theoretical pathology certainly needs the intellectual foundation of gestalt philosophy.

I would like to take up a point made by P. Ernst. At the end of a life-long career as a university lecturer, it is easy for me to divide my students into three groups:

1. Rather more than half of all medical students perceive by means of visualization. These people are so-called “eidetics”, imaginative types.

2. A third of all medical students are “kinaestheticians”; they grasp matters literally by handling them.

3. The remainder of my students (about one-ninth of them) perceive aurally. They are able to assimilate, spontaneously and accurately, a series of acoustic events.

There is also a more general attribute, which can be termed “gestalt perception” or “gestalt blindness” (Höfler 1960). An essential part of reality

---

\* Based on a lecture given to the Auenbrugger Society, Graz, Austria, 2 February 1983

<sup>1</sup> Karl Lennert concerned himself with gestalt theory at the Annual Meeting of the German Pathology Society, Lucerne, 25 May 1983, but from another point of view

This text was translated from the German. However, many of the German expressions and concepts peculiar to gestalt theory can only be interpreted in general terms. Readers who are particularly interested in the questions of gestalt philosophy can obtain a copy of the original German text from the author upon request.

*Offprint requests to:* W. Doerr at the above address

has an organized structure and, to understand this, the human brain must make use of morphology.

Many major natural scientists have described their individual weaknesses. For example, Justus Liebig admitted (Doerr 1977):

“My memory of things I had heard was not good, that is I retained nothing or very little of what one learns by means of the auditory sense”.

Elsewhere Liebig said: “... that the eyes see nothing that the mind has not first thought”.

The two statements only seem to contradict each other, for as Ludwig Klages (1929) stated:

“Mind and matter are the two halves of existence, life and imagery the two poles of reality” – defining a reciprocal bond between sensory (visual/auditory) and concrete (kinaesthetic) experience.

We all know that according to Kant, there is only as much science in a natural science as there is mathematics in it. This is a dangerous statement. Those who do not see that Aristotelian logic is a pure distillate of Pythagorean mathematics, those who do not know that Spinoza wanted to analyse metaphysical and ethical problems *more geometrico* (i.e. in accordance with the Euclidian method), and those who have not learned to recognize that the deeper meaning of mathematics for human culture lies in the symbolic plane (Knopp 1928), may all succumb to the temptation that has claimed innumerable scientists as its victim during the last 50 years. They may choose to reduce qualitative differences in the properties of things to quantitative ones.

Herein lies the reason why Gustav Rickers’s theory *Pathologie als Naturwissenschaft* (Springer, Berlin, 1924), which in the years 1930–1955 seemed to have become an established medical theory because of its *Relationspathologie*, had been almost forgotten a few years later. Almost unnoticed, there emerged a new theoretical foundation for general biology (and therefore also for pathology), which for the moment I shall call the *organismic* foundation.

In the summer of 1951 I had the opportunity of having a profound discussion with Bertalanffy. It was only a small step from his theoretical biology to the works of Christian von Ehrenfels and Wolfgang Köhler. What had always excited patho-anatomists was the question of the maintenance of equilibria, of gestalt qualities, the general systems theory and the biophysics of open systems. How is it that certain structural properties of organic gestalten always appear to be present whatever the circumstances and for long intervals? Where does the “pathic” begin that according to Virchow can only be a “degenerate” norm? What are the criteria of biological time?

The objective of all science is the recognition of order (J. von Uexküll 1913), but biology is essentially intuitive and thus theoretical biology searches for an order that is as free of hypotheses as possible. It is a theory of cognition and methodology in one (von Bertalanffy 1928).

Most people are not accustomed to recognizing the laws that govern the inter-relationships between the parts of a whole system with regard

to their individual significance (*Bedeutungsbeziehungen*); it is almost a *terra incognita*. To overcome these difficulties, one should make use of gestalt philosophy, which helps in the characterization of the *Eigenwelt des Menschen* (Petersen 1937). For 30 years, I have attempted to make the elements of theoretical biology visible in the framework of my lectures on general pathology. I would like to show that from here it is only a small step to Plato's theory of ideas; that in gestalt philosophy we possess a natural control system; that a general, morphologically oriented pathology of metabolic events can only be understood as "an event in time" against this background. This methodological standpoint is a long way from "natural philosophy"; it means more than Rössle's way of thinking, which was based on natural history (1923); it is free of mysterious holistic relationships; it has nothing to do either with the vitalism of the turn of the century or the holism of 1930s.

I would like to develop my argument in the following way:

1. I shall first explain my conception on the meaning of "gestalt".
2. I shall discuss the historical development of what are called gestalten.
3. I will then make some critical observations on the subject of the integrity of living systems and their gestalten.
4. I will also attempt to show what can be achieved by the application of gestalt philosophy in the field of morbid anatomy.
5. Finally, I will supply a supplementary collection of gestalt concepts and list other things that have been described as gestalt.

Goethe was deeply and continuously concerned with the study of Socrates and Plato (Doerr 1979a). Socrates discovered the "concept", the "unifying factor", which summarizes a concept within diversity: *eidos*; Plato developed this concept to the "idea". The character of "*eidos*" is predominantly substantive, that of "idea" transitive. The "concept" is bounded by the finite; the "idea" aspires to boundlessness and infinity. Here we reach the threshold of Goethe's formulation: ideas are ventured in audacity; concepts are formed in modesty.

The concept of gestalt is linked to the ability to grasp what, in the multiplicity of phenomena, can be regarded as the essential aspect of the idea (Rotten 1913). According to Goethe, German speakers have the word "gestalt" for the complex representing the true being, if they wish to emphasize that something has a very special nature. The special nature of life is not based on a chemical mystery, but on its organization. The structure of life is not merely a phenomenon of physical chemistry; it is a question of order, of molecular order. It is therefore a question of gestalt. All of life is bound to gestalt. These gestalten do not have being, they happen. They are realized constantly, changed in minor ways, and then remade, changed again and so on.

In Vienna in 1890 von Ehrenfels, continuing the earlier investigations of E. Mach in Prague (*Beiträge zur Analyse der Empfindungen*, Jena, 1886), explained what gestalten are and what is to be understood by gestalt qualities. The gestalt concept was first applied to psychology in opposition to the "atomism" of "associationism" (von Bertalanffy 1928).

This work may be simplified as follows:

*First Ehrenfels criterion.* The characteristic properties of a gestalt are not composed of the sum of the properties of the component parts. A whole is therefore more than the sum of its parts and is not an additive phenomenon. Therefore, a gestalt can only be understood when the significance of the association of the component parts for the whole has been recognized.

*Second Ehrenfels criterion.* By gestalt qualities we mean the positive conceptual content that depends on the existence of "perceptual complexes" in our consciousness. These for their own part are made up of components that can be separated one from another. These "perceptual complexes" are the basis of gestalt qualities.

Space gestalt means the configuration of visually perceptible objects. Each individual object does not, of course, render the special character of the whole, which can only be seen by the recognition of the complete spatial arrangement of the component parts.

A few weeks before his death in 1932, von Ehrenfels made his last comment on gestalt qualities, published only in 1960. He explained tone gestalt, using melodies as examples, showing that successive sounds induce simultaneous awareness complexes, which he called "substantiated contents". Absolute pitch he saw as a memory for simple elements in this field and not that this is much rarer than a memory for melodies and harmonies. He also commented that mnemonic aids are based on gestalt qualities.

Here I should like to insert an anecdote. The life-long friendship between Liebig and Wöhler almost reached breaking point because in early work Liebig had produced and specified the molecular formula for silver fulminate, the silver salt of fulminic acid. One year previously Wöhler had found the same formula for silver cyanate.

In terms of the then current scientific knowledge this was neither possible nor acceptable. However, hundreds of tests showed that both men were right, i.e. that different isomers had the same molecular formula. As if in anticipation of the gestalt theory, Liebig found a plausible explanation: the German word *Dome* is related neither to *Mode* nor to *Odem*, even though the words have both the same letters and the same number of letters. The order of the letters thus determines what can be referred to as "tone gestalt".

Finally, I would like to mention time gestalt: a physician can only recognize certain clinical pictures if the sequence of symptoms is observed in a given time course. This has been known ever since Laennec (1820), or more precisely, since Clemens von Pirquet's essay (1907) *Zur Theorie der Inkubationszeit*, which introduced the concept of "allergy".

As far as the historic development of the concept of "gestalt" is concerned, I believe, like Jürgen Steinkopff (1979), that the concept of gestalt originates in "aesthetics". In antiquity, aesthetics was the theory of sensory perception; for Kant it became the theory of space and time. Gestalt can be regarded as the sensory expression of an idea, clearly reflecting the har-

monics of a gestalt. Gestalt has been understood to be the “expression that clothes” the thought. With Dilthey (1973), gestalt is the expression of poetic experience and is part of the hermeneutic process. In educational theory gestalt appears to be the expression of “procreative love”. It is clear that the development of the concept of gestalt belongs predominantly to the field of psychology. The Graz school of psychology, continuing the work of Ziehen (1925) and Weinhandl (1960), produced a synthesis of the different aspects of gestalt. “Gestalt as the inter-relationship between all of the aspects of gestalt, as organized by an inner law”, is a part of stylistic interpretation with regard to metre, sentence structure and speech rhythm. When referring to gestalt, Wolfgang Köhler (1933) replaced the concept of sensation by that of the “elementary quality”. Modern gestalt theory (Metzger 1975) has provided us with the following knowledge:

1. Within this theory, a whole describes a non-isolated structure or circumstance having properties which are not necessarily derived from identical properties of its components. Hence the whole has a quality of its own that need not be the same as that of its components.

2. The relationship between the whole and its parts can be described as dialectic. Gestalt qualities can be investigated experimentally or by rational means.

3. A theory of the psyche that does justice to experience need not be contradictory to knowledge of non-psycho processes. In the terms of gestalt theory, mental and physical processes correspond.

4. Gestalt is not something theoretical and incomprehensible, but can always be defined and understood in concrete terms.

The word “gestalt” was taken over into the English language by Wertheimer (1923) and either does not need to or cannot be translated. The specialty journal for scientific study into all that bears reference to gestalten is simply called *Gestalt Theory*.

Of course, there has also been criticism of the gestalt theory, the most reasoned by Feuerborn (1938), who wrote that: in an inhabited and concrete world, holism is not a solution, rather it presents a problem, for there can be no certain synthesis without analysis. Structural analysis of living systems in their entirety can be performed independent of time or place. The state of existence of such an “organism” consists of the co-existence of specifically ordered and specifically conditioned components, matter and energy components, so-called elementary qualities. The whole of a living system is the sum of its specifically disposed parts. A living system in its entirety is the expression of the specific order of these parts.

Just as the meaning of a sentence is not the sum of the meanings of the individual words, so the properties of the whole are not determined by the properties of its component parts. Some of the original qualities of the structural units are lost.

The real problem lies in the concept of “specific order”. The whole cannot determine the properties of the parts, but the adapted or “diminished” properties of the parts determine the final effect. The concept of the whole is closely related to that of the sum, but the character of the

gestalt remains a problem in itself. Obviously, the interactions between the specifically ordered and the specifically conditioned components are the critical factors.

My aim was actually to discuss the importance of gestalt philosophy in morphological research into disease, but it is always true that to achieve a certain solution one has to examine the source of the problem. According to Hermann Braus (1913), morphology is the historical theory of events, but Dietrich Starck (1978) saw it as the study of the forms of organisms. Goethe's morphology is the theory of evolution. Goethe's morphological research and Schiller's aesthetic speculation are the beginnings of the typological approach. Goethe's efforts were directed towards searching for the "idea in experience". Later, Goethe (1820) suggested, first intuitively and then deliberately, an anatomical typicality, namely a more general image, in which the gestalten of all animals were included. This *ideal type* does not exist in reality. No organism quite corresponds to the idea that is its basis, for behind each being lies a "higher" idea. In gestalt the conceptual contradiction between internal and external is nullified; external reality is the manifestation of internal nature.

Without Plato's theory of ideas, Goethe's type could not be understood; indeed, the similarity between Plato's theory of ideas and Goethe's typology represents a remarkable instance of convergent thought.

The ideas of Plato are the faces of existence. Just as man is apparent in his face, so being is apparent in ideas. Without Plato's theory of ideas, there would be no gestalt theory, without gestalten no scientific morphology, without Plato's gestalten no gestalt philosophy, and without this no understanding of the following relationships: gestalten as the idea, the idea as Goethe's type, type as an element of the central morphological idea of homology. The basic question that confronts all biologists, anatomists and pathologists (Doerr 1970) is: How can the "successive" be the "simultaneous"? This is not a matter of explaining processes in the sense of how a natural science functions technically, but of "insight" in a wider context.

Gestalt philosophy can also be applied practically.

1. The determination of homology is based on the observation that similar forms can be recognized by position and structure (Portmann 1959).

Homology played an important role in the development of comparative anatomy. I would like to remind you of the oft-cited argument between Cuvier and Geoffroy de St. Hilaire (1830). Goethe was on the side of Geoffroy, but Cuvier was deigned to be right, although he had not grasped at all what homology actually entailed.

The air bladders and the lungs of fish are homologous organs, for they have a common origin. The wings of birds and insects, the lungs of snails and vertebrates, the gills of mussels and fish are not homologous, for although the organs fulfil the same functions, they correspond neither in structure nor in origin.

In terms of comparative anatomy, homology is the expression of common evolutionary origin. In practice, certain criteria of homology must be applied: for example, the same relative position in the structure, the

occurrence of intermediate stages and the documentation of the specific characteristics of the parts. Simple similarities do not alone prove homology.

For us pathologists, gestalt philosophy is of great significance in the homological sphere of our daily diagnostic duties:

a) In teratology, one can predict the occurrence of certain malformations, before objective data are available.

b) In assessing certain structures, for example, the human heart, one can apply gestalt philosophy, although the objects in question appear *prima facie* to have nothing to do with each other. As an example, the atrioventricular node of the conduction system is homologous with the sinus node. They are surprisingly identical, once one has recognized that there is also a cellular correspondence.

c) I have tried for 30 years to show that the structure and function of lymphoepithelial interactions at the cranial and caudal poles are astonishingly alike. The lymphoepitheliomas that were first discovered by Alexander Schmincke in the branchial area have the same structure in the corresponding caudal areas, for example in the gonads. Such things can only be understood if the concept of homology has been properly assimilated and the principles of gestalt theory grasped.

2. Gestalt theory is of outstanding value in the study of specific inflammations. It is most exciting to think that R.Th.H. Laennec (1820) had a much better grasp of the essence of tuberculosis than R. Virchow, for although Virchow was around at the time of Robert Koch's discovery in 1882, Laennec, 60 years earlier, could have had no idea of its aetiology. Laennec understood that tuberculosis in man, regardless of whether it takes a nodular-productive or exudative-caseative course, represents a pathological entity. Therefore, one can diagnose a specific inflammation perfectly well phenomenologically, even without knowing the aetiology. We are still concerned with such matters today, of course. The aetiology of Besnier-Boeck-Schaumann disease has still not been clarified, but we have no difficulty in making the diagnosis. We could also diagnose rheumatic granulomatosis, even if serology were not diagnostic. We pathologists must know the time gestalt and space gestalt of an illness, otherwise a diagnosis cannot be made.

3. You may know of Karl Ernst Ranke's hypothesis (1916) regarding tuberculosis. Ranke, a member of the family of the historian Leopold von Ranke, had the erudition this concept demanded. It was he, the Munich internist, who on the basis of careful clinical observation of the course of the disease – later working together with Schmincke – was able to describe the stage-by-stage course of tuberculosis, uninfluenced by therapy, as we once learned and have taught for decades. Ranke introduced us to the concept of this illness and the knowledge which he provided aided the development of phthisiology in the 1920s. It was at this time that Georg Simon discovered monotopic, pulmonary, apical metastasis, the spreading of coarse "granules", exemplified by the Aschoff-Puhl subapical focus, and the infra-clavicular, so-called early infiltration of Assmann-Redeker-Simon – all manifestations of so-called early or late generalization. Today, although the

possibilities for cure are improved, thinking has become “cheaper”, insofar as it is an increasingly demanding task for the practising physician to assimilate all the data that are made available to him by advances in medical technology and that are necessary to make an accurate diagnosis.

Since 1944 we have developed an expectation of the pathogenesis of the histological changes in tuberculosis: an endogenous infection can be expected in the third decade of life. We know that over 70% of patients suffer from exudative pleurisy and that the foci of the initial period tend to take a phthisic course. If the illness is not discovered, which unfortunately sometimes happens, the whole time gestalt of tuberculosis of the lungs is compressed. If it ends fatally, the complete course of the disease lasts only 5 years.

4. The domain of gestalt-oriented pathology also concerns “therapeutically enforced” pathomorphosis. Those who do not know the natural gestalten of illness cannot grasp the pathological phenomena that can be altered “by a flick of the wrist”. German pathologists have twice concerned themselves with this complex of problems, in 1955 and 1972. We spoke of “real” and of “false” metamorphosis and of “therapeutically enforced” changes in the nosological profile. We have collected a lot of data, but have not really had enough time to establish an intellectual basis for them.

5. The significance of gestalt theory for our work as pathologists also lies in the accomplishment of immediate, practical tasks.

a) Language and gestalt are intrinsically linked; perceptual and phenomenological procedures will alternate in most cases. We live in a world of symbols (Janzarik 1982), and have to summon up a great deal of strength to preserve the binding character of language (Lipps 1977). In the long run, this is only possible if we make use of mathematical logic and learn to create a formal language based on the predicate logic of Bertrand Russell. In future, we will report our findings on the basis of the laws of gestalt theory, in a language of generative grammar, and of course make use of computer technology.

b) Experimental research on memory is relevant to our discussion (Tritthart 1969). The modern technique of holography permits storage of information. It works in this way: if a photographic plate and the object under study are directly exposed to a coherent laser beam at the same time, apparently meaningless figures are recorded on the plate. If this hologram is then again exposed to the coherent laser beam, a three-dimensional picture of the object appears, a form that conveys a wealth of concrete experience. The essential advantage of holography is that the information, which first focuses on a specific point on the object, is then spread over the whole surface of the hologram and is therefore resistant to obliteration.

This is an example of modern, experimental biology, which borders on physics, sensory physiology and pathology and would have spurred on Mach, the physicist, or von Ehrenfels, the philosopher, if they had had the slightest notion of such possibilities.

c) Finally, I should like to point out a very simple connection between gestalt theory and pathologico-anatomical diagnostic work – the problem



of objectively recording the natural colours of organs obtained at autopsy. The expert is able to perform outstanding work and can see without difficulty from the section of, for example, a kidney, whether the colour has been determined by damage due to phenacetin, by haemosiderosis or by argyrosis. For 60 years pathologists have been trying to objectify colour values by means of the colour charts of Ostwald. In a general debate at a meeting of the Berlin Association of Pathologists (8 December 1953), I pointed out that separating the various colour qualities of the upper surface and section of an organ, and specifying them by numbers on the double cone of Ostwald's colour chart, can be compared to splitting up a tone gestalt into physical rows of numbers (Doerr 1954). If dealt with in this way, a tone gestalt collapses, and colour gestalt can certainly not be conveyed by numbers. The sensory physiologists, e.g. ophthalmologists, know this, but they attempt for other reasons to objectify colour constancy and memory for colour (Jaeger 1982). There can be no objection to this, as long as it is remembered that the gestalt concept is the regulating factor. Pathologists, however, no longer use colour measurements, for they have found that size and number are important, although not all-exclusive. They unconsciously make use of the psychological gestalt that results from the structured spatial distribution of colours and which is more useful, in terms of association, at least for immediate diagnosis.

In addition to the gestalten I have mentioned, the spatial-configurative, which I call physical, and the visual, auditory and kinaesthetic, which I call psychological, there is the time gestalt, the *ens astrale*, as Schipperges (1982a and b) called it, and, of course, more complicated forms and possibilities.

I would like to remind you of the *Gestaltkreis* (gestalt circle) of Viktor von Weizsäcker's school, the theory of the unity of perception and motion. In his review of the book *Gestaltkreis* in the journal *Zeitschrift für Sinnesphysiologie* (1940), Prince Alfred of Auersperg wrote: "The equivalence of perception and motion, of meaning and purpose, substantiates the connection of the organism to its surroundings."

Weizsäcker's basal anthropology originated in the *Gestaltkreis*, while Paul Christian's observation (that the idea that a fixed correspondence of stimulus and sensation as an element of perception is an artefact) originated in Weizsäcker's basal anthropology. According to Christian, sensation is not an element of perception, but rather a sensory performance, which if disturbed, becomes "labile" and "disintegrates". Functions must be defined by the organization of different kinds of performance, for they are determined by the interaction of mental and physical dimensions. These studies have revealed the dialectic situation inherent in modern clinical medicine; it must interpret man in scientific terms, but can never actually understand him by these methods.

It is not disputed that the morphological and physiological features of the human body can be described in the same way as a physical or biochemical system. It is certain, however, that such an objective analysis conceals one complimentary aspect: the thematic order of physical phenomena, as

Frederick Buytendijk (1964, 1967) termed it. This is the crucial point not only of anthropologically oriented pathology, but also of gestalt theory.

Pathology works idiographically; it searches and finds the natural inequality of man. General pathology works nomothetically and is a science of laws. In his study *Die natürliche Ordnung der Wissenschaften* (1926), Paul Oppenheim developed the basic laws of comparative philosophy, whereby natural science turns to general reality in accordance with a generalized procedure. Nature is the existence of things insofar as it is determined by general laws. Medicine is essentially a science of experience and arises from intellectual honesty. According to Jaspers (1946), the reality of a science of experience is either grasped from without, like matter, or understood from within, like mind. Because of this order, natural sciences and the humanities interact with each other. The right of modern medical research to exist depends solely on the dignity of the research subjects.

A great deal has been written about gestalt philosophy, particularly in the fields of psychology, educational theory and psychopathology (Wertheimer 1923; Katz 1948; Guß 1975). It was important for me to show that morphological pathology also needs gestalt philosophy. I call this kind of work "theoretical pathology" and I believe that it has a future.

The relationship between a particular science and philosophy has always been a critical one, as they both share a kind of mutual obscurity. Empiricism and research into the essence of things are combined like a gestalt circle to form a cognitive process. Without philosophy, science cannot be true; it can at the most be correct (Jaspers, cited in Schmitt 1980).

Theory and experience are in constant conflict. Between knowledge and experience there is a "potential gradient". Man's inner enemies lie in wait at the crossroads between experience and judgement (Schipperges 1982b). The searcher or researcher constantly loses his way. The concept is the sum of experience, the idea the result of experience (Lubosch 1919). Understanding is the intellect of the will, reason the intellect of knowledge (Barthel 1929).

At a time when activity is mistaken for industry, and organization for intellectual expression, I sincerely wish that those involved in medicine would again concern themselves more with the humanities. In Western thought it is possible to distinguish three attempts at guaranteeing intellectual security that are capable of orientating us intellectually: the cosmological goes back to Aristotle, the theological to Thomas Aquinas, and the logological to Hegel.

In the world of Aristotle, the true man of antiquity felt at home, while in the world of Aquinas, it was the Christian man. Martin Buber (1982) writes, however, that Hegel's world has never become the real world for modern man, and Hegel has never calmed anthropological unrest for one moment. I believe that this is a good thing, for only in this way may we succeed in obtaining ethics, in the sense of a form of orientation for action, as a distant aim of behavioural control.

Thus the circle is complete. We started by defining gestalten, but have found the concept of "innerliness". All that is governed by laws and all

order originates from an intellectual principle and its manifestation goes back to the very essence of gestalten (von Ehrenfels, cited in Weinhandl 1960).

### Summary

1. Contact with medical students as a university teacher has shown that there are different types of aptitude: 5/9 of German medical students possess a *visual faculty*, 3/9 are *kinaesthetic* and only about 1/9 have the gift of the *auditive faculty*. Apart from this, there is a general quality which may be termed *gestalt perception* or *gestalt blindness*.

2. The fact that for decades the attempt was made to relate qualitative differences in the characteristics of medical observations and pathological and anatomical findings to quantitative changes was the reason for the development of the concept of *Relationspathologie*.

3. Intellectual pre-occupation with the perception of "gestalt qualities" has resulted in pathology in general being seen as the expression of the biophysics of open systems and making an organismic evaluation of its phenomena.

4. The aim of all natural science is the recognition of order. Theoretical biology seeks an order free from hypotheses. Theoretical pathology involves the application of gestalt philosophy to the detection and evaluation of all potentially dangerous disturbances.

5. Theoretical pathology has nothing to do with "natural philosophy", the "natural history viewpoint", the "vitalism" of the turn of the century or the "holism" of the 1930s.

6. Gestalt qualities can be characterized by means of the "Ehrenfels criteria". In most cases this means distinguishing between "space gestalt", "time gestalt", "tone gestalt", and "sentence gestalt". As defined by gestalt theory, mental and physical processes correspond. Gestalt can always be defined and understood in concrete terms.

7. In the gestalt the conceptual contradiction between "external" and "internal" is overcome. External phenomena are the manifestations of internal nature.

8. In the fields of pathological anatomy, gestalt theory has direct methodological relevance with regard to the following:

- a) the concept of homology
- b) the conceptual idea of what is known as "specific inflammation"
- c) the theory of stages in minor organ diseases
- d) the characterization of the various forms of pathomorphosis
- e) patho-anatomical diagnostics according to the laws of mathematical logic.

9. The relationship between individual sciences and philosophy has always been critical. The individual science and philosophy are mutually obscured from one another. Research into facts and research into essence come together, as in a "gestalt circle", to form a single process of understanding.

10. All lawfulness and order originates from a principle of the mind. The visible manifestation of this principle is the innermost nature of the gestalten.

## References

- Auersperg, Alfred Prinz von (1940) *Z Sinnesphysiol* 68:(Reviews)
- Barthel E (1929) *Die Monadologie der beiden Welten. Abriß der Metaphysik. Jahrbuch der Elsäss. Lothring. Wiss. Gesellschaft zu Straßburg*. Winter, Heidelberg, S. 147
- Bertalanffy L v (1928) *Kritische Theorie der Formbildung. Abhandlung zur theoretischen Biologie* 27. Gebr. Bornträger, Berlin
- Bertalanffy L v (1957) *Allgemeine Systemtheorie. Deutsche Universitätszeitung* 12:XII, 5–6
- Bertalanffy L v (1965) *Die Biophysik offener Systeme. Naturwiss Rundschau* 18:467
- Blankenburg W (1979) *Psychiatrie und Philosophie*. In: *Psychiatrie der Gegenwart*, I. Springer, Berlin Heidelberg New York, p 827
- Braus H (1913) *Experimentelle Beiträge zur Morphologie*, Bd 1. *Die Morphologie als historische Wissenschaft*. W. Engelmann, Leipzig, S 1
- Buber M (1982) *Das Problem des Menschen* (5. Auflage). Lambert Schneider, Heidelberg
- Buytendijk FJJ (1964) *Wege zu einer anthropologischen Physiologie. Internist* 5:147
- Buytendijk FJJ (1967) *Prolegomena einer anthropologischen Physiologie*. Salzburg
- Christian P (1978) see *Ruperto-Carola* 61:51–56
- Dilthey W (1973) *Der Aufbau der geschichtlichen Welt in den Geisteswissenschaften*, 6. Auflage. Vandenhoeck und Ruprecht, Göttingen
- Doerr W (1954) *Farbmessungen im Sektionssaal. S Berliner Pathologen Vereinigung vom 8. Dezember 1953*, 8. 12. 1953. *Zbl Pathol* 92:61
- Doerr W (1970) *Allgemeine Pathologie der Organe des Kreislaufs. Handbuch Allgemeine Pathologie*, Bd III, Tl 4. Springer, Berlin Heidelberg New York, S 225
- Doerr W (1977) *Die natürliche Ungleichheit der Menschen*: In: Born E (Hrsg) *150 Jahre Darmstädter Realanstalten. Darmstädter Schriften* 40. v Liebig-Verlag, Darmstadt, S 46–93
- Doerr W (1979a) *Homologiebegriff und pathologische Anatomie. Virchows Arch [Pathol Anat]* 383:5
- Doerr W (1979b) *Laudatio auf Paul Christian. Ruperto Carola* 61:51–56
- Ehrenfels Chr, von (1890) *Über „Gestaltqualitäten“*. *Vjschr für wissenschaftliche Philosophie* 14:249
- Ehrenfels Chr, von (1932) *Über Gestaltqualitäten* see Weinhandl F, *Gestalthaftes Sehen. Wissenschaftl Buchgesellschaft, Darmstadt*, 1960, pp 61 ff
- Feuerborn HJ (1938) *Zum Begriff der „Ganzheit“ lebender Systeme. Naturwissenschaften* 26:761
- Goethe JW, von (1817, 1820) *Zur Naturwissenschaft überhaupt, besonders zur Morphologie*. Cotta, Stuttgart und Tübingen, Bd I (1817) Bd II (1820)
- Guß K (1975) *Gestalttheorie und Erziehung*. Steinkopff, Darmstadt
- Höfler O (1960) *Morphologie und Objektivität*. In: Weinhandl F (Hrsg) *Gestalthaftes Sehen. Wissenschaftliche Buchgesellschaft, Darmstadt*, p 196
- Holle G (1961) *Das Problem der Methode in der gegenwärtigen morphologischen Forschung. Wiss Z Karl Marx-Univ* 10:159
- Hueck W (1931) *Präsidialansprache, Verhandlungen Dtsch Pathol Ges. 27. Tagung 1931 in München*, Gustav Fischer, Jena
- Jaeger W (1982) *Untersuchungen zu Farbkonstanz und Farbgedächtnis. Sitzungsberichte Heidelberger Akademie der Wissenschaften, Mathematik naturwissenschaftliche Kl, Jahrgang 1982, Ab 5*. Springer, Berlin Heidelberg New York
- Janzarik W (1982) *Psychopathologische Konzepte der Gegenwart*. F Enke, Stuttgart
- Jaspers K (1957) *Die Aufgaben der Philosophie in unserer Zeit. Ruperto-Carola* 22:55
- Katz D (1948) *Gestaltpsychologie*. Benno Schwabe, Basel
- Klages L (1929) *Der Geist als Widersacher der Seele. Bd I: Leben und Denkvermögen. Bd I*. JA Barth, Leipzig, S 129
- Knopp K (1928) *Mathematik und Kultur. Preußische Jahrbücher* 211:283

- Köhler WG (1924/25) Die physischen Gestalten in Ruhe und im stationären Zustand. Eine naturphilosophische Untersuchung. Verlag der philosophischen Akademie, Erlangen
- Köhler WG (1925) Gestaltproblem und Anfang einer Gestalttheorie. *Jahresber Ges Physiol Exp Pharmacol* 3:512
- Köhler WG (1933) *Psychologische Probleme*, Leipzig
- Lipps H (1977) *Die Verbindlichkeit der Sprache*, 3. Auflage. Vittorio Klosterman, Frankfurt/Main
- Lubosch W (1918) Der Akademiestreit. *Biol Zbl* 38:357 und 397
- Lubosch W (1919) Was verdankt die vergleichend-anatomische Wissenschaft den Arbeiten Goethes? *Jahrbuch der Goethegesellschaft* 6:157
- Mach E (1886) *Beiträge zur Analyse der Empfindungen*. G. Fischer, Jena
- Metzger W (1975) Die Entdeckung der Prägnanztendenz. Die Anfänge einer nicht-atomistischen Wahrnehmungslehre. In: Flores D'Arcais
- Metzger W (1975) *Psychologie* (5. Auflage). Steinkopff, Darmstadt
- Oppenheim P (1926) *Die natürliche Ordnung der Wissenschaften. Grundgesetze der vergleichenden Wissenschaftslehre*. G Fischer, Jena
- Petersen H (1937) *Die Eigenwelt des Menschen*. Bios Abhandlungen zur theoretischen Biologie, Bd VII. JA Barth, Leipzig
- Portmann A (1959) *Einführung in die vergleichende Morphologie der Wirbeltiere*, 2. Auflage. Benno Schwabe, Basel und Stuttgart
- Ricker G (1924) *Pathologie als Naturwissenschaft. Relationspathologie*. Springer, Berlin
- Rössle R (1923) Referat über Entzündung. *Verhandlungen Dtsch Pathol Ges* 19:18
- Rotten E (1913) Goethes Urphänomen und die platonische Idee. In: Cohen H, Natorp P (Hrsg) *Philosophische Arbeiten*. A Töpelmann, Gießen
- Schipperges H (1982a) Es kommt darauf an, den ganzen Menschen zu erfassen. *Ärzteblatt Baden-Württemberg* 37:384
- Schipperges H (1982b) Zum Topos von „ratio et experimentum“ in der älteren Wissenschaftsgeschichte. *Fachprosa-Studien*. Erich Schmidt-Verlag, Berlin, S 25
- Schmitt W (1980) Die Psychopathologie von Karl Jaspers in der modernen Psychiatrie. In: *Die Psychologie des 20. Jahrhunderts*, Bd X. Zürich, pp 46–62
- Starck D (1978) *Vergleichende Anatomie der Wirbeltiere*, Bd 1. Springer, Berlin Heidelberg New York
- Steinkopff J (1979) Semantische Betrachtung zum Begriff „Gestalt“. *Gestalt-Theory* 1:9
- Tritthart A (1969) Neurophysiologische Gedächtnisforschung. *Documenta Geigy* 169:S 5
- Uexküll J v (1913) *Bausteine zu einer biologischen Weltanschauung*. Bruckmann, München
- Virchow R (1856) *Gesammelte Abhandlungen zur wissenschaftlichen Medizin*. Meidinger Sohn, Frankfurt
- Weinhandl F (1960) *Gestalthaftes Sehen. Ergebnisse und Aufgaben der Morphologie zum hundertjährigen Geburtstag von Christian von Ehrenfels*. Wissenschaftl Buchgesellschaft Darmstadt
- Wertheimer M (1923) Untersuchungen zur Lehre von der Gestalt. *Psychol Forsch* 4:301–350
- Ziehen Th (1925) *Vorlesungen über Ästhetik*. 2:338, Berlin

Received January 2, 1984