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Gestalt Theory: An Essay in Philosophy

§1. Introduction

The Austrian philosopher Christian von Ehrenfels published his essay "On 'Gestalt Qualities'" in 1890. The essay initiated a current of thought which enjoyed a powerful position in the philosophy and psychology of the first half of this century and has more recently enjoyed a minor resurgence of interest in the area of cognitive science, above all in criticisms of the so-called 'strong programme' in artificial intelligence.[1] The theory of Gestalt is of course associated most specifically with psychologists of the Berlin school such as Max Wertheimer, Wolfgang Köhler and Kurt Koffka. We shall see in what follows, however, that an adequate philosophical understanding of the Gestalt idea and of Ehrenfels' achievement will require a close examination not merely of the work of the Berlin school but also of a much wider tradition in Austrian and German philosophy in general.

Ehrenfels' essay of 1890 was published in the 'journal of scientific philosophy' [*Vierteljahrsschrift für wissenschaftliche Philosophie*] edited by the positivist philosopher Richard Avenarius, and we can assume that Ehrenfels' decision to publish in Avenarius' journal was influenced by the fact that his essay had been provoked by certain passages on perception in the writings of Ernst Mach, with whom Avenarius is commonly associated. The most important influence on Ehrenfels' thinking was however that of his own principal teacher Franz Brentano, and Ehrenfels belongs to an impressive list of gifted and original thinkers – including Alexius Meinong, Edmund Husserl, Carl Stumpf, Anton Marty and Kasimir Twardowski – whose philosophy was shaped decisively by that of Brentano.

It is not my intention here to go into the details of Ehrenfels' biography.[2] I shall mention only that, like so many of the leading figures

in the Gestalt movement, Ehrenfels was a passionate musician. He took lessons in composition from Anton Bruckner, and made a name for himself as the librettist of a number of Wagner-inspired music-dramas performed in Elberfeld and Prague between 1904 and 1925. Ehrenfels was Professor in the German University in Prague from 1896 to 1929 and he continued to teach there until his death in 1932. His circle of friends, students and acquaintances during this time included a number of important writers and thinkers, among them T. G. Masaryk, Franz Kafka, Max Brod and Felix Weltsch, as well as the economist Friedrich von Wieser and linguists of the Prague circle such as Nikolai Trubetzkoy. Of greatest importance for us here, however, is the fact that Ehrenfels' lectures were regularly attended by one Max Wertheimer, the same Wertheimer who was later to propound the doctrine of 'cerebral integration' which gave rise to the psychology of the Berlin school.

The importance of Ehrenfels' paper rests on the fact that it contains the first concentrated reflections on the question 'what complex perceived formations such as spatial figures or melodies might be'. This question may appear simple, yet its very formulation presupposes a degree of ontological sophistication which was perhaps unattainable before the discoveries of Brentano in the field of the ontology of mind.[3] Brentano, we might say, had set forth a means by which psychology can be made fruitful for the purposes of ontology; indeed it is this which is the theoretical core of the doctrine of intentionality for which he is nowadays principally remembered. Brentano showed his students first of all how to *notice* psychologically given distinctions – for example between the various different sorts of simple and complex mental acts, between the intuitive and non-intuitive components in psychic phenomena of different sorts, between the various different sorts of phenomenally given boundaries and continuity – but then he showed also how to take these distinctions seriously as the basis of an ontology.

Ehrenfels' friend and teacher Meinong, too, further developed the ideas on Gestalt perception put forward by Ehrenfels in the paper of 1890 and founded a school which, with the break-up of the Habsburg Monarchy in 1918, was transplanted to Padua where it has exerted some influence on Italian psychology in the subsequent decades. The present volume will pay particular attention to this Austro-Italian Gestalt tradition, which has tended to be overshadowed by the Berlin school.

The Austrian Gestalt school gave rise to a considerable literature, some of which is, I believe, recorded for the first time in the Bibliography

below. Its doctrines, which are related in a number of important respects to the work on formal ontology of the early Husserl, are also beginning to be rediscovered in current work in the area of cognitive psychology, an area in which the Austrian work on the structures of cognitive and perceptual experience may have more immediate relevance than the physiologically orientated integration theories developed by Wertheimer and his associates in Berlin.

The fact that our experience is structured is, according to the Austrian conception, a matter of certain special '*Gestalt qualities*' of complexes of data given in experience. Each such quality is determined by and is existentially dependent on the constituent elements of the complex with which it is associated. According to the later Berlin conception, in contrast, a collection of data (or any other psychological formation) does not *have* a Gestalt: it *is* a Gestalt, a whole whose parts are themselves determined as being such that they can exist only as parts of a whole of this given kind. The significance of this move cannot be overestimated. Indeed, the present essay may be seen as a treatment of the ramifications of the transition from the Austrian theory of Gestalt as *quality* to the Berlin theory of Gestalt as *whole*. The essay is intended also, however, as a first rough, historical survey of the wider Gestalt tradition – albeit from a somewhat specialized philosophical point of view – moving beyond the confines of the Berlin-centred approach that has hitherto prevailed.[4]

The essay does not deal with those early developments in the direction of a Gestalt theory which occurred independently of the work of Ehrenfels and his fellow students of Brentano. Thus I shall not, for example, deal with the work of Ewald Hering, who is, with Stumpf, the originator of many of the experimental-descriptive methods employed by the Gestaltists in Germany.[5] I shall not deal with certain related tendencies in the work of Bergson and his followers in France and of Ward, Stout and others in England.[6] I shall not deal, either, with the work of James, although passages such as the following from the *Principles* –

> *all brain processes are such as to give rise to what we may call FIGURED consciousness.* If paths are irradiated at all, they are irradiated in consistent systems, and occasion thoughts of definite objects, not mere hodge-podges of elements. Even where the brain's functions are half thrown out of gear, as in aphasia or dropping asleep, this law of figured consciousness holds good (II, p.82)

– seem to manifest a clear orientation in the Gestalt-theoretical direction.[7]

§2. Christian von Ehrenfels: The Theory of Gestalt Qualities

The essay "On 'Gestalt Qualities'" consists, first of all, in a terminological proposal. Ehrenfels suggests that the German term 'Gestalt', which means 'shape', 'figure', 'form' should be generalized in a certain way. Of course, more or less extended or metaphorical uses of this term have a long history. '*Gestalt*' is itself derived metaphorically from the Germanic '*stalla*' (a place to stand), which has the same root as the English 'stall'. There is a common use of the term to mean 'external or visible form' (e.g. of the devil, or of a ceramic pot),[8] as also a family of uses allied to English expressions such as 'cut a figure', 'Great Figures in Styrian Philosophy', and so on. The term signifies also quite generally a structure or complex, so that Clausewitz, for example, can speak of a war as an 'absolute Gestalt', an 'indivisible whole, whose elements (the individual victories) have value only in relation to the whole'.[9]

Ehrenfels, however, had a quite specific theoretical generalization of the term in mind. A spatial shape or Gestalt is perceived – or, as Ehrenfels and his fellow Brentanians would say, is 'given in visual presentation' – on the basis of a complex of sensations of individual elements having 'distinct spatial determinations'. In sensing the elements and their spatial determinations we are able to apprehend the shape as an additional object (quality, attribute) as it were side by side with its associated elements. Our total experience is therefore something distinct from the experience of a mere sum or complex of sensory elements. This is clear from the fact that we can apprehend *the same* shape (same spatial quality) in association with determinations and elements which, taken individually, have nothing in common: we can recognize the shape of a head, for example, either by looking at the head itself or by examining a drawing or shadow.

Ehrenfels' proposal, now, is that wherever we have a relation of this sort, between a complex of experienced elements on the one hand and some associated unitary experience of a single invariant structure on the other, we are to conceive this latter structure as a Gestalt, *and to understand the given unitary experience as structurally analogous to the experience of a spatial shape*. Spatial and temporal complexity (and in principle also experienced complexity of other kinds) are henceforth to be treated not as separate groups of phenomena correlated with different faculties of mind. Rather, they are to be treated as instances of a single species, in which mental processes of the same sorts are involved in every case.

Again, the air of simplicity about this proposal should not be allowed to mislead. For given the comparatively developed status of our intuitions concerning visual phenomena and the quite general manageability of spatial as opposed to temporal structures (manifested, for example, in the comparatively developed state of the science of geometry), Ehrenfels' proposal has considerable theoretical power. Indeed, the essay of 1890 gave rise to a veritable explosion of empirical and theoretical research on 'Gestalt qualities' long before the writings of Wertheimer, Köhler, Koffka, *et al.* had established 'Gestalt psychology' as an independent movement of thought.

Ehrenfels' essay is, therefore, more than a mere terminological watershed. Almost all of the theoretical and conceptual issues which came subsequently to be associated with the Gestalt idea are treated at some point in the work, at least in passing. Its specific interest here, however, lies in the generality with which Ehrenfels formulated his proposal. For even though he himself applied his idea of a generalized geometry of Gestalten in greatest detail to the specific case of our perception of melodies and similar formations, he recognized that the idea is applicable, in principle, to all varieties of experience, both perceptual and non-perceptual. Indeed, once the nature of Gestalten has been coherently established, the notion is in principle applicable to objects in general, whatever their qualitative determinations and irrespective of whether or not they serve as objects of experience on the part of actual conscious subjects.

The generality of Ehrenfels' concept of Gestalt is apparent already in his recognition that concepts analogous to that of spatial shape may be applied not merely to complex objects of perception in other sensory modalities but also to objects having a complexity that is extended in time. The Gestalt concept is then generalized further to embrace also complex objects of experience founded on *inner* perceptions, that is to say, on one's presentations of one's own elementary feelings, acts or mental states. Moods, emotions and complex feelings are Gestalt qualities on this view (where some of the followers of Mach had wanted to eliminate the notion of Gestalt as a separate category by translating all talk of structure on the side of the objects of experience into talk of special moods or feelings with which groups of elementary sensations would be accompanied).[10]

Sensory data from different sensory modalities may, according to Ehrenfels, combine together in such a way as to provide the foundation

for mixed Gestalt qualities of specific sorts. Thus our perception of wetness is in fact the perception of a Gestalt quality founded on simultaneous sensations of pressure and temperature;[11] the phenomena of complex tastes involve an 'intimate fusion' of pure taste sensations with sensations of temperature, touch and smell, and it seems plausible to suppose that truly subtle tastes will involve in their foundations also complex memories and other data given in inner perception.

Yet Ehrenfels allows not merely Gestalt qualities spanning different sensory modalities and Gestalt qualities built up on the basis of the data from both inner and outer perception. He allows also Gestalt qualities themselves to combine together in specific ways. Having identified spatial shapes, melodies, chords and complex tastes as first order Gestalt qualities founded on given elementary sensations, Ehrenfels recognizes that these qualities, too, may combine together in such a way as to found new, second order qualities which are themselves capable of founding third order qualities, and so on, in principle without limit. The most complex products of the most sophisticated civilization, including all the complex structures of language and art, are hereby comprehended within a single theory, and the stratified vision of the world of experience which this theory represents, developed further by Meinong in his theory of higher order objects, may be said to anticipate both Husserl's account of higher-order categorial perception in the 6th Logical Investigation and also Carnap's hierarchical ontology in his *Der logische Aufbau der Welt*.[12]

At the very end of his paper, Ehrenfels considers the possibility of a stratification in the contrary direction, that is to say downwards from the level of the medium-sized objects given in perception into the region of microphysics. 'Is it not conceivable,' he asks, 'that each tone is the fusion of a sum of still more primitive elements with the Gestalt qualities bound up therewith?' He goes on to conclude that,

> no conclusive argument can be brought forward even against the possibility that we may not, penetrating ever more deeply in this manner, finally arrive at a single proto-quality, or at least at a single quality-continuum, from out of which distinct contents (colours, tones,...) are generated by the fusion of distinct combinations with the Gestalt qualities bound up therewith, [so that] one can no longer shrink from the idea that tones and colours might be exhibited as the products of a much higher degree of complication of proto-elements as yet unknown. (pp.115 f. below)

Already the language of this passage suggests that Ehrenfels shared with Mach a fundamental elementarism. He held, at least from the point of

view of methodology, that the world as a whole is ultimately atomic in structure. He held also that a coherent account of the structure of consciousness would have to be formulated in terms of elementary acts and objects of experience. Unlike Mach, however, Ehrenfels drew a distinction between 'elements' and 'atoms', that is to say between unitary objects of experience on the one hand and absolutely simple constituent units of worldly furniture on the other. As already noted, Gestalt qualities, for Ehrenfels, are not wholes embracing their fundamenta – the associated tones, colours, tastes or smells – as parts. They are additional unitary objects, existing alongside the unitary elements with which they are associated. The Gestalt quality is not a combination of elements but 'something new in relation to these, which exists together with [their] combination, but is distinguishable from it'. It is a special sort of structure, 'a positive content of presentation bound up in consciousness with the existence of complexes of mutually separable (i.e. independently presentable) elementary presentations'. (p.93 below)

For Mach, whose views are discussed in more detail in the essay by Mulligan and Smith below, the only satisfactory story of the universe and of all its parts and aspects is one which is told exclusively in terms of atoms, of absolute (phenomenal) elements. All other putative entities – including not only melodies and shapes but also bodies and selves – are merely auxiliary aids introduced 'for purposes of thought economy'. For Ehrenfels, in contrast, there are also unitary entities at successively higher levels, what one might call *relative* elements or 'quasi-substances', objects which, even though they do not belong to the ultimate worldly furniture, are yet given to consciousness in a unitary way and have to be recognized as such by any adequate theory.

Thus the doctor, in observing the temperature chart, perceives the *shape* of the chart on the basis of sensations of its constituent points and lines; the shape is a unitary object of his experience and we falsify this experience if we fail to acknowledge it as such. By calling into account in perception or in imagination the associated states and symptoms of the patient, the doctor can now go on to perceive that peculiar mixed quality which is the patient's condition; this, too, is a unitary object of the doctor's experience, though one existing on a higher level of abstractness. From there he may go on, by calling into account details of the patient's past, to imagine, say, the quality of decrepitude in the life of the patient that has given rise to a condition of this sort. Here again the quality in question is a unitary object of the doctor's experience,

associated with, but not reducible to, complexes of points, lines, symptoms and events. Clearly, although the doctor's awareness of the relevant quality is in each case direct and immediate, the quality itself is such as to inherit a certain complexity from the fundamenta with which it is associated: like all Gestalt formations it is, in a certain sense, a case of unity in diversity.

There is a whole series of problems internal to the Ehrenfels theory that are left unresolved by the paper of 1890. Thus Ehrenfels describes the Gestalt quality as a 'positive content of presentation'. Is such a content a real entity, something individual and spatio-temporal? Or is it rather an ideal or abstract universal, multiply exemplified in the acts of different subjects directed towards the same foundational elements? What is the nature of the 'complex of presentations' that serves as the foundation or carrier of the Gestalt quality? Are we to acknowledge both Gestalt qualities and *sui generis* complexes which they would be the qualities of? And how is a complex of mutually separable elementary presentations related to those complex *fusions* of elements which Ehrenfels also recognizes? Matters are made worse by the fact that Ehrenfels employs the terminology of 'content', which is notoriously vague in leaving open the question whether one is dealing, when one refers to a content of a given sort, with an immanent part or moment of an act or with its object. Moreover, Ehrenfels leaves open whether the Gestalt that is the 'content' of a given act is existentially dependent on the act or such as to exist independently of it. In his "Weiterführende Bemerkungen" of 1922, Ehrenfels raises many of these problems again, offering sometimes rather cryptic replies to the various criticisms he had received in the intervening years. More coherent resolutions of these problems are however provided by Husserl, Meinong and Stumpf, and it is to their work that we must now turn.

§3. Husserl and Meinong: Moments of Unity and Higher Order Objects

3.1 Husserl, as is well known, independently developed ideas very similar to those of Ehrenfels in his *Philosophy of Arithmetic* of 1891. In chapter XI of that work, Husserl points to certain 'figural' or 'quasi-qualitative moments' whose existence is implied e.g. in our talk of a *line* of soldiers, a *heap* of apples, an *avenue* of trees, a *swarm* of birds, and so on:

In each of these examples we are referring to a sensory collection [*Menge*] of like objects, whose genus is also named. It is not only this that is brought to expression however – for that it would be sufficient to use the plural of the generic name. It is rather a certain characteristic quality [*Beschaffenheit*] of the unitary total intuition of the given collection, capable of being grasped in a single glance... which comes to expression in the given expressions (1891, pp.203f. Cf. also 1900/01, A633n., Eng. p.799n.).

Thus as for Ehrenfels, so also for Husserl, we grasp the configuration and its quality *in one glance* – not by collecting together in intuition a sum or sequence of objects or relations, as occurs in those higher order articulated acts of counting and calculating which are the principal subject-matter of Husserl's early work.

Husserl explains this immediacy by appeal to the notion of 'fusion', a notion we have met informally above. This notion, which Husserl had taken over from Stumpf, signifies simply the absence of phenomenal discontinuities or boundary lines, as for example when one perceives an array of colour in which there is a gradual transition from red to blue or a glissando in which one musical tone passes continuously into another. Husserl argues, in effect, that the swarms and heaps given in intuition are such that the relevant parts of the intuition have become fused together: the parts are such that, in this intuition, we are able to discern no phenomenal boundary lines or discontinuities between them. The *relations* between these relevant parts become thereby fused together also, giving rise to precisely that unity which is the figural moment or 'quasi-quality' in question (1891, p.206).

Husserlian figural moments come in many shapes and sizes and may contribute to the most varied mixtures and fusions (1891, p.209): a melody, for example, manifests a complex quality of this kind. Moreover, each figural moment is characterized by a complex interdependence with the constituent parts of the relevant whole:

Whenever a manifold of separate objects are given together in an intuition, the figural moments that belong to all the conceivable sub-manifolds compete with each other. When we set into relief a specific collection in intuitive unity, that figural moment steps forth which exerts the strongest stimulus on our grasping. But this victory is sometimes only momentary – we grasp now this, now that collection within the total intuition to which they all belong, according to whether it is this or that figural moment which predominates. (1891, p.210 of reprint)

Husserl did not, in this early work, go as far as Ehrenfels in recognizing

the generality of the Gestalt concept, e.g. in comprehending mixed qualities embracing elements from different sensory modalities and from both inner and outer sense. He did however manage to get clearer than Ehrenfels as to the ontological status of Gestalt qualities or figural moments, i.e. in regard to the question whether they are most properly to be regarded as individuals or universals. Such moments, Husserl argued, constitute a *species*, a space of constant and variable dimensions analogous to the different species constituted by the various sensory qualities. (p.206f.) Thus just as, for example, in relation to colour, we have families of cognate species (*red*, *blue*; *dark red*, *light red*, etc.) organized hierarchically on successive levels of a *tree* of more and less general species and genera, so also in relation to figural moments we have families of cognate species at successive levels on a tree of species and genera moving from, say, *line*, *swarm*, *star-shaped array* to e.g. *line of such and such objects configurated together in such and such a manner*, *swarm of such and such objects configurated in such and such a manner*, and so on. At the very bottom of the tree are *lowest species* in which all variable dimensions have been made determinate. Necessary laws or principles – in many ways analogous to the principles of geometry – will then govern species at the various different levels, determining their possibilities of mixture and combination and their compatibility with different species of underlying elements.

What we actually see or hear on a given occasion, however, is not the species but some particular *instance* thereof, an *individual* figural moment. This we apprehend as an instance of this or that figural species in virtue of the similarity (or, in the ideal case, qualitative identity) which it bears to individual figural moments apprehended on other occasions and with other associated elements.

From this it follows, however, that there are two distinct respects in which we can apply the universal/singular opposition within the theory of figural moments, that our consideration of figural moments is subject to two distinct dimensions of variation. We have on the one hand a dimension of variability reflecting qualitative differences among the figural moments themselves, taken *in specie* (differences of position upon the tree). And on the other hand we have also a dimension of variability reflecting differences in the species of their underlying elements (and therefore also of the associated perceptual acts).

Husserl's theory of species and of moments is further refined in the *Logical Investigations* of 1900/01, especially in the context of the theory

of dependence or foundation put forward in the 3rd Investigation.[13] The Gestalt problem is, in effect, a problem of unity, and Husserl here argues that unity can come about in two distinct ways. Either given objects are such that – like nuts and bolts, or adjacent pieces in a jigsaw – they do not need any additional objects in order to fit together to make a unified whole. Or they are such that – like two pieces of wood which need to be nailed together – they are not in themselves sufficient to make a unity but can be unified only given the presence of some additional object (LU III,§§1f.). Such unifying objects may be of two sorts: on the one hand they may be independent objects like a nail or a mass of glue, capable of existing in separation from a whole of the given sort. On the other hand however, and more interestingly, they may be *dependent* objects, capable of existing only in consort with the objects they serve to unify. Husserl calls such dependent unifying objects 'moments of unity' (a term suggested by Alois Riehl), at the same time moving beyond his own earlier position – dictated, again, by the confusing term 'content' – according to which unification takes place always on the side of consciousness. Moments of unity, he says, are

> nothing other than those contents which were referred to by Ehrenfels as 'Gestalt qualities', by me as 'figural moments' and by Meinong as 'founded contents'. But there is needed here the supplementary distinction between the *phenomological* moments of unity which give unity to the psychical experiences or experience-parts, and the *objective* moments of unity, which belong to the intentional and non-psychical objects and object-parts. (1900/01 A230f., Eng. trans. p.442.)

This distinction between phenomological and objective moments of unity is important: it signals the fact that Husserl has finally cut himself free from the unclarities dictated by the terminology of 'content'. Examples of unifying moments in the objective sense might be the copula of a sentence; the treaty of an alliance; the current flowing through a computer (without this flow, the various pieces of the computer would be just so many separate constituent bits).

Examples of 'phenomenological' unifying moments might be the moment of assertive force in an assertive judgment, or the 'ego', conceived merely as a moment of unity spread out through time in such a way as to be dependent upon the successive mental acts or states of a given person.

But we may consider also moments of unity which bridge the 'phenomenological' and 'objective' spheres. Consider, for example, the

anger underlying a complex facial gesture (it is this which gives unity to what would otherwise be a heap of simultaneous muscular contractions). Or consider the intended or entertained end or purpose underlying some chain of actions on the part of one or several persons (actions which would, in the absence of such an end, resolve into just so many separate pieces of behaviour). Our mental acts themselves, for example our acts of perception, may also be regarded as moments of unity, serving to constitute a transitory but nevertheless real unity between a subject and a perceptual object.[14] Of course, when John is thinking, abstractly (or abstractedly), about, say, elephants, then there is no real unity constituted by him and any members of the elephant population. But when, in contrast, John sees some *specific* elephant by which he is confronted, then we may say that he is unified with the object of his act – he and the elephant do not simply co-exist, but are in fact related together in a single unified whole.

3.2 A somewhat different step in the direction of a coherent general conception of the ontological status of Gestalten was made by Meinong in a series of works written in the 1890s, in part in response to Ehrenfels' paper of 1890. Meinong moved, first of all, from the idea of side-by-sideness shared by Ehrenfels and Mach, to an explicit conception of the Gestalt as *above* the founding elements. Thus in his 1891 he talks of Gestalten as 'founded' and 'founding' contents, and of a difference of level between the two.

He then however moves one stage further, in part under the influence of Twardowski. He moves from talk of 'founded contents' to talk of 'objects of higher order' (see especially his paper of 1899). The examples which played the most important role in motivating Meinong's discussion here were the different sorts of relations, above all relations of comparison, identity, difference, similarity, and so on. We cannot, Meinong argued, *see* the 'difference' or the 'similarity' between two colours in the same sense in which we can see the colours themselves. Similarly we cannot *see* higher order objects such as geometrical shapes, velocities, distances. For such objects are *ideal*, like numbers and concepts, that is they are outside space and time, and what is outside space and time is not capable of being grasped in acts of sensation. Hence Meinong did not follow the broadly Aristotelian view – a view that is at least suggested by the work of Husserl – according to which relations and like formations can be considered in two distinct ways: either *in specie* or

as individual spatio-temporal instances (see Smith (1984)). Rather he transferred such formations out into an entirely abstract domain, a domain of Platonic irrealia.

In the paper of 1899 Meinong extends the idea of objects of higher order in the direction of an all-embracing stratified ontology.[15] For Meinong, however, as also for Ehrenfels and Husserl, it remains the case that the world of experience is divided into two categorially different sorts of entity, each correlated with its own peculiar sort of mental act. We might compare this dichotomy with the classical division between matter and form. The *matter* of experience is conceived as being constituted by the data given in supposedly simple sensory acts, all of which are discrete and independent, i.e. are such that each can exist in principle in isolation from all others. The *form* of experience is conceived as being constituted by special categorial objects given in non-sensory intellectual acts.[16] Only with the Berlin school will this two-storey ontology be seriously questioned.

§4. Carl Stumpf and the Natural Philosophy of Gestalten

4.1 That Brentano's most important students manifested an unparalleled philosophical power and originality is a thesis that has been advanced in passing already above. The thesis applies not least to Carl Stumpf, though Stumpf's work in the field of philosophy is less well known than that of, say, his own student Husserl.[17] Stumpf's central idea of phenomenal fusion we have met already: it reappears in a number of authors as a means of accounting directly for the phenomena of Gestalt perception without the need for an appeal to special kinds of objects. Stumpf's own account of such phenomena is however characterized by an anti-reductivist, descriptive attitude, which represents an attempt to produce what we might call a natural philosophy of the entire gamut of complex experiences, including not only the phenomena of fusion and purely aggregative phenomena but also a range of different sorts of Gestalt phenomena considered as lying between these two extremes.[18]

Stumpf distinguishes, first of all, complex and Gestalt. The former is a whole of (e.g.) sense contents; the latter is a relational attribute, a whole or network of relations between sense contents (1939/40, p.229). This network is somehow unitary: when we hear a chord or a melody we hear a

relational whole, not a complex or succession of dyadic relations. Gestalten are 'transposable' in the sense that the same network of relations can, under certain conditions, be transferred from one complex of relata to another. But now, Stumpf argues, this implies that there is something *cognitive* in our awareness of that specific structure which is a Gestalt. For to grasp a Gestalt is to grasp not merely an individual as such but also that abstract net of transferable relations which is its essence (*op.cit.*, p.242).

Gestalten in this sense can never be perceived of themselves but always only in and of some given *formed material*. More precisely, a Gestalt always presupposes some articulated whole in which there are distinct parts which are capable of being grasped as such. A unitary fusion, lacking in all articulation or phenomenally recognizable internal boundaries, is not capable of serving as foundation for a Gestalt relational network as Stumpf conceives it. Thus a tone or phoneme or timbre may involve physical or physiological complexity, but it is phenomenally (psychologically) non-articulated, and therefore has no Gestalt. This implies a distinction between 'whole-properties' such as 'smooth', 'rough', 'cloudy', 'trumpety', 'percussive' etc., which can apply to wholes in general, and 'Gestalt-properties', which can apply only to articulated wholes.[19]

Thus Stumpf, too, accepts a dichotomy of Gestalten and founding elements. Hence he cannot accept a view of the sort advocated by Wertheimer, Köhler and Koffka according to which sensations are mere abstractions from Gestalten given in experience, so that it is Gestalt phenomena alone which are primarily given (in every sphere). This is first of all for ontological reasons: the Stumpfian Gestalt presupposes an articulation into parts between which there may then exist relations of an appropriate sort. But it is also for reasons of phenomenology: we do not hear the melody or see the figure in the same way that we hear an individual tone or see a coloured fleck, for in the latter there are no differentiatings at work and no intellectual awareness of identity. (pp.246f.)

Stumpf's position is however strong enough to admit that, as a result of inadequacies or other special conditions on the side of the subject, the Gestalt articulation demanded by his theory need not in fact be realized in every case. Thus he is prepared to accept that we often see Gestalten without recognizing parts, that sometimes it takes effort to delineate figures with their ground, to discriminate constituent parts. (p.247) He is

prepared to accept that a musical tone sounds different when isolated from the way it sounds when occurring in a specific position within the context of a melody, e.g. as the dominant of a minor key. But he insists that the fact that a sensory element changes from one context to the next cannot at all count against the thesis that such elements exist, that a melody consists of tones, a landscape of colour-patches, and so on. Indeed the effect of much music consists precisely in the fact that the *same* tone in a different context can suddenly gain a quite new significance. Then, however, it is the *role* or *function* of the tone in the given context that is changed, not the tone itself (and from Stumpf's point of view it is characteric of the later Berlin school that they have been too much tempted to run these two together).

A Gestalt is a whole of relations, but in certain circumstances only part of this whole may be perceived – and this part may be a Gestalt in its own right. Indeed it is only in certain simple cases, for example simple visual patterns, that the entire Gestalt can be perceived in one intuitive glance. In more complicated cases this is not possible, and the greater the manifold of relations between the parts of a given field the less is it possible to grasp all relations simultaneously. We can grasp the Gestalt only if we are somehow able, by a cumulative process involving the operations of memory, to unify everything in one *intellectual* glance, and a discursive process of this sort is indeed indispensable if we are to grasp a melody or any other Gestalt involving any sort of temporal succession.

4.2 As one would expect from a philosopher-psychologist who was responsible, with Helmholtz, for establishing the scientific credentials of the nascent discipline of the psychology of music, it is to aural phenomena that the Stumpfian natural philosophy of Gestalten is applied in greatest detail. Stumpf considers, in particular, the conditions which must be satisfied if a sequence of tones is to possess that specific sort of Gestalt which we call a melody. Such a sequence must, first of all, have a *sense* for the hearer, a notion which Stumpf explicates by developing a comparison between that reference system which is a given tonality and the reference system which is e.g. a language. It must, secondly, have a more or less definite rhythm (and this is for many melodies more characteristic than the mere interval-sequence). It must be a relatively self-contained whole or formation, not part of any continuation. And it must be non-decomposable: its parts must be non-independent Gestalten, not themselves capable of existing as musical categoremata in their own

right. A melody is then 'an intelligible, discrete-successive, non-decomposable aural Gestalt having a determinate rhythmic structure and capable of existing on its own' (p.270). 'Intelligibility' here involves not only surveyability of rhythm, but also recognition of dominant, tonic, leading note etc., in a process parallel to the recognition of the different parts of speech in a spoken sentence. This in turn presupposes the interiorization of the tonal system, for hearing a melody is hearing with the contribution of intellectual functions. Who, Stumpf asks, would say that someone had *heard* a sentence who did not speak the language in which it was expressed and therefore grasped only a sequence of sounds? (p.272)

Stumpf distinguishes also however between *understanding* or apprehending a melody and the somewhat different processes which are involved in its aesthetic *enjoyment* (as understanding a sentence is somewhat different from the enjoyment of a poem). One can apprehend the Gestalt of a melody only when one has heard the entire sequence of tones in such a way that a total impression has been gained through a discursive process. But the effect of the melody on our feelings does not begin only after it has been completed: we follow it through in its development from the very beginning, accompany this development with expectations, surprises, tensions, releases, for which the foundation is provided by repetition, similarity of strophes, *crescendi* and *diminuendi* etc., and these experiences then serve as the foundation for movements of feeling whose colouring is further determined through the purely sensual feeling-sensations [*Gefühlsempfindungen*] by which they are accompanied. 'How the past hereby works together with the present, how every new tone is co-determined in its character by all its predecessors, this is something the psychologists have to be left to determine, if they are capable of this at all.' (p. 273)

§5. The Graz Production Theory: From Benussi to Kanizsa

5.1 We have so far left open the question of the genesis of Gestalt qualities, Ehrenfels' own views on this matter being considered in detail in the paper by Mulligan and Smith below. Is the Gestalt quality such as to exist spontaneously as an object of experience, given only that an appropriate complex of elements is present in succession, as Ehrenfels (and Mach) believed? Or is the perception of the Gestalt quality the

result of intellectual activity, as if it would have to be *produced* by the perceiving subject? It is above all Meinong and his followers who have taken this second line, identifying higher-order Gestalt formations as products of cognitive or intellectual processing and thereby giving birth to what has been called the 'production theory' of Gestalt perception.[20]

In insisting that Gestalten owe their existence as objects of experience exclusively to a specific activity of 'production' on the part of experiencing subjects, the members of the Graz school drew on Meinong's earlier division of objects of experience into 'real', and 'ideal' objects, arguing that only the former can be experienced directly in sensation. If we have presentations of the latter, which are outside space and time, then the source of these presentations cannot be an affection of the senses; hence there must exist some other, non-sensory psychic activity which makes such presentations possible: this is precisely the activity of production.

It is in the work of Vittorio Benussi that the production theory receives its most detailed exposition and its most elaborate experimental support, even though he himself, in his later writings, saw reason to distance himself from the idea and terminology of production.

For Ehrenfels human ingenuity can invent ever new and more complicated types of Gestalt qualities by finding new ways of combining together elements and complexes of elements on successive levels. If the elements are combined together, however, if they are juxtaposed, whether spatially or temporally, then the corresponding Gestalt quality simply exists, in entirely determinate fashion, and in such a way that the relevant sensory presentations cannot occur together in consciousness without there occurring also a presentation of the associated Gestalt. For Benussi, in contrast, Gestalt presentations are brought about indirectly on the basis of stimulus-presentations; they are therefore characterized by a certain *ambiguity* in relation to the stimulus, are underdetermined by the lower-level experiences on which they are founded:

> the totality of that which comes to be apprehended internally through the mediation of the eye, i.e. through a certain organ of sense... does not unambiguously determine those phenomena, objects, appearances, or whatever one wants to call them, which are grasped, presented or taken hold of with and in part through the awakening of all these impressions. (1914 a, p. 399)

Thus consider for example our experience of a succession of tones. It seems that, through a little intellectual effort, we can hear the relevant

sequence as divided into phrasal clusters now in this way, now in that. Or consider our experience of visual illusions such as the Necker cube, Rubin's vase/faces illusion, the duck-rabbit illusion, and so on. The same founding elements here give rise to different Gestalt qualities under different conditions, sometimes in such a way that the qualities produced alternate in a manner over which the subject has no control. This 'Gestalt-switch' phenomenon is perhaps the one concern most generally associated with the Gestalt tradition, though it is less commonly recognized that it was Benussi who was the first to subject it to detailed treatment, both theoretically and experimentally (and indeed that the notion of Gestalt ambiguity is at the very centre of the Graz production theory).

For Benussi, then, it was not the 'ideal' nature of Gestalt objects which was of principal concern, but much rather their ambiguity – a characteristic which is lacking, he held, in purely sensory phenomena. It was the fact that on the basis of the same stimulus conditions different presentations of Gestalt qualities can be won which led to the conclusion that there must exist a special kind of non-sensory mental process, an 'extra brain level', which could explain the sometimes complex and subtle resolutions of Gestalt ambiguity which occur from case to case.

Experience has its roots in sensory presentations which are 'without remainder bound to the stimulus'.[21] When an act of *production* is carried out on the basis of sensory presentations, the contents of the latter are somehow collected together or ordered, are 'brought in real relation to one another'[22] in such a way as to give rise to a new 'extra-sensory' object which then serves as the object of a higher level Gestalt presentation.

This new position was given support by the fact that – as the Meinongians were able to establish in a number of detailed experiments – our capacities to grasp Gestalten may differ over time, the facility to perform acts of production may be affected by experience and by training. Sensory experiences, too, may of course suffer from a characteristic *sensory* inadequacy of their own, as is illustrated for example by the case of colour-blindness. Sensory experiences may, in other words, suffer a departure from the normal, law-governed dependence relations between stimulus and sensory presentation, and such sensory inadequacy will lead to illusions in virtue of the fact that we will tend, on any given occasion, to make judgments on the basis of the

assumption that our current sensations conform to law. Sensory inadequacy is however – or so Benussi argues – involuntary, objectively conditioned, and such that it cannot be eliminated by practice, all features in which it differs from the inadequacy involved in our presentation of Gestalten. The latter can be affected, e.g., by the exercise of attention; it depends on *inner* conditions, and can be mitigated through practice. Further, Gestalt presentation on the basis of a given structure may sometimes not take place at all (1904, pp.307f., 410). The subject can deliberately *suppress* the process of production, which brings us to another element of the Graz theory, dealt with in particular by Benussi's colleague Witasek: processes of production are *subject to the will.*

Benussi holds that quite definite sorts of inadequate presentation of Gestalt qualities can occur even where the founding elements are brought to presentation in a way that is perfectly adequate. The inadequacy of Gestalt presentations is related in every case to different sorts of anomaly in the production process. That is to say, variations in our experience of Gestalten are conceived purely as a result of the intellectual activities of the psychic subject. Only gradually, as we shall see, was it recognized that the variations in question may be accounted for, in whole or in part, in terms of the state of the perceiving organism and in terms of other conditions in the objective sphere.

5.2 Benussi himself gradually adopted a different and more subtle view on complex perception, a view which is comparable in some ways to the position of the later Husserl.[23] According to this later view, presentational experiences can no longer be divided sharply into sensory and non-sensory. Rather, we have a spectrum which extends from cases of perception in which the influence of non-sensory factors ('central conditions') is very strong, to cases of high influence of 'peripheral conditions' in which such influence is negligible.[24]

Benussi established a tradition of experimental psychology in Italy which, through the work of Musatti, Metelli, Kanizsa and others, is still alive today, producing valuable results for example in the investigation of perceived plurality, of transparency and of subjective contours. The work of this contemporary Italo-Austrian tradition can best be gauged by looking at the investigations on vision carried out by Gaetano Kanizsa.[25] As will become clear, Kanizsa's work represents a refined and modernized variant of the old Graz two-storey model, though from a perspective dictated, now, both by influences stemming from the Berlin

school and also by opposition to present-day cognitivist views on perception.

Kanizsa is concerned particularly with the processing that is involved in our ordinary visual perception. On the basis of a series of extremely sophisticated experiments of a phenomenological sort – they are experiments involving figures and drawings in relation to which anyone can easily convince himself of the accuracy of the descriptions advanced – Kanizsa has sought to uphold our common-sense understanding of the opposition between *thought* on the one hand and *perception* on the other.

Cognitive theorists from Helmholtz onwards have, as is well known, done their best to eliminate this opposition from psychological theory by conceiving perception as a form of thought, as involving one or other variety of 'unconscious inferences'.[26] Kanizsa is willing to grant that perception and thought are, in a certain sense, only abstractly distinguishable dimensions of that complex process which is the interaction of a conscious subject with its environment (to this extent he agrees also with the members of the Berlin school). But he does *not* admit that this sanctions a running together of the two, and nor, *a fortiori*, does it sanction their confusion. Perception does undoubtedly involve cognitive aspects: we perceive reds and greens, swallows and tulips, not raw data lacking all categorization. But there is something like a raw cue nonetheless (retinal stimulation *is* involved in visual perception), and then the question arises as to the precise nature of the processes involved in passing from this raw cue to the organized, categorized objects we actually perceive.

We want to establish, that is to say, the processes which are involved when the optical system transforms

> an unrelated set of elements (which theoretically could be unified in an infinite number of ways) into a certain number of segregated units with precise spatial and temporal relationships of similarity, size, functional dependence, and so on. (1979a, p.5)

For the fact that we can talk of organization and categorization here does not by any means imply that we are dealing with processes identical to those processes of 'classifying, analyzing, forming hypotheses, verifying them, and making decisions' that are involved in thinking proper (*op. cit.*, p.3). One can indeed demonstrate experimentally that the optical system has its own peculiar means of processing and organizing the proximal data – and Kanizsa here points specifically to a range of processes of what

might be called 'perceptual interpolation', processes taking place *within the optical system itself* 'of totalization, of completion, of integration, of "filling in the gaps" – that is, of making present that which is absent' (*op.cit.*, p.6), which take place prior to or independently of the properly cognitive processes of inference, comparison and categorization.

Such perceptual interpolation may be either *modal* or *amodal*, i.e. the filled in parts may either 'have the characteristics of visual modality and [be] phenomenally indistinguishable from those that have a counterpart in the stimuli', as for example in certain types of stroboscopic movement, or they may enjoy a 'perceptual existence... that is not verified by any sensory modality' (*loc.cit.*). The classic examples of such amodal completion are effects such as those of the tunnel studied by Albert Michotte and his followers.[27] But amodal completion is involved, for example, in figure-ground segmentation, a fundamental fact

> in the construction of the phenomenal world, in which the articulation always implies the completion (precisely amodal) of the continuous background existing behind the figure. And not only does every phenomenal object taken as a figure appear against a background amodally present behind it; it also possesses, phenomenally, its own back side. Although not visible, this posterior part is nonetheless phenomenally present. Indeed, this part does not have an arbitrary form that can be modified by the imagination (Tampieri 1956). Moreover, every phenomenal object seen three-dimensionally has an interior. This, too, is a real phenomenal presence ("encountered", not simply "imagined"), even if amodal. (*Loc.cit.*)

The process of interpolation on the part of the optical system must therefore be considered not as a special case but rather as the norm of visual perception.

Why, now, must we accept, with Kanizsa, that the 'logic' of these processes is not the same as the logic that the mind employs in making inferences? It is here that Kanizsa's experimental phenomenology comes into its own. By opposing cases where perceptual interpolation takes place – where we directly *see* the completions that have come about – with cases of otherwise almost identical figures where it is cognitive interpolation that is demanded, Kanizsa is able to show that the concepts of 'complete' and 'incomplete' (or e.g. of 'completable' and 'incompletable', of 'possible' and 'impossible') are quite different according to whether we are dealing with directly given perceptual phenomena or with the results of cognitive processing.

§6. Causality, Emotions and Gestalt Linguistics

6.1 An opposition very similar to that investigated by Kanizsa is present also in our experience of causality. Thus there are cases where we *see*, directly, a causal connection between one event and another, and other, quite different sorts of cases where such connection is inferred in properly cognitive processes. The perception of causality, too, has been investigated by Gestalt psychologists, most especially by Albert Michotte in Louvain, another thinker under the influence of both the Graz and Berlin schools, and it is to his work that we must now turn.

Michotte's experiments, too, rest on a surprisingly simple idea, but one which has important consequences for our understanding of the ways in which objectual structures are encountered in perception. One starts with two small coloured rectangles – A and B – which are moved in sequence behind a horizontal slot, the movements being interrupted in different ways and changed in direction and speed from case to case. Michotte discovered that certain sequences of such movements gave rise to quite specific impressions on the part of the perceiving subject. The latter may, for example, have an impression that A *causes* B to move, that A is *going towards* B, that A is *pursuing* B, that A *joins* and *unites itself* to B, that A *bumps* B, *chases* or *repels* B, *goes to find* B, *throws* B, and so on.

Events of this kind Michotte calls "functional connections" 'in order to stress that one actually *sees* some change occurring in an object "in function" of another'. (Michotte 1950b, p. 129 of reprint) As in the case of Kanizsa's phenomena of perceptual interpolation, so also here, the 'seeing' involved is amodal – no specific sensory stimuli are involved – yet it is nonetheless a direct perceptual experience, a matter of immediate 'encounter'. Michotte's experiments and the experiments of his followers show that such apprehension of 'causality' is not a result of cognitive processing in the standardly accepted sense, and nor is it a reflection of meanings or expectations learned through association or experience.

The relevance of Michotte's work to Humean theories of causality will be obvious. Michotte demonstrates the baselessness of Hume's assertion that causality is not perceived, by revealing the precise conditions under which there occur perceptions of a range of different types of causality (as also of materiality, permanence, etc.).[28] We do not see the one ball cause the other to move either because we intuitively apprehend a fact of nature or because past experience leads us to see the event in this way, but

because the specific spatio-temporal organisation is such that it directly unleashes this impression in us.

The perception of causality and of functional connections in general may be extremely sensitive even to slight changes e.g. in speed or duration of contact between the objects involved, and we are in fact dealing here with a family of quite specific varieties of Gestalt structure, instances of which are found not only in the artificial circumstances of Michotte's slots and moving rectangles but also in the perceptual world of everyday experience. This leads, however, to a crucial extrapolation of the initial idea. For perceptual Gestalt structures of the given sort can be shown to embrace also certain features characteristic of emotional phenomena. As Michotte himself points out, in certain of his experiments the subjects provided more than mere objective descriptions of the form 'A moves towards B' etc., but manifested a

> tendency to complete these indications by comparisons with human or animal actions, comparisons which implied emotional states, attitudes, tendencies attributed to the objects. The letters A and B did not then signify the little rectangles as such, but took on the value of names of persons, and the experiments gave rise to interpretations of this nature: 'It is as though B was afraid when A approached, and ran off'; or 'A joins B, then they fall out, have a quarrel, and B goes off by himself'; or again 'It is like a cat coming up to a mouse and suddenly springing on it and carrying it off.' (1950b, p.130)

Michotte argues that such perceptually given phenomena throw light on the Gestalt character of actual human emotions. For our awareness of such emotions is of course based on perceptions of facial and bodily movements, or of the relative movements of human beings interacting together.

Thus when A moves towards B this may tend to give the impression of emotionally positive relations; when A moves away from B this may tend to give the impression of relations of a negative sort. Rapid movement leads to the attribution of emotions of a violent nature, a sudden slackening of speed to the attribution of hesitation or indecision, sudden variations of direction to the attribution of nervousness or agitation, and so on. The relative movement can also – depending on the speed of approach, duration of contact etc. – lead to the attribution of a violent clash, of striking or simple touching, of anger, of agreement followed by separation, of violent carrying off, and so on.

Closely related ideas concerning the 'attribution' of emotions on the

basis of perceived relations have been developed also by Fritz Heider, Meinong's last doctoral student in Graz, who was, like Michotte, influenced by the work of the Berlin school. Heider in fact uses such ideas as the basis for a psychology of interpersonal relations. (See his 1958.) He points out in particular that our perception of emotions is allied to our perception of causality in the fact that both involve structures of the same sort, manifesting on the one hand kernels, centres or origins, and on the other hand dependent or reactive or passive parts. The dependent or inferior levels in perception then have the causal character of *mediation*: they serve the function of assisting our cognition of the superior elements. The dependent elements (persons) are given as having the character of being *moved by* the active parts. H. H. Kelley, in particular (see his 1971), has developed the theory of attribution in the direction of a taxonomy of the different kinds of causal attributions that are involved in our constitution of the animate and inanimate world.

6.2 Natural language, now, has developed precisely in reflection of the need to express such attributions in relation to those basic varieties of action and connection in the world which people our experience. This suggests that it might be possible to use a taxonomy of the most common and of the most primitive types of attribution as the foundation for a theory of the semantic structures of the corresponding utterances. This idea has been pursued, on the basis of the writings of the great French topologist René Thom, first of all by Jean Petitot and then by Wolfgang Wildgen. Their works suggest an account of language which, in contrast to the more narrowly logical approaches to semantics of recent times, has the capacity to embrace within a single framework also the cognitive and perceptual processes associated with our acts of language use. The topological basis of Thom's morphodynamic theory suggests that it is possible to do justice within this framework to, for example, both continuous and non-continuous phenomena of linguistic change and variation. Thus Petitot (1984) has used Thom's ideas to generate a provocative taxonomy of the types of transitions that occur when mere noise is heard as meaningful sound.[29]

The Thomists embrace explicitly a theory of Gestalt linguistics, as contrasted with the 'linear' models of more orthodox semantics which are seen as resting too narrowly on the notion of concatenation.[30] The theory takes as its starting point a three-level structure of (i) uses of language, (ii) associated experiences, and (iii) objects, events or processes in the world

to which these experiences relate. Consider, to take a first and very crude example, that pattern which is involved in our use of a transitive verb of action in a sentence like 'A hits B'. This same pattern is somehow present also, one might reasonably suggest, in our experience of A's hitting B. And it is present further in the momentary objectual configuration of A and B itself, which makes the given sentence true. That we are not dealing with simple concatenations of elements on this third level is clear (it is not as if A, B, and the hit would be compounded together in any merely summative fashion). Rather, we have a specific Gestalt, constituted out of two stable and enduring entities (agent and patient), and a peculiar transitory dynamic structure that holds between them. But simple concatenation is not present either – surface appearances to the contrary – in the linguistic and cognitive or experiential encodings of this objective Gestalt. Thus that moment of the sentence 'A hits B' which is expressed by 'hits' is not a simple detachable unity, but a complex repository of semantic information around which the sentence as a whole is built.

Thom's morphodynamics is a theory which provides a mathematical means for generating a taxonomy (morphology) of the different kinds of stability and instability which dynamic structures may involve. This taxonomy can be exploited as a means of providing an arsenal of abstract patterns or 'propositional archetypes' to be employed in semantic analysis. These propositional archetypes are realized by different languages in different ways, sometimes via cases or via prepositions, sometimes lexically, sometimes via a mixture of all of these. Yet one can assume that all natural languages – and all associated systems of cognitive/perceptual processing – will have some means of bringing to realization at least the most basic archetypes, since these correspond to the most commonly encountered structures of actions and events in the world of experience. The advantage of Thom's work for these purposes is that his theory is a *morphological*, that is to say a *qualitative* theory. As Wildgen points out, it furnishes us with a range of 'very rough and qualitative pictures of natural processes' (1982, p.24) which are yet amenable to mathematical treatment.[31]

Thus the theory distinguishes between stable entities (points, or regions) and discontinuities or catastrophes of different sorts which may connect these stable entities together or represent a move from one to the other. Stable entities in the sphere of linguistic Gestalten are, for example, pronouns, nouns, names; in the sphere of experienced structures they are, for example, individuals, natural kinds, enduring

states. Catastrophes in the sphere of linguistic Gestalten are 'verbs and other expressions designating the kernel of a Gestalt (relational terms, terms with strong valence)' (*op.cit.*, p.26); in the sphere of cognized structures they are for example *events* (changes of state, position, quality) and *actions*.

If we examine, now, the various primitive ways (involving at most two agents) in which stable entities and catastrophes may be interrelated, then this gives rise – or so Thom argues – to sixteen basic Gestalten:

> every process described by linguistic means refers to domains in space-time, bounded by catastrophic hypersurfaces which play a privileged role: these are the *agents* [*actants*] of the process... if two such agents interact, we must suppose that their domains of existence come into contact in a beach of catastrophe points... [such that] the interaction... corresponds to one of the sixteen archetypal morphologies given in the table below (quoted by Wildgen 1982, p.30f.).

We can illustrate some of the basic Gestalten in this table, in a somewhat simple-minded manner, as follows:

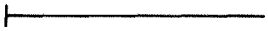
(1) **to be:**

(Stable existence, no catastrophe of any kind: no creation, no destruction.)

(2) **to end:**

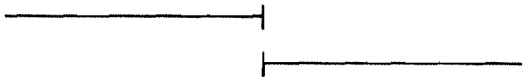
(Stable existence followed/terminated by one catastrophic change.)

(3) **to begin:**



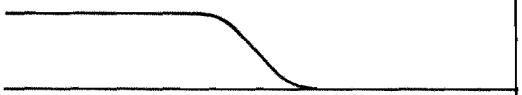
(Stable existence preceded/initiated by one catastrophic change.)

(4) **to change:**



(Sudden departure from one stable domain and entry into another.)

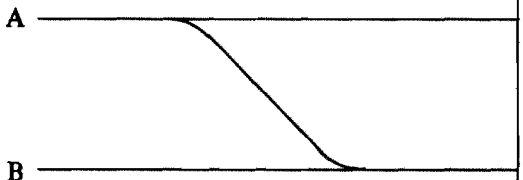
(5) **to capture:**



(Here there are two stable domains, an agent and a patient, and a single catastrophe consisting in the destruction of the latter, its merging into or envelopment within the domain of the former.)

(6) **to emit, to give birth** (reversal of (5))

(12) **to give:**



(Something which is at first caught up within that stable area which is A, moves to a position where it is caught up within that stable area which is B.)

The parallels with Michotte here will be obvious. The advantage of Thom's theoretical approach is that – where Michotte had produced merely a somewhat arbitrary listing of 'functional connections' – Thom 'allows us to *derive* propositional Gestalts from process patterns with the help of systematic principles of interpretation.' (Wildgen 1981, p.810) The idea, now, is to project the restricted number of dynamic schemata revealed by Thom not merely into the space of linguistic utterances but also into that basic set of experienced structures in the world to which our language-using acts are related, and Wildgen shows how the various basic archetypes can, in combination, be used to represent the structures of a wide range of sentences considered from a series of different perspectives.[32]

The interest of Thom's work from our present point of view is that, in contrast to the too abstractly formal investigations of the Graz school, it provides a material ontology of a range of different types of *naturally occurring* Gestalten. Moreover, it is not restricted to certain privileged perceptual (or syntactic, or computational) examples, but seems, rather, to be general enough to be able to throw light on the structures of experience in the widest sense, both perceptual and cognitive, both linguistic and non-linguistic.

§7. From Graz to Berlin: Koffka vs. Benussi

7.1 In a series of classic experiments on phenomenal motion carried out in 1912, Wertheimer discovered that when subjects – his subjects in the present case were a certain Dr. Köhler and Dr. Koffka – are exposed to two alternately flashing lights a short distance apart, then under certain conditions they have an experience of movement back and forth from the one to the other. That is to say, they *see* a movement: the movement is an object of perception, it is not a purely intellectual product of an act of production. Indeed in certain determinate circumstances one can experience *pure* phenomenal movement, that is movement without objects moved, what Wertheimer called the 'phi-phenomenon'.

The phi-phenomenon is clearly and repeatedly observable. It is no less manifest than for example a colour or shape. Yet clearly, what is perceived is not here a matter of any discrete and independent sensory data: what one perceives is, as Wertheimer says, a certain *sui generis* dynamic character of 'across'.

Wertheimer's own initial understanding of the phi-phenomenon seems to have been neurological: phi-phenomena are to be explained in terms of certain functional connections or integrations at the cortical level, functional connections held to be sufficient to provide an explanation in and of themselves, without any appeal to an 'extra brain level' of production or of intellectual processing as on a Graz-type production theory. This idea of cerebral integration signifies a final break with the atomistic sensationalism which had still made itself felt in the work of Ehrenfels, Meinong, Benussi and their followers. Wertheimer's experiments make it clear that it is not the case that to every part of a perceived structure there corresponds one or more sensory datum which could in principle be experienced in isolation. What we perceive are, rather, complex Gestalten, only some of whose parts bear a certain analogy to the putative discrete and independent data of sense which had formed the basis of the earlier theories.

Wertheimer does not, however, express this theory in any systematic way in his paper on motion of 1912. He merely 'sketches a hypothesis' (§21). Nor does he exploit his theory as a starting point from which to criticize in detail other work on phenomenal motion in such a way as to set into relief the peculiarities of the new approach. It is in fact in a paper by Koffka of 1915, a paper which has been described as 'the birth piece of Gestalt theory as a psychological system' (Ash 1982, p.338), that this theoretical and critical work is first laid bare. The paper in question is an extensive critique of the views on phenomenal motion of the Graz production theory, particularly as presented in the work of Benussi, together with the presentation of the alternative theory put forward in outline by Wertheimer.

Benussi, as we have seen, holds that Gestalt perception involves sense-activity plus a special psychic operation. Different Gestalten can be founded on the basis of the same inferiora, the latter being the same both as stimulus and as conscious content.[33] But in order to counter the objection that the operations of production are not themselves manifested in conscious experience, such operations are held by Benussi to occur *automatically* with the experience in sensation of the underlying foundations.[34] To this extent, however; their very existence eludes introspective verification and, as Koffka argues, they threaten to become theoretically idle.

Koffka's principal challenge however relates to the putative 'purely

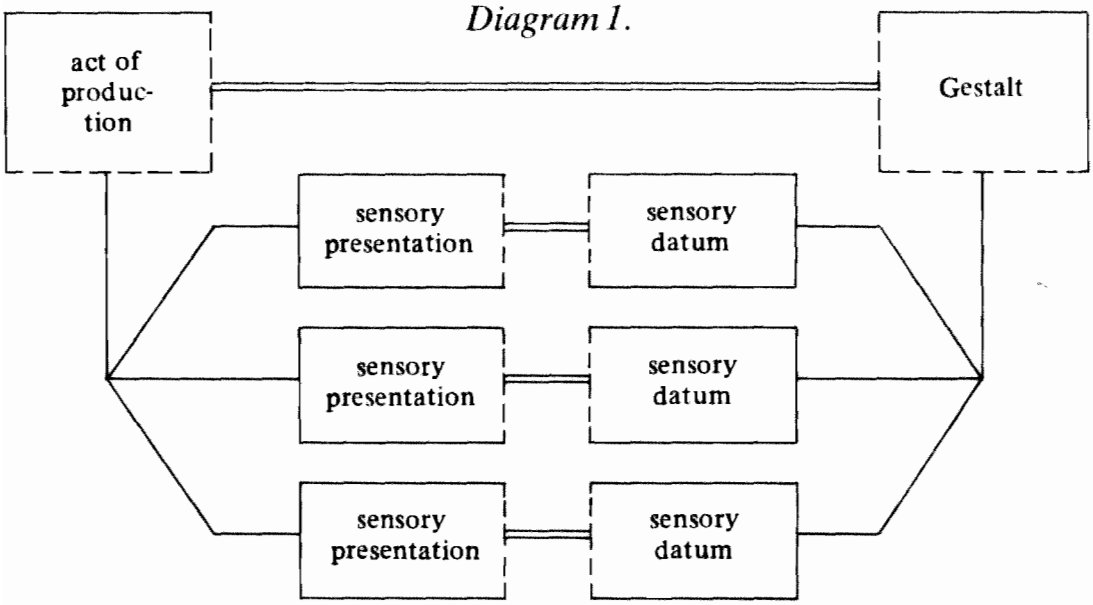
sensory experiences' to which appeal is made in Benussi's theory. Do we really, Koffka asks, have such pure sense experiences – for example when we see merely individual points in an array of colour – in such a way that the particular order or configuration of the points would not be included in the seeing? Surely not, he argues (Koffka 1915, p.24); but from this it follows that the very idea of Gestalt ambiguity, the idea that there can be a multiplicity of Gestalten on the basis of constant sensory data, must also be rejected. For what could be the evidence that sensory data is constant, given that the sensory material is present only within the Gestalt? What could be the evidence of constant material of sensation when the supervenient Gestalt is itself allowed to change? Koffka concludes that it is a mere assumption of constancy – of the constancy hypothesis – on Benussi's part which justifies the given claim. (*Op.cit.*, pp.25ff.) Only if the process of Gestalt formation were suppressed could one observe whether the underlying material stays constant – but then no Gestalt would have been formed.

Koffka argues further that ambiguity cannot be a criterion of Gestalt perception, as Benussi had argued. For even sensory data, e.g. a redness, can be more or less dark or light, more or less warm or cold, more or less penetrating, more or less tinged with yellow or tinged with blue, and so on, in the sense that the same observer might see it under the same external conditions now in this way, now in that. (*Op.cit.*, p.29) These are of course fine differences compared to the differences involved in Gestalt perception, but this shows only that – as Benussi himself was later to accept – the distinction between univocity and ambiguity is a gradual one. It does not mark any categorial difference between different species of experiential object.

Most important from our present point of view, however, is Koffka's analysis of the relation between stimulus and observer. Benussi, and indeed the entire Ehrenfels-Meinong tradition, had seen stimuli as something objective, an external given of psychological theory. Koffka, however, insists that the characteristic of a real object or physical process which consists in its being a stimulus is not any absolute property of the object or process as it is in itself, but rests always on its relation to the subject or sentient organism. More precisely, it rests on a specific state of readiness or *mental set* on the latter's part.[35] But now, if a real object is a stimulus only in relation to an organism and some specific mental set, then it will turn out that it can serve either as sensory stimulus or as Gestalt stimulus from case to case.

7.2 Benussi's own view of these matters may be represented, somewhat crudely, as follows:[36]

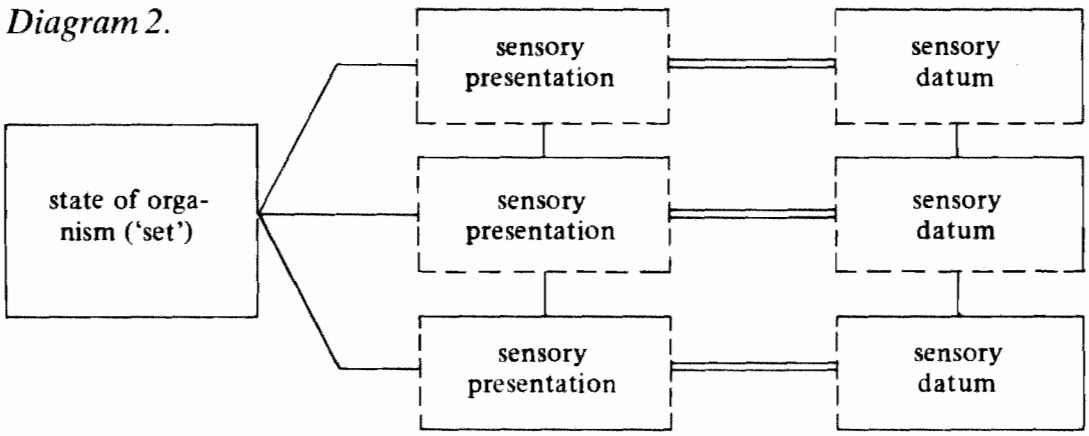
Diagram 1.



This diagram ignores both the underlying objects or objective conditions and also the subject or organism upon which acts of production and presentation are in every case dependent; yet it still contains much of what we need to know about the core of Benussi's theory. Thus it tells us that the act of production and the experienced Gestalt stand in a relation of mutual dependence: neither can exist without the other. The act of production is unilaterally dependent on the sensory presentations which underlie it, as the Gestalt is itself unilaterally present on the sensory data which these presentations are presentations of, presentations and data themselves being such as to stand to each other in a relation of two-sided dependence: neither can exist without the other.

In Koffka, on the other hand, we have a picture which (in a highly simplified form) might be represented as follows:

Diagram 2.



Here there is no additional entity alongside the sensory data, to which appeal would be made in order to account for the fact that the relevant sensory presentations contribute to the experience of a structured phenomenon. For Koffka holds that the manifold of sensory data themselves, as these are reticulated together in a certain way in the given context, is itself the Gestalt. Moreover, the reticulation of these data reflects – and is a consequence of – an (isomorphic?) interdependence among the corresponding sensory presentations. In place of Benussi's extra brain level – the process of production – the Gestalt experience is here constituted by a short-circuiting, a mutual integration, on the primary level of sensory experience (here represented somewhat crudely in terms of a cumulative dependence of successive presentations), with a parallel integration on the side of the successively given data.

The interdependence of the successive presentations is, like these presentations themselves, dependent on the state of the organism in question. For the precise nature of the physiological integration that occurs in any given case will be dependent on the relevant mental set. This is itself not a bloodless abstractum but a complex of physiologically grounded states exhibiting dimensions of variation of its own. Such states will, we might suppose, reflect materially determinate knowledge and habits of mind acquired by the organism in question, which may be further dependent on social factors, institutions, authorities, language, and so on.

Of course, when dealing with the Wertheimer-Koffka position we should not speak at all of 'sensory presentations' or 'sensory data' but always rather of activity at the cortical and peripheral ends of sensory nerves. Moreover, when dealing with this position we have always to remember that there is built into the theory the possibility that all the constituent frames should become rolled into one. For the various mutually dependent factors are only abstractly distinguishable, so that we ought more properly to speak of one single physiological-perceptual total process. Certainly this process manifests contours and dividing lines within itself; but it may still be abstractly delineated into part-processes in a number of different ways. Thus we might take the state of the organism together with the organism itself as constituting one single whole, intervening between perceived data and acts of perception. One could then interpret Koffka's view as one according to which the organism is a mediator between perceptual process – an inextricable fusion of sensory and intellectual part-processes – and perceived Gestalt, in such a way that

perception, organism, and percept would each be *gestaltet* in different but mutually complementary ways.

But what, now, is the perceived Gestalt on a theory such as this? It is, first of all, an integral whole which includes among its parts the putative sensory data experienced 'integrally' together. But this perceived Gestalt can be conceived also as including certain parts, surfaces or moments of the relevant *object*. Hence the latter need not be confined to the status of an optional extra beyond the domain of what can be experienced, as on the Brentano-Meinong-Benussi approach. Koffka, like Wertheimer, is indeed quite clear that perception is of real objects in the material world. The Gestalt concept belongs not to the abstract level of idealities, as on the Graz theory, but is rather a concept which, like causality, is basic to the sciences of the real:

> To apply the category of cause and effect means to find out which parts of nature stand in this relation. Similarly, to apply the gestalt category means to find out which parts of nature belong as parts to functional wholes, to discover their position in these wholes, their degree of relative independence, and the articulation of larger wholes into sub-wholes. (1935, p.22)[37]

There are, then, Gestalten *in reality*. It had been an implication of the Graz view of produced Gestalten that everything that is complex in reality, insofar as it is non-produced (not a matter of 'objects of higher order') would be a matter of mere summative wholes or '*Und-Verbindungen*'. Koffka rejects this view resoundingly. (1915, p.35) He himself is still primarily interested in Gestalt processes and structures in the physiological domain; indeed he argues that intellectual acts of production would themselves have to be processes of this sort. But then later he will recognize that there are Gestalt processes also in the realm of human action, above all in motor actions, speaking, writing, singing, sketching. These are not step-wise sums of behavioural elements, but unified Gestalt processes whose structures can be adequately understood only as such. (*Op.cit.*, p.37.)[38]

The thesis that there are real Gestalten was later refined and generalized in Köhler's work on physical Gestalten of 1920, which defends in great detail the view that there are Gestalten even in the world of inanimate nature.

In summary we can say that the content of a perceptual presentation, for Koffka, is a function of various factors, including both objective

(stimulus-like) and subjective (set- or *Einstellung*-like) factors. And 'ambiguity' for Koffka, signifies merely: dependence on many rather than on a few such factors.

7.3 It has sometimes been assumed that Koffka simply got the better of Benussi, and that his review constituted the nail in the coffin of the Graz theory. This is first of all to belie the continuing influence of Grazist ideas, as for example in the work of Heider, Michotte, Bühler and others, as well as in the work of the Italian psychologists. Secondly however there are a number of ways in which Benussi might reply to Koffka's challenge. Thus for example Koffka criticizes Benussi's theory by arguing that the idea of acts of production is a spurious one: it is not open to us simply to subtract what is yielded by the senses from what is yielded in total Gestalt perception and then baptize the not introspectively available remainder as a special, non-sensory act. Yet Benussi can point out that the acts to which he himself appeals are at least no more mystical than the hidden states of Koffka's theory. Benussi himself, it is true, cannot *exhibit* an act of production, since he is concerned to stress that there is no phenomenological difference between Gestalt presentations and sensory presentations (1914a, p.403): production is in effect a purely functional notion. This is not the only possible approach however. Thus acts of production involve, for example, collection, articulation, completion, comparison, and phenomena of this kind have been investigated in detail by Husserl, especially in his 6th Logical Investigation which deals with higher order intellectual operations of various sorts.

Further, as we have already seen in our discussion of Kanizsa above, the opposition between perceptual and intellectual operations which lies at the heart of Benussi's theory can still yield interesting and fruitful empirical results, and we should be no more willing to accept that running together of these two types of operation (in favour of perception) which is favoured by the Berlin theory in some of its guises, than to accept the opposite running together – the assimilation of perception to cognition – which is favoured by Helmholtz and also by modern-day proponents of a computational 'cognitive science'.

§8. From Prague to Berlin: Stumpf and Wertheimer

8.1 Wertheimer, Köhler, Koffka and Lewin, the four principal members of the Berlin school, all studied with Stumpf in Berlin, and all but Wertheimer received their doctorates for experimental work done under his direction. It has sometimes been suggested that Stumpf left his doctoral students very much to their own devices and that he therefore had a very minor part in the development of the Berlin Gestalt theory. As Ash makes clear however, Stumpf did not merely play an important institutional role in fostering the careers of his various Gestaltist students (thereby exerting a not always discrete influence on the nature and content of their work); he also provided a thorough initiation into psychological methods and a hard training, which were meted out to his students always with an explicit *philosophical* intent. When his "Psychological Seminar" was incorrectly described by the Ministry in Berlin as a "Seminar for Experimental Psychology", Stumpf complained that

> he had specifically suggested the former name... 'to avoid giving the impression that *only* experimental work is planned, when I am also planning to link such work to theoretical exercises in philosophy'. [Stumpf's] lectures were entitled 'simply psychology' and not 'experimental psychology' for the same reason. The narrower designation, Stumpf feared, could keep talented students away and 'instead attract a certain sort of American, whose whole aim is to become Dr. phil. in the shortest possible time with the most mechanical work possible'. (Ash 1982, p.47)

Stumpf's attitude to experiment had been derived from his teacher Brentano and especially from the latter's insistence on the secondary status of genetic psychology in relation to the fundamental discipline of descriptive psychology. Stumpf however went much further than Brentano in the direction of Gestalt-theoretical ideas. Thus already in 1873 Stumpf had been ready to conceive individual mental acts as mere abstractions from total conscious processes, and he had from the very beginning laid great emphasis on the phenomena of fusion (insisting, for example, that simultaneous tone sensations are never mere sums, but always wholes manifesting only gradual phenomenal differences). Further, he saw the fusion that exists in the aural sphere not as the result of any deliberate act of unifying together but rather as an immanent structural relation in the tones themselves.

All of these aspects of his work cannot but have been conducive to the

development of a theoretical integrationism on the part of his students. Stumpf did not, however, greet all the integrationist excesses of his students with equal enthusiasm. He insisted that his Gestaltist students tended to ignore the discursive, cognitive aspects of Gestalt perception and to concentrate too much on those cases where Gestalt perception occurs spontaneously and 'in one glance'. (1939/40, p.237) Further, he objected to the Gestaltist idea that Gestalten can have effects on their parts (an idea which had been adopted by the Gestaltists as a consequence of their principle that 'only that is real which has effects'). It is a mistake in ontology to suppose that the whole can exert a causal influence upon its parts, Stumpf insisted, and the parts, can just as little have an effect on the whole: it is always only parts which have an effect on parts. (*Op.cit.*, pp.245f.)

8.2 The early development of the thinking of Köhler and Koffka has been dealt with in detail by Ash, and can therefore be passed over here. We must, however, say something about the early background of Wertheimer. This is first of all because it is he who, of all the members of the Berlin school, had the most philosophically interesting ideas. But it is also because, as already mentioned, Wertheimer constitutes an important link between Austrian philosophy and German psychology, having grown up in Prague, where he attended the lectures of Ehrenfels and also of the Brentanians Marty and Arleth. There were of course other influences on Wertheimer's early thinking, and some of these may have played a role in his development of the Gestalt idea. Prague, as is well known, has a distinguished tradition of Jewish scholarship and there is a suggestion that Wertheimer himself is descended from a line of Talmudists, including among them the Talmudic scholar Rabbi Samson R. Wertheimer (1651-1724), who was Court Factor in the Austrian Imperial court.[39] Part and parcel of Wertheimer's non-orthodox Jewish background in Prague was his youthful enthusiasm for Spinoza and as Luchins has suggested,

> some of the ideas in Spinoza's *Ethics* seem to be reflected in Wertheimer's writing and teaching about non-additive wholes as well as in Wertheimer's objections to psychological theories in which will and feeling were opposed to thinking, and in which the mind was a separate entity and was opposed to the body (unpublished n.10 to Luchins 1982; see also (and perhaps more reliably) Ash 1982, p.247).

This unity of mind and body in Wertheimer's thinking is well illustrated

by the following passage from Fritz Heider's autobiography, in which Heider comments on a seminar of Wertheimer's dealing with physiognomic characters, and with expression, another notion central to Spinoza: 'each person has a certain quality that Wertheimer called his *radix*... This quality will express itself in different ways: in his physiognomy, in his handwriting; in the way he dresses, moves about, talks, and acts; and also in the way he thinks' (1984, p.46f.).

Especially interesting is Wertheimer's 'physiognomic game...: he would play a melody, and the rest of us would try to guess which of the group his melody portrayed'. (*Op.cit.*, p.89.) For in extemporizing the music which would represent the character ('radix') of a particular person, Wertheimer would take into account not merely the physiognomy of the person in question, but also the contrastive relations in which he stood to other persons in the room. The musical representation of some averagely quiet and withdrawn character which would enable one to pick him out in, say, a room full of extroverts, will be quite different from that representation which would be needed were he surrounded by people still more withdrawn than himself.

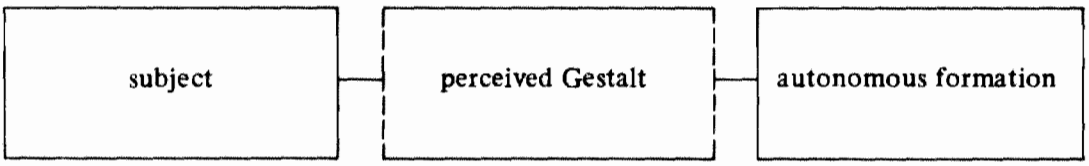
The German University in Prague could look back on a rich psychological tradition, beginning with the phenomenological work on colour vision of Purkinje and Hering and extending through Stumpf himself (who was professor in Prague from 1879 to 1884, before moving to Halle where he came into contact with Husserl).[40] Mach also belonged to this tradition, having been professor of experimental physics in Prague for 27 years to 1895. It included Ehrenfels and the orthodox Brentanians Marty, Arleth and Oskar Kraus, together also with Kafka's friends Hugo Bergmann and Emil Utitz.[41] And Einstein, too, held a chair in Prague for a time, becoming friendly with Hugo Bergmann[42] and later with Wertheimer himself, their interactions being manifested above all in Wertheimer's book *Productive Thinking*.

Wertheimer was caught up to a greater or lesser extent in all of these currents. There is evidence in his papers that he became interested also in the writings of Husserl, particularly of the latter's 3rd Logical Investigation on the theory of part, whole and dependence,[43] and he maintained throughout his life a characteristically Husserlian interest in the realist foundations of logic and in the relations between logical laws and the flux of actual mental events involved in thinking.[44]

§9. The Veridicality of Perception

The objects we perceive exhibit structures and properties that are not indigenous to the world as it is in itself. As we have seen, the Gestalten given in perception may be characterized by both *inadequacy* and *incompleteness*. Consider, for example, the two horizontal lines of the Müller-Lyer illusion. These are objectively of equal length, but they are experienced as being such that one is shorter than the other, so that there is a discrepancy between the structure we experience, the perceived Gestalt, and the underlying autonomous objectual formation. We can say that, ignoring differences of mental set and of environmental conditions, the perceived Gestalt is dependent both upon the experiencing subject on the one hand and upon the autonomous formation on the other, a state of affairs we might represent as follows:

Diagram 3.



Clearly there is a danger, in such an account, that we shall end up with some form of Kantianism, with a view according to which the underlying autonomous formation would cease to play a role as an object of cognition but would rather dissolve away into an unknowable thing in itself.[45] Such a view, which confines the perceiving subject to a windowless prison where he can grasp at most 'intentional' or 'notional' objects, was indeed held by some members of the Gestaltist tradition. We have already however encountered another view, present in one form or another for example in Gibson, as already in Wertheimer and in Koffka (by whom Gibson was influenced), according to which Gestalten are to different degrees *transparent*: they do not block out all autonomous properties of the objectual structures on which they depend, but rather overlap materially with these objects (or indeed in some cases include them as parts). Hence to be involved with the perceived Gestalt is thereby also, willy nilly, to be involved with parts or moments of the underlying object. Indeed, the very fact that perceptual illusions affect only a certain limited set of features of the phenomenal world suggests that most experienced Gestalten are to a high degree transparent in this sense.

Moreover, even in cases of non-transparency we can embed an objectual formation into a larger whole – for example we can embed the two figures of the Müller-Lyer illusion into a complex involving movements of the hand and the laying on of rulers – in such a way as to make initially opaque properties of the original formation directly and transparently accessible as parts or moments of the resulting total Gestalt.[46] Indeed one could say that the process of measurement, which enables us directly to determine a large range of properties of objectual formations, is in fact nothing other than the embedding of an object within a larger structure in such a way as to increase the degree of transparency of perceptual Gestalten of specific sorts.

Not only measurement, however, but also perception in general involves Gestalten which are transparent in this sense. This implies that the world that is given in perception, that complex of perceived Gestalten which is associated with each individual conscious life, does not merely stand to the physical world in a network of functional dependence relations (of the sort which exist in those special circumstances which are simulated in the various classical perceptual illusions), but is in fact to a large extent coincident or co-continuous with the world as it is in itself.

There is of course another, parallel relation, no less crucial to the Berlin theory, the relation between psychological phenomena and the brain events which underlie them. Köhler, in particular, has contributed to our understanding of this relation, advancing a thesis to the effect that both psychological events and the associated physiology have structures and that there is an isomorphism between these structures. This thesis is interesting and challenging in its own right. Here, however, it is the externally directed structural relation that I should like to discuss, i.e. that relation between the geographical and the phenomenal world which is involved in veridical perception. It is above all Wertheimer who has developed this notion and who has been most sensitive to the implication that we should investigate the conditions of the field and of the perceiver that produce correspondence or non-correspondence between perceptions and segments of the world.

Köhler's hypothesis of interior isomorphism leads not to investigations of this sort, but rather to work on the identification of the structural processes in the brain that are relevant to perceptual experience.[47] Outside the specific context of his work on isomorphism, however, Köhler too manifests all the sympathies of the realist. Thus consider the following passage in which Köhler critices Kant on the grounds that:

If... certain formal principles are found to be prerequisites of science it does not follow that they belong to the structure of the mind. There remains the other possibility that, to some degree at least, they are inherent in the 'material'. The validity of Kant's theory depends altogether upon his assumption that, in the 'material', there is no basic principle of order. (1938, p.43)

Köhler's realist sympathies reveal themselves also in his treatment of the perception of causality in the *Psychologische Probleme* of 1933. Thus when I drink a glass of beer I experience both a characteristic taste and a characteristic feeling of enjoyment. 'Must I first of all learn that the enjoyment has something to do with the taste? That it has nothing to do with the spider on the wall?' Clearly not. I experience the enjoyment as the natural, appropriate and immediate result of the taste. Similarly, I do not need to learn that this or that action or attitude (say anger) is the natural and appropriate response to a situation of this or that kind. And now, as Köhler writes, his considerations of such relations

move close to the ideas of the 'act psychology' of Brentano, Stumpf, Husserl, and others, without however it being the case that that moment with which we are presently concerned is drawn attention to by the proponents of this psychology. It belongs to an 'act' that it has an object. This has often been repeated, but thereby it was not at all the case that there was addressed the problem of the organization of the total field. Thus there remained at least unformulated the idea that the immediate givenness of such a connection – of precisely *this* specific act with *this* object there, in *this* manner – excludes from the start an atomistic treatment of the field whole and signifies in every case quite specific articulation of the total field. The explanation for this certainly lies in the fact that one was aiming for the sharpest possible *conceptual* separation of all acts from all objectual material (that is to say for a classification). (1933a, p.228f.)

Gibson moved on from ideas such as this, ideas which see intentionality and truth as being themselves Gestalt relations of certain sorts, to a position which allows also the bodily behaviour of the subject to count as an irreducible factor in the structure of perception. Standing in that Gestalt relation to an object which is veridical perception is now quite explicitly a dynamic matter, a matter of our maintaining ourselves in that ecological niche which allows us to join up with the object in real relational contact.[48]

§10. Edwin Rausch: The Ontological Morphology of Gestalten

Das Lied von den Ganzen und den Teilen

Das Ganze und die Teile
Die hatten grossen Streit,
Wer wohl das Früh're wäre
In Logik, nicht in Zeit.

Es sprachen keck die Teile:
"Wir setzen dich zusamm
Und nirgends gibt es Ganze,
Die keine Teile hamm."

Voll Pathos rief das Ganze:
"Pfui, dass, ihr noch nicht wisst,
Dass jeder von Euch Teilen
Kraft meiner Ganzheit ist."

Ein Logiker der hört es
Und sprach: "Der Streit ist schief,
Denn keines ist das Früh're,
Ihr seid korrelativ."
(From *Ausgewählte Miseskreislieder*,
by Felix Kaufmann.)

10.1 Gestalt psychology may or may not be capable of *explaining* our perception of what is complex. There remains, however, the independent task of *describing* the structures involved in such perception and the various relations of ontological, genetic and functional dependence bound up therewith, and many of the experimental results and theoretical contributions of the Gestalt psychologists can be seen as fundamentally important contributions to the carrying out of this descriptive task. This was recognized already by Stumpf, but the most sophisticated contributions to the enterprise of reconstituting Gestalt theory as a descriptive science have been made by the German psychologist Edwin Rausch, foremost surviving member of the Berlin school, in a remarkable series of essays begun in 1937.[49] Here I shall concentrate principally on the implications of Rausch's paper on "The Problem of Properties in the Gestalt Theory of Perception" published in German in 1966, a paper whose particular interest here turns on the fact that it seeks a compromise between the Graz and Berlin theories

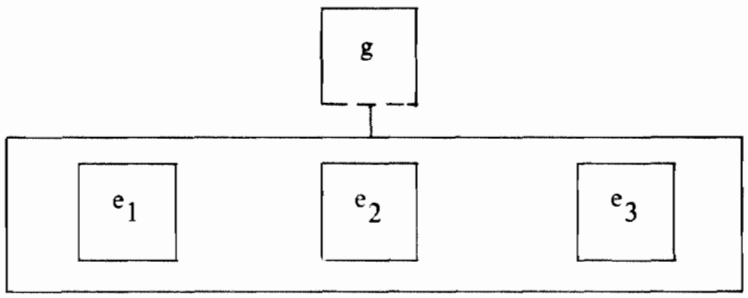
precisely on the basis of a reconsideration of the ideas in Ehrenfels' essay of 1890.[50]

Ehrenfels, as we have seen, wanted to understand 'Gestalt' in terms of a special kind of *attribute* of certain phenomenal wholes or complexes. Rausch, in contrast, takes 'complex' as a determinable concept with 'Gestalt' as one of its determinates: a Gestalt is, as always on the Berlin theory, *a special kind of whole*. Ehrenfels' ideas are not simply abandoned hereby however. For a complex, in order to be a Gestalt, must have certain special characteristics;[51] that is, it must possess precisely certain 'Gestalt qualities' – which now, however, are not supernumerary entities, as on the Ehrenfels view, existing alongside or above the separable *fundamenta*. Gestalt qualities are, rather, conceived by Rausch as being in a certain sense intrinsic to the Gestalt which has them. Moreover, Gestalt qualities are merely one special type of whole- or complex-quality. Other complex-qualities might be, for example, the quality of being a one-dimensional continuum, the quality of being a purely summative whole, or – in the manner of Stumpf – some other formally or materially specific quality between these two extremes.[52] We shall indeed talk not of complex-qualities but rather of (non-distributive) properties of wholes in general (of properties which are such that they hold only of wholes *as wholes*: they do not distribute to the several parts, as does, say, the property of being extended, or of being made of inorganic material).[53]

Armed with this general view of Gestalt qualities as special kinds of whole-properties and of Gestalten as special kinds of wholes, we can now begin to see that Ehrenfels' own original theory already contains within itself the material for this generalization along Rauschian lines. For consider a simple Gestalt structure consisting of, say, three elements e_1, e_2, e_3 and some quality g. This we can represent as follows:

Diagram 4.

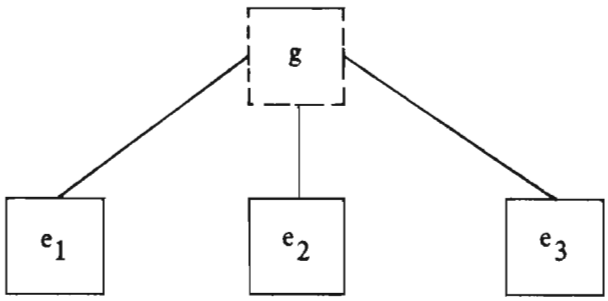
[A]



But we can also, as Ehrenfels (and Stumpf and Husserl) acknowledged, conceive the property g as a three-term relation ('unifying moment') holding *between* the given elements, somewhat as follows:

Diagram 5.

[B]



with correspondingly more complex transformations where we have to deal with higher order Gestalt structures, with structures involving phenomenal fusion or continuity, and so on.[54]

This possibility of transition from property to relation and back again shows itself not only when we go from parts (and the relations between them) to wholes (and their properties), but also when we remain with the parts. Under certain circumstances – namely when some one given part overwhelms its relata – we can describe a relation between parts as a property of some one given member. Suppose, for example, that light is reflected by the surface of an object A in the direction of an observer B. We may in certain circumstances choose to describe this relation simply as a property – of shininess – in A. Similarly in cases where some given agent is described as being 'powerful' or 'threatening', when he is in fact powerful or threatening only *in relation to* one or other group of his fellows.

The total field of ego plus environment, too, can be conceived either as a relation or as a property, and then either of the ego or of the environment, and the same considerations can be carried over also to the relation of figure and ground on the side of the object, which can be described either in the form of a relation (of the figure to the ground) or of a property of either. Considerations such as this, when carried over to the material sphere, will allow us to generate a taxonomy of whole-properties, distinguishing, for example, between

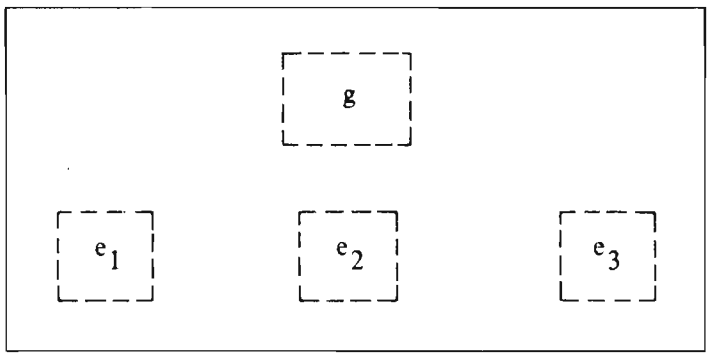
- *structure-properties* (properties of order and construction) such as *symmetrical*, *rising*, *falling*, *closed*,
- *texture-properties* such as *soft*, *rough*, *matt*, *transparent*,
- *expression-properties*, properties of character and feeling such as *proud*, *peaceful*, *domineering*, *threatening*, and so on.[55]

Ehrenfels saw Gestalt qualities as constituting a fixed class of all those entities satisfying given criteria. From our present point of view, however, whether a complex is or is not a Gestalt is a *gradual* matter. Thus a sequence of tones constitutes a Gestalt to the extent that a melody can be heard in it, and different tone-sequences may have melody qualities to differing degrees.[56]

Return, however, to our figures [A] and [B] above. We can now cut the pie again, and conceive quality and elements as together constituting a single whole, complex or Gestalt, whose parts are (again to different degrees from cases to case) only potentially discriminable within it:

Diagram 6.

[C]



It is this possibility, of moving from elements plus property to a single all-embracing whole, which explains why there are cases – as, again, the melody – where we use the same term for both Gestalt wholes and their qualities.[57] The phenomenon of transposability, too, justifies our conceiving the melody and the concrete tone-sequence as more or less equivalent, since we can for most purposes ignore what is peculiar about the particular individual tone-sequence in which a given melody is realized.[58]

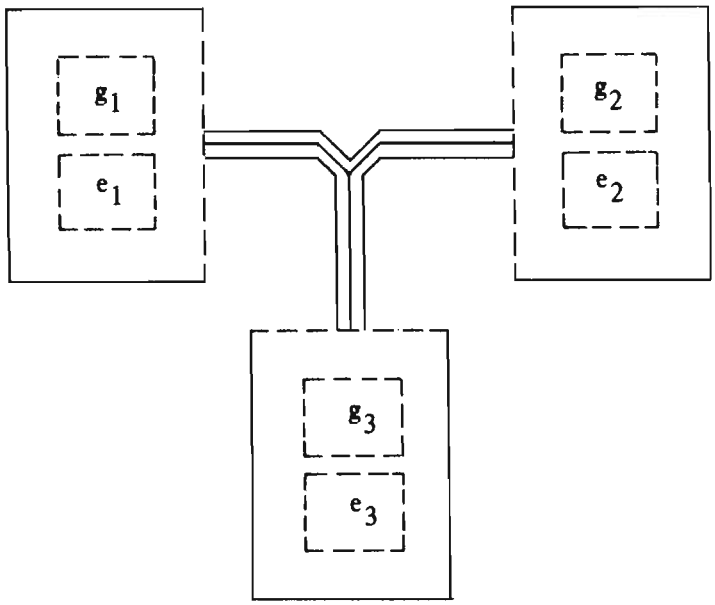
Whether we view the whole as a complex of elements with its quality ([A]), or as elements bound together by a unifying relational moment ([B]), or as a whole within which elements and qualities/relations are

distinguishable only abstractly ([C]), is in the end a matter of convenience. Some sorts of examples will call for one description, some for another, in the light of given contexts and purposes.[59]

Things do not stop here however. Even in relation to the relatively simple structure so far treated, there is yet another parsing which results when we abstractly imagine the whole [C] as having been once more prised apart, in such a way as to yield three new, qualitatively determined moments, somewhat as follows:

Diagram 7.

[D]



That is, just as we conceive the complex whole in [A] as possessing a certain characteristic whole-property, so we can conceive the different parts of this complex as possessing their own characteristic *part-properties* in virtue of which they come to make up that total whole which is the original Gestalt.

Ehrenfels and the Meinongians did not recognize such part-properties (properties holding of given elements in virtue of their serving as foundation for a Gestalt). The crucial ontological step was taken by Wertheimer in his discussions of phenomenal 'roles' or 'functions' which can be predicated exclusively of parts *qua* parts just as whole-properties can be predicated exclusively of wholes *qua* wholes.[60]

10.2 Part-properties may on the one hand be entirely trivial. If I see * * * then there are for example part-properties of being *extremal*, or of being *in the middle*. Even here, however, a certain complexity can prevail in relation to that larger Gestalt which consists of the three asterisks bound up with me myself as perceiving subject. Within this Gestalt, the extremal asterisks have the dependent relational properties of being *to the left* and *to the right*, of being *objects of my present attention*, and so on. Thus even a purely summative whole, to the extent that it is treated by the perceiver (or by a group of perceivers) as a unitary object, is to that extent *gestaltet* when considered in conjunction with the relevant acts and states of the subjects in question.

The three asterisks, as members of this larger Gestalt, like the three members of [D], are mutually dependent. For even should it be the case that the respective elements are in some sense capable of existing raw, in separation from each other, still, the qualitatively determined Gestalt members are necessarily such that they can exist only in association with each other (consider a tone given in isolation and within the context of a melody). Thus where, according to Ehrenfels, the only dependent properties – i.e. the only properties which can gain existence through unification and lose existence through isolation of their carriers – are whole-properties, we can now see that part-properties, too, are existentially sensitive in just this sense.

But they are existentially sensitive to different degrees. For part-properties include not only the properties of dependent, integrated parts (the character of 'across' in Wertheimer's phi-phenomenon, for example); they include also properties characteristic of *natural* parts, of parts which manifest a (relative) insensitivity to isolation. One can indeed imagine a morphological theory – analogous to Thom's theory of catastrophes – which would classify part-properties according to their stability and instability when the corresponding wholes are subjected to certain kinds of change.[61]

A whole made up of natural parts is a weak Gestalt.[62] The weak coherence *between* parts is balanced by strong coherence *within* parts (and clearly we have to deal here with a complex spectrum of cases). One particularly interesting variety of weak Gestalten are *dependent* Gestalten, that is to say, Gestalten which depend for their existence on our subjective articulations.[63] As Koffka puts it:

We find the field organization under certain circumstances dependent upon attitudes, i.e., forces which have their origin not in the surrounding field at all, but in the Ego of the observer, a new indication that our task of investigating the surrounding field alone is somewhat artificial, and that we shall understand its organization completely only when we study the total field which includes the Ego within its environment. (Koffka 1935, p.149)

Weak dependent Gestalten are most prominent, perhaps, in the sphere of social wholes. Here, however, the job of articulation and integration is carried out not by some external observer but from within, by the members themselves, i.e. by those natural parts of the relevant social whole who are human beings. Such articulation from within will be effected to different degrees by different persons, reflecting the relative predominance of the groups to which they belong within the whole in question. All government and law presupposes Gestalt articulation in this sense, which manifests itself for example in feelings of respect or loyalty on the part of the constituent subjects: they see these and these actions as legitimate *actions of state* and not for example as the posturings of usurpers. Clearly here, too, there is a spectrum between weak and strong Gestalten, reflecting the extent to which the relevant articulating and integrating habits are well-entrenched among the people or merely imposed upon them from above.

10.3 We must return, however, to our more homely, perceptual examples. Clearly each sequence of notes that is a melody possesses a certain whole-property, each single note (and segment) possesses its own part-property (role, function), the latter being of course not restricted to those cases for which we have names (tonic, dominant, leading note, cadence, trill, etc.) (p.892f.). More important still, however, is the fact that – as Ehrenfels comes near to recognizing – the discipline of linguistics deals precisely with whole- and part-properties in this sense: properties such as *sentence*, *intonation pattern*, *subject*, *verb*, *object*, *phoneme*, *fricative*, and so on, and with the relations between them.[64]

From Ehrenfels' point of view, a Gestalt quality (whole-property) disappears when we isolate its parts. A thesis of this sort can be formulated also for part-properties, and we can see that it holds (to a degree) only for certain quite specific kinds of 'natural' part (for example of stones in a heap). In no cases however does isolation of parts lead to a mere loss of properties: neither whole-properties nor part-properties are simply added extras which spring into existence at the moment of

unification and disappear on isolation. Isolated parts *qua* isolated have peculiar characteristic features of their own, 'isolation-properties' [*Einzelgegenstandseigenschaften*], which depend on the one hand upon the peculiar features of their new environment and on the other hand upon what they bring with them from their environment of old.[65]

Thus a part that has suffered isolation may manifest itself as being
(i) independent and self-contained (this applies only in the case of natural parts),
(ii) incomplete or 'unsaturated', in need of supplementation,
(iii) 'lost', homeless, astray [*Verloren*],
(iv) alien, unbefitting [*Fremd*].
Suppose, for example, that we isolate a group of tones that had previously been a part of a melody. The tones are not simply poorer by the part-properties they had in the melody. They exchange these part-properties for new isolation-properties, for example the property of being given as figure, alone, against a ground of silence, of being in need of completion (for example where the group in question ends on a leading note), and so on. Or consider an isolated coloured fleck. This, too, must appear in some specific way against a background of some sort, and then it may manifest itself either as incomplete, as 'lost' or 'homeless', or as an alien body smuggled into an environment in which it does not belong, as a disturbance in or defect of its environment. A true isolation in the phenomenal sphere, a sensory experience pure and simple, does not exist.

But what applies in the sphere of phenomena applies also to (naturally occurring) parts in general. A part does not, on being separated, exist merely *in vacuo*, but always in some context in which it contributes to new Gestalten and thereby undergoes various functional changes within itself. A Japanese glass pyramid appears in one context as a fitting, proper part of its environment; translate it to a different context, and it will stick out as an entirely alien body.

The problem of part- and whole-properties should not, however, be treated from a purely synchronic point of view. Parts which have been subject to isolation may grow into unified wholes in their own right, or they may become merged into their new environment in such a way as to lose their properties of isolation. Wholes may come to manifest a high degree of inter-partial unity because their parts have grown together, for example as a result of sharing historically a common fate. And such diachronic factors may manifest themselves also on the subjective side:

the experiencing subject learns to accept the belonging together of parts which had previously seemed to be merely separate. Indeed this subject may himself be changed by the material he experiences, so that he begins to see a whole because he himself has become caught up in its web.

This may suggest the idea of a refined production theory which would operate not at the level of the single act but at the level of whole sequences and traditions of acts and actions spread out in time. The fact that one may not grasp the structure of a complex directly, but that it may take time and effort, would not however support the Graz thesis of productive activity at the expense of the Berlin theory. For the fact that Gestalt phenomena arise as a result of a process is precisely emphasized by the Berlin Gestaltists – they insist only that this process does not go to work on fundamenta which remain invariant: the whole process – taken together with its initial material and with its result – is itself *gestaltet*.[66]

§11. Reference Systems and Paradigm Change

11.1 There are two quite different sorts of part-property which may be possessed by a musical tone. On the one hand are properties which the tone has in virtue of its specific role or function in a given melody or sequence of chords. On the other hand there are relatively intrinsic or systemic properties which the tone has for example as the dominant or sub-dominant of a given key. (p.895ff.) From this we can see that Wertheimer's 'roles' or 'functions' may be determined in two entirely different sorts of ways. On the one hand they may be determined by a given context, aim or purpose; on the other hand they may be determined by the fact that they constitute, in combination with other, complementary roles or functions, systems of interdependent referencepoints.[67] We might think of such systems as networks of *virtual* Gestalten, which give meaning to those Gestalten within them which come to be realized, but need not themselves be given intuitively at all. Thus *peak*, *foot*, *flank*, *standing*, *lying*, *below*, *above*, *left*, *right*, *in*, *on* all appear as mutually correlated terms within the various reference systems of *spatial order* – and clearly here, too, we can distinguish both objectively and subjectively determined reference systems (and of course combinations of the two). The movements of the earth on its axis and in relation to the sun serve to determine an objective reference system of temporal order, in

greater or lesser conformity with which are the various way-markers laid down subjectively e.g. in our secular and religious calendars, in our histories and personal biographies. Language, gesture, the system of values that is market price, geographical, social, legal and political divisions, all constitute reference systems against the background of which specific Gestalten of a more or less ephemeral nature (sentential utterances, market transactions, treaties in international law) can come to realization. But also the various concepts with which we find our way about the world are tied together in reference systems of the given sort (in this case normally hierarchically organized). Human learning and development consists to no small extent in the interiorization of reference systems of this sort, which are themselves interrelated in a multitude of ways. Thus it is a system of social customs and habits which fixes a certain unity of sound, delimits it as part of a system of linguistic sounds, joining it as carrier of meaning on the one hand to the system of behaviour in the given society and on the other hand, via its combination with other, complementary sound-units, to specifically delineated objects. Thus it is only when a given phonic Gestalt is thrown up against the background of a society exhibiting the relevant linguistic order that it constitutes a *linguistic utterance*. And it is only against the background of a society exhibiting the relevant legal order that specific utterances ('I pronounce thee man and wife') represent elements of a legal process.

A melody is a property of a tonal sequence determined also, if Koffka is right, by a certain mental set on the part of the hearer. The latter hears different melodies if he is set in different ways. We can now see that mental set, too, is determined by reference systems of the given sort. The system relevant to the set of one hearer may involve the opposition major vs. minor. For a different hearer, however, one used to atonal music, the very *set* of tonality may be decisive, so that the major-minor opposition plays no role. For more refined hearers, on the other hand, the specific key or the specific instrument may be decisive. From this however it follows that there is an analogue of Gestalt ambiguity – of the switch from one Gestalt to another – which applies at levels of entire reference systems.

The shift from system to system can occur in any sphere. (One can still go into the bars of Constantinople and hear drinking songs lamenting the loss of Sicily to the Italians.) But it is perhaps in the history of science that such shifts are most pronounced. For every science supplies a web of system-determined properties within the terms of which the relevant

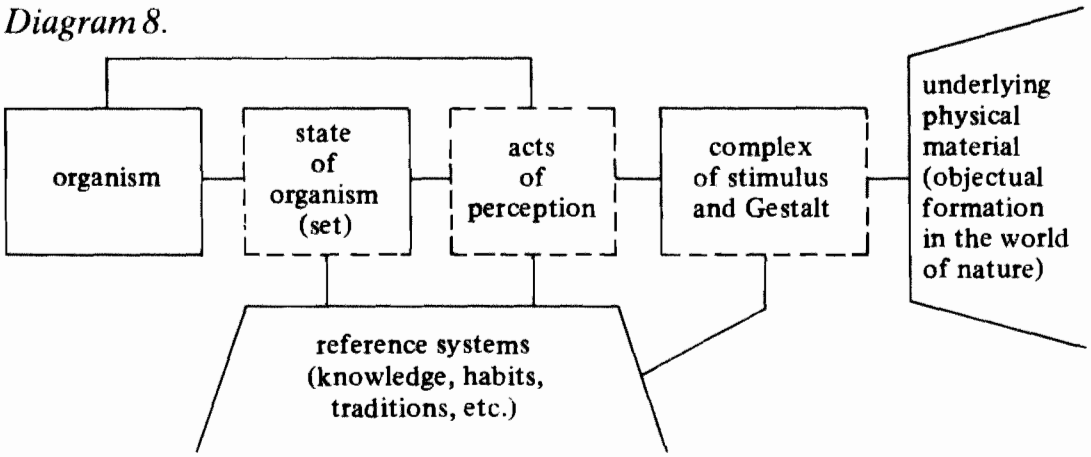
object matter is articulated, delimited and understood. When, now, one reference system within a given science comes to be abandoned in favour of another, this brings in its wake what the Gestaltist would call a 'reorganization of the entire field', what Kuhn calls a 'paradigm change', and what Wittgenstein would describe in the terminology of 'seeing as'.[68]

An early application of the idea of '*Gestaltsehen*' to the understanding of scientific change is Ludwik Fleck's work on the 'scientific fact' of (1935). Fleck refers to

> a case of mass suggestion which induced the entire crew of a ship, while searching for a boat in distress, to see this craft and its crew and even to hear shouts and see signals. This collective hallucination was suddenly dispelled but only during the last minutes of approach. The 'boat' turned out to be a tree with branches and leaves drifting in the water. This case could be considered the paradigm of many discoveries. The mood-conforming gestalt-seeing and its sudden reversal: the different gestalt-seeing. Suddenly one can no longer even understand how the previous form was possible and how features contradicting it could have gone unnoticed. The same situation obtains in scientific discovery, only translated from excitement and feverish activity into equanimity and permanence. The disciplined and even-tempered mood, persisting through many generations of a collective, produces the 'real image' in exactly the same way as the feverish mood produces a hallucination. In both cases switch of mood (switch of thought style) and switch of image proceed in parallel. (Eng. trans. pp.179f.)

11.2 What we see, in whatever sphere, depends therefore not merely on the stimulus conditions and on specific acts of perception but also upon our mental set. This in turn depends upon a network of systems of reference which are determined by our language, traditions, habits, knowledge. Thus we can extend our Koffka-esque diagram from §7.2 above, to yield a somewhat more comprehensive view of the matters involved in Gestalt perception, which might look somewhat as follows:

Diagram 8.



At the centre of this diagram are acts of perception. These can be conceived most illuminatingly as *relations*, connecting states of the organism on the one hand and experienced Gestalten on the other. The states of the organism are of course themselves dependent upon the organism in which they inhere, just as the experienced Gestalt/stimulus is dependent upon underlying formations in the physical world. The remaining component of the diagram – which might rather loosely be referred to as the totality of reference systems relevant to a given case – is of course a simplification: reference systems are as such mere possibilities, systems of virtual relations; they do not exist except in so far as they are realized in the states (knowledge, habits, skills, etc.) of particular organisms.

§12. The Varieties of Order

The subject-matter of this and the following section is the notion of 'Prägnanz', a notion first used by Wertheimer to describe the tendencies towards certain kinds of *order* which he and his fellow Gestaltists had detected in perceptual and memory phenomena.

We tend to see the structures of our environment as being more regular, more balanced, more typical, than they actually are. (Thus for example we normally discount the bilateral asymmetries in human faces.) Further, we tend to reproduce these structures in memory in a way which involves some adjustment towards a more simplified or standardized ideal.[69] As has been stressed above all by Italian Gestalt psychologists, two distinct notions are involved in claims of this sort. (See above all Kanizsa and Luccio 1984.) The notion of Prägnanz is in fact ambiguous as between (1) a tendency to regularity or lawfulness in our perceptual experience, and (2) a feature or features of the objects toward whose experience such tendencies might be said to lead. Thus it is primarily to the first of these two notions that Köhler is referring when he stresses that Prägnanz-tendencies, where they exist, are to a large extent independent of learning and experience in virtue of the fact that they are allied to quite general tendencies towards equilibrium in nature. Köhler compares them, indeed, to Mach's 'principle of economy':

Ernst Mach not only made the observation that [physical] states tend to develop in the direction of maximal regularity and simplicity; he also gave an explanation in which he derived this tendency from elementary principles in physics... When Wertheimer formulated his [Prägnanz] principle in psychology I happened to be studying the general characteristics of macroscopic physical states, and thus I could not fail to see that it is the psychological equivalent of Mach's principle in physics (Köhler 1938, p.254f).

It is however the second notion to which Metzger is referring when he writes that those whole-formations tend to be established in experience

which have the greatest possible simplicity, unity, density, closedness, durability, symmetry, balance, concentricality, which are such that their main axes conform to the greatest degree to the three coordinate axes of space, and finally have the greatest possible completeness and homogeneity amongst themselves. (1941, p.109 of 5th ed., emphases, parentheses and scare-quotes removed)

As this passage makes clear however, the term '*prägnant*', even when applied exclusively with its objectual meaning, has a number of different connotations. On the one hand it means 'clear', 'marked', 'a good example of its type'. On the other hand it has the connotation of 'fullness' (of 'pregnancy' in the English sense). Now it is clear that the world of art is, in whole or in part, constituted by objects manifesting certain kinds of unity, order, clarity, fullness, perfection, and so on. Can one, then, employ the idea of objectual Prägnanz in order to throw light on the nature and dimensions of aesthetic value?

Much of the literature on the 'Prägnanz' of objects has, unfortunately, taken too ready advantage of the fact that the notion is compounded out of the several different notions of 'order', 'clarity', 'fullness', 'typicality'. It is for this reason highly unclear and has rightly been criticized from a range of different points of view. Edwin Rausch however, in his paper on "Properties" already discussed, has performed the service of distinguishing carefully between the various quite distinct dimensions or aspects of objectual Prägnanz, between the several varieties of order given in experience, and I shall follow closely his treatment here.

Prägnanz as Lawfulness. The first such dimension is the dimension of [± lawfulness], a matter of regularity or '*Gesetzmäßigkeit*'. [+Lawfulness] can stand either for lawfulness as such (for any kind of lawfulness or conformity to rules, even lawfulness to a very small degree) or, it can stand exclusively for a high degree of lawfulness.[70] A [–lawful]

whole appears arbitrary or accidental, appears as if its parts have been thrown together at random, as if they could just as well have been put together in any one of a large number of alternate ways. [+Lawfulness] presupposes in every case some intelligible context or reference system in the wide sense determined above; it presupposes that the structure or structures in question instance some species or kind. Lawfulness may therefore be to some extent dependent on the contributions of the experiencing subject: a relatively complex pattern or structure can bring about an experience in one individual of an object which has [–lawful] character, and in another of an object which has [+lawful] character. The latter *sees the sense* (the law) in the structure in question. Of course, one and the same complex structure may exhibit [+lawfulness] at some levels and [–lawfulness] at others, even in relation to one and the same initial concept. Imagine, for example, a random conglomeration of individually lawful but unrelated shapes, or a random juxtaposition of mutually unrelated melodies.

Prägnanz as Originality. The second dimension of Prägnanz is that of [± originality] (*Eigenständigkeit*), a matter of the primacy, the autonomy, of a phenomenon (e.g. of a phenomenal quality), its capacity to serve as a prototype or master. [– Originality] signifies that something is derived, secondary, obtained from some initial structure by a systematic process of transformation. Thus a square has [+ originality]. A rectangle or a parallelogram has (in relation thereto) [–originality]. In relation to other figures, however, the rectangle or parallelogram may itself serve as origin, which shows that the presence of the feature [± originality] presupposes in every case the presence of some degree or kind of [+lawfulness], some specific concept in terms of which the relative originality of the phenomenon in question can be gauged. Hence the dimension original/derivative can come about only if [+lawfulness] already applies. This is true of all the Prägnanz-aspects to be discussed below.

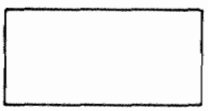
Prägnanz as Integrity. The third dimension of Prägnanz is that of [± integrity], a matter of that which is whole, complete, intact, integral as opposed to that which is disturbed, incomplete, affected at the tangent, to that which is subject to privation. Thus where [–originality] refers to a global distancing from a given figure, [–integrity] refers to a departure that is merely local. The lack of integrity can manifest itself in

different ways: something can be absent, missing, there might be a hole, there might be *too little* of something there. There can also be too much, a superfluity, a growth, an alien body. Or it can be a matter of the object's being something other than what it should properly be. Lack, damage, loss, falsification, etc., can lend to that which is complete, whole, correct, the character of being *no longer whole* or of being *not yet whole*. In both cases there is, in relation to an underlying idea of what *should* be, a manifest character of the *not yet achieved*, or of the *overstepped*. Again, as in the case of [± originality], this idea of what should be constitutes a natural reference-point for the *privatum*; here the departure involved is not one of systematic transformation but rather one of accidental disturbance (and an over-strong disturbance can lead to a destruction).

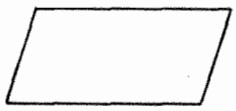
As with originality, so also here, the relation between a [+ integral] formation and the [– integral] formation which belongs to it is asymmetrical, and both again presuppose [+lawfulness]. To understand the difference between originality and integrity consider the family of parallelograms. The members of this family, taken together with their various derivatives, constitute a multi-dimensional system all of the members of which relate to the rectangle as that from which they depart. This is mirrored in language by the fact that we have one term for the original property *rectangular*, and another term, *oblique-angled*, for the infinite

Diagram 9.

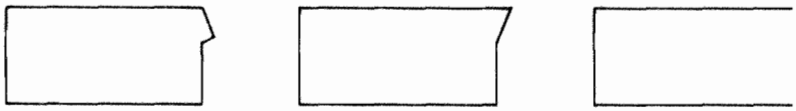
1. [+lawfulness] [+originality] [+integrity]



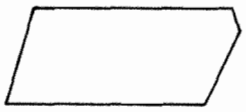
2. [+lawfulness] [-originality] [+integrity]



3. [+lawfulness] [+originality] [-integrity]



4. [+lawfulness] [-originality] [-integrity]



5. [-lawfulness]

wealth of derived cases. (Only those angles which are '*almost* right-angled' break out of this system.) Some of these dimensions are illustrated in Diagram 9.[71]

A formation such as 5. is, from the perspective dictated by the master-concept *rectangle*, lacking in all lawfulness. Hence it falls out of the system entirely. It does not even fall under a transformed law or concept such as 2., or under a disturbed law or concept such as 3. In contrast to the [–original] and [–integral] cases, a [–lawful] case does not even *remind* us of a relevant regularity.[72]

Prägnanz as Simplicity and Prägnanz as Diversity. Two further formal dimensions of Prägnanz are distinguished by Rausch, both of which are of particular relevance in the sphere of aesthetics. Thus there is first of all the dimension of [±simplicity], where that which is [+simple] is harmoniously articulated or organized, as opposed to that which is in its structure complicated or involved, not easily surveyable. As we shall see, the notion of simplicity has a lot in common with aesthetic notions of 'organic unity', and may perhaps be compared also with Ehrenfels' notion of 'purity' (see pp. 118 ff. below). Secondly there is the dimension of [± diversity], a matter of the fullness or numerical stock [*Bestand*], of the multifariousness or manifoldness of a structure. This is the English sense of 'pregnant', a matter of a structure's having a richness of elements, its being fruitful, heavy, significant, weighty, full of something. It is a matter of a wide spread of parts, of internal contours and boundaries, as opposed to that which is meagre, sparse, tenuous.

Prägnanz as Meaningfulness and Prägnanz as Expressivity. It should not however be supposed that Rauschian ideas are limited to the purely formal components of Prägnanz. For perhaps the most interesting aspect of the Rauschian taxonomy of order is his recognition that there are also certain *material* dimensions involved in the notion of Prägnanz, dimensions having to do with the specific natures of given structures, with the environments in which they exist, with the types of mental set, traditions, habits, with which they are associated. These material dimensions – Rausch refers specifically to [± meaningfulness] and [± expressivity] – are therefore also historical; they are subject to different kinds of evolution. Meaningfulness [*Bedeutungsfülle*], in particular, is dependent on given knowledge-states, on knowledge of the connections to other objects in which a [+meaningful] phenomenon stands, and so on.

§13. On Gestalt Aesthetics[73]

We can now see more precisely what is meant by 'Prägnanz-tendencies'. There is, first of all, a general tendency in perceptual experience to experience objects as [+lawful], to the rising and falling of natural parts, the picking out of instances of determinate species or types. There is also a general tendency for experiences of [–integral] formations to shift towards experiences of their corresponding [+integral] formation (for example in optical illusions involving the partial rectification of a parallelogram towards rectangularity).

How, now, does all of this relate to the phenomena of aesthetics? We must point out, first of all, that the perception of works of art, too, will involve the operation of formative tendencies of various sorts. The underlying objectual formation might be a collection of blotches of paint on canvas but what we see, on the basis of a mental set of the appropriate sort, is a painting by El Greco. Or the underlying objectual formation is a collection of bangs and whistles, but what we hear is a piece of music by Ravel. Here the perceptual and cognitive organizing tendencies at work are more elaborate versions of tendencies present already in our understanding of language, where our perception transforms certain kinds of noises in such a way as to constitute phonemes, words, sentences, commands, requests, prayers, and so on. Again, both mental set and reference system, as well as the underlying foundation of objects or processes, are at work in producing that end-result which is a given perceived Gestalt, and we can indeed regard Diagram 8. above as a sketch of that complex whole which is the perception of a work of art. The underlying physical material or process is then to be conceived not simply as an object of perception but rather as a trigger, designed to set going within the observer tendencies to perceptual or experiential order of certain sorts. And the artist's job, from the present point of view, is to supply a trigger that is most adequate to do this job in given circumstances.

We might say that the artist's job is to maximize different sorts of Prägnanz under given conditions. He must seek to produce appropriate triggers for experiences whose resultant objects will manifest (for example) a particularly high degree of harmony and diversity in given circumstances. One might indeed want to go so far as to suggest that – at least for most central types of works of art – value just is degree of Prägnanz. Ehrenfels himself suggested a conception of value along these

lines,[74] defining the 'level' of a Gestalt as the product of its degree of purity and degree of multiplicity (corresponding roughly to Rausch's [+simplicity] and [+diversity] distinguished above). In his "Weiterführende Bemerkungen" of 1922, Ehrenfels writes further that 'what we call beauty is nothing other than level of Gestalt' (p.50 of reprint).

Following on from the work of G. Birkhoff, much of the literature on Gestalt level and related notions has sought to provide a measure of aesthetic value, though even where just the two dimensions of 'simplicity' and 'diversity' are taken into account, quite different mathematical conceptions have been suggested. Thus where Ehrenfels speaks of a 'product' of simplicity and diversity, Birkhoff speaks of a division of these two factors, and Robert Nozick – who employs ideas along these lines as the basis for a general theory of value, not restricted to the aesthetic sphere – has a sum formula, expressed in terms of diversity and 'organic unity'. These two dimensions are, as Nozick sees them, independent:

> Holding fixed the degree of unifiedness of the material, the degree of organic unity varies directly with the degree of diversity of that material being unified. Holding fixed the degree of diversity of the material, the degree of organic unity varies directly with the unifiedness (induced) in that material. The more diverse the material, the harder it is to unify it to a given degree. (Nozick (1981), p.416)

When we do succeed in producing organic unity, then, according to Nozick, we create new value, which arises only in wholes. If we let O(X) represent the degree of organic unity and V(X) the value of some complex object X, having parts X_1, X_2, etc., then we can say that V(X) will be some function of O(X) and of the various $V(X_i)$. As Nozick writes, 'The simplest function will be additive: the value of X will be the sum of the value of X's parts and the degree of organic unity of X.'[75] A mere sum is not organically unified in this sense, and thus its value cannot exceed the values of its parts: 'If the basic dimension of intrinsic value is degree of organic unity, then a conglomerate or aggregate, since it itself has no organic unity, cannot have greater intrinsic value than the total had by its parts. No new intrinsic value is introduced by agglomeration' (*op.cit.*, p.423f.). People, with their greater diversity of parts, will, on a view of this sort, rank higher in value than animals, who will rank higher than plants, who will in turn rank higher than rocks, and so on (*op.cit.*, p.415).

After what has been said above however concerning the various independent dimensions of objectual Prägnanz, it is difficult to believe

that either Ehrenfels or Nozick should have held that it was sufficient to provide a simple two-dimensional conception of value or 'level of Gestalt', without further differentiation. For this is to pay insufficient attention for example to the contribution to value yielded by the lawfulness of a given phenomenon – its representing, in some sense, a perfect (or clear, or focal) instance of its type.[76] It is to leave out further the originality or primacy of a phenomenon, where we are normally disposed to assume that derivative phenomena – simplicity, and diversity, and other things being equal – are of lesser value than the original from which they are derived. Most crucially, however, it is to ignore the material dimensions of value, represented here by the dimensions of expressivity and meaningfulness. For it is in terms of these that it becomes possible to take account of the historically variable features of the world of art, i.e. of those dimensions of aesthetic value that are of specific relevance to human subjects.

Let us suppose, then, that the artist has the task of maximizing Prägnanz in all or even in a number of the given dimensions. It would clearly be a relatively easy matter for him to fulfil this task if there existed just one relevant dimension. But his job is in fact made almost insuperably difficult by the fact that, as we have seen, there exist many varieties of order, some of which are in competition with each other. For the artist cannot know *a priori* how the various different kinds of order will interact in given cases: as the Gestalt psychologists (and their critics) have established, there are no laws as to how the various factors of objectual Prägnanz will react in combination. There are no laws governing which of two given competing factors will overwhelm the other, laws governing the conditions under which factors will mutually support or undermine each other, and so on.

This need not, however, imply that there is just cause simply to abandon the (still nascent) theory of Prägnanz as a basis for the understanding of order and value in the aesthetic sphere. For just as an ethologist, say, may assist our understanding of animal behaviour by providing a merely qualitative investigation of the dimensions affecting the habits of the animals he studies, even when he is unable to predict what these animals will do from one moment to the next, so also the psychologist may advance our understanding of artistic phenomena by providing a morphological investigation of the various dimensions of variation in the phenomena in question. The results of his investigations will not consist in any formula or measure of value, and nor will they

consist in rules which might reflect or dictate the practices of the artist. Rather, they will tell us where we might look for dimensions of aesthetically relevant structure, not only in the works of art he produces but also in the experiences to which these works give rise.

§14. Conclusion

Both the Austrian and the Berlin Gestalt psychologists distinguished themselves by a high degree of concern for the philosophical implications of their work. In the end, however, it must be accepted that this concern did not go far enough. As is seen above all from the lack of any substantial and formally fruitful logical treatment of the wealth of notions clustering around the Gestalt idea, a truly adequate mastering of the philosophical difficulties which surround this idea has never really taken place. And while the brilliance and experimental ingenuity of Wertheimer, Köhler and Koffka led to many empirical advances over the earlier work of their colleagues in Graz, even the proponents of the Berlin theory lacked a wider philosophical framework of the sort that had been provided for the Graz psychologists by Meinong and by Brentano.

Such philosophical, and above all ontological, clarification is needed, for, without an awareness of the nature and interrelations of the objects with which it deals, an empirical science is in a certain sense performing experiments in the dark. It should not, however, be supposed that considerations of the sort sketched above could have direct and immediate implications for the experimental practice of a discipline. The connection between such considerations and scientific practice is of necessity highly remote. Yet philosophy need not, for all that, be insignificant. It is too little recognized that there is something like a philosophical experimentation, a variety of experimentation that can test the strength of ideas in a way that is independent of and complementary to what takes place in the laboratory.

This notion of philosophical experimentation has been today largely forgotten, both by philosophers and by scientists, as a result of the continuing dominance of the positivist orthodoxy within the mainstream of scientific research.[77] For positivism would have it that philosophical and empirical considerations are divorced entirely from each other (that a real science is marked precisely by the fact that it has left behind 'sterile

methodological debates'). From a wider perspective, however, the dominance of positivism has simply meant that *all* scientific ideas have been born out of one and the same philosophical stable; they have as it were undergone already in the womb the only sort of philosophical experimentation that is to be granted to them. The cut and thrust of ontological argument about the very foundations of empirical science that characterized the work of Brentano, Mach, Stumpf, James and others of their generation, has thereby all but disappeared from within the confines of science itself.

I do not claim to have provided the needed ontological clarification of the Gestalt concept here. I do however claim that it is as much as anything else in virtue of the lack of such clarification that the Gestalt idea has failed to establish itself securely within the mainstream of psychology.

This is a strong thesis, and it will be useful if I break it down into a number of weaker constituent theses, making it clear that I do not feel equally strongly about all of them:

– There is first of all the assumption that the Gestalt idea, in any of its variants, has in truth failed to establish itself within the mainstream of recent psychology. There was, especially in the '40s, much talk of a 'convergence' of (e.g.) behaviourism and Gestalt theory, or of the absorption of Gestalt insights by one school of psychologists or another. And it is clear that certain elements of the work of Wertheimer, Köhler, Koffka, *et al.*, and indeed of Mach and Ehrenfels, have come to be absorbed into the science of psychology as a whole. Thus it may be correct to suppose, with Helson in his paper of 1969, that it was Köhler who first evolved a conception of psychic activity which made possible a serviceable physiological approach to the workings of the mind in the modern sense. It may be correct to suppose that workers in the Gestalt tradition such as Wertheimer, Bühler, Duncker and Selz anticipated and indeed influenced modern debates on the possibility of a computational or information-theoretic approach to psychic processing.[78] And it is certainly correct to suppose that many of the empirical facts about perception, about the perception of movement and contour and about perceptual constancy and perceptual illusions – facts we now take for granted – were discovered in the classic experiments performed by Benussi, Wertheimer, Rubin and other Gestaltists. But none of this changes the fact that the central ontological idea of Gestalt structure has all but vanished from psychology.

– Secondly, there is the claim that there is a lack of ontological

clarification on the part of Gestalt psychologists of the notions they employ. Now there is, certainly, interesting philosophical work within the Gestalt tradition. The writings of Rausch, above all contain philosophical investigations of a high order, and what has been offered above is only a sample of the wealth of ideas within his works. Rausch combines the insights of an experimental psychologist with a grasp of the techniques of modern logic, and he has succeeded in addressing many of the most pressing ontological issues surrounding the notion of Gestalt in ways that have proved also empirically fruitful. Yet Rausch has been an isolated figure, his work has remained practically unknown and entirely untranslated, a fate he has shared with the earlier Austrian writers on the ontology of Gestalt (so that it is only now, with the publication of this volume, that Ehrenfels' "Über 'Gestaltqualitäten'" will appear in print in English). The work of Meinong, too, has been little read by psychologists, and Meinong is today remembered principally for his contributions to pure ontology. Stumpf, on the other hand, has suffered the opposite fate: he is treated with respect as a seminal figure in the psychology of music, yet his posthumous philosophical masterpiece on the theory of cognition remains unread.

– There is, thirdly, the assumption that, if the appropriate ontological clarifications of Gestalt were forthcoming in an accessible form, then the present unhappy state of affairs would come to be rectified and Gestalt notions would once more play a significant role in psychological inquiries. I am not sure about this at all, and not only for reasons having to do with the gratuitous and serendipitous character of scientific change. For I am not sure that such clarifications *can* be provided (and the present volume is little more than ground-clearing round the fringes of the problem). Moreover, it seems that even if they were provided, there may still be reasons why the nitty gritty of perceptual psychology would have to be centred around problems skew to a Gestalt-theoretical treatment.[79] There are, however, areas outside perceptual psychology – above all in linguistics and in artificial intelligence[80] – where ideas and issues similar to those found in the Gestalt tradition seem once again to be playing an important role.

– Finally, there is the thesis to the effect that the attempt to provide such clarification is worthwhile. And here I should like to insist very strongly that the ideas of Mach and Ehrenfels, of Meinong, Benussi, Witasek and Bühler, of Wertheimer, Köhler and Koffka, of Lewin, Katz and Rubin, of Musatti, Metzger, Rausch and Kanizsa, of Heider,

Michotte and Thom, contain the germ of an important idea, an idea which – if it can be stripped of the exaggerated claims which were sometimes made on its behalf – can help us to achieve a deeper and more adequate understanding of both psychological and non-psychological complexity. There is, in other words, more than a merely historical reason (curiosity) for studying the works of the Gestalt psychologists, as I hope the remainder of this volume will help to demonstrate.

Notes

[1] See above all the writings by Dreyfus listed on p. 269 below, and compare also Smith (1987a). Taking advantage of the Bibliography to the volume as a whole (see pp.231–478), I have provided only the briefest indications of the Gestaltist literature in the notes that follow. References to items in this Bibliography are given by author and year *without* parentheses, thus: 'Ehrenfels 1890'. References in which the year is surrounded immediately by parentheses – as in 'James (1890)', etc. – designate items in the list on pp.79ff. at the end of the present essay.

[2] See, on this, Fabian 1986.

[3] Brentano's seminal ideas in this area formed the substance of lectures in Vienna which were attended by Ehrenfels, as indeed also by Meinong and Husserl. Brentano's own notes to these lectures are now accessible as Brentano (1982); see also Mulligan and Smith (1985). Note that Brentano himself did not accept the doctrine of Gestalt qualities in any of its manifestations, and in his later writings he fought hard against the acceptance of all '*entia rationis*'. Kraus 1921 is a critique of Gestalt psychological ideas from this, orthodox Brentanian perspective.

[4] The paper can therefore be seen as a philosophical supplement to Ash 1982, an excellent historical study of the origins of Gestalt psychology in Germany, from which I have profited greatly.

[5] Hering's work – and especially his *Outlines of a Theory of the Light Sense* – also contains considerations of the relationship of psychology and physiology related in important ways to those of Köhler 1920: see Ash 1982, pp.93-109. Other German thinkers who would have to be taken into account in any complete exposition are Wilhelm Stern, and also Wilhelm Dilthey, whose concept of *verstehender* vs. *verstandener Zusammenhang* was known to both Wertheimer and Köhler.

[6] Both these countries have shown a marked lack of acceptance of the Gestalt tradition, as the Bibliography below makes clear. One possible explanation is suggested in the passage appended to the entry for Stout 1896 on pp. 443f below.

[7] It should be noted however that James sees figured consciousness as pointing merely to the subtlety of the *associative* mechanisms involved in mental processing.

[8] The term is used for example in relation to the bread and wine of the Eucharist. As Clemens Brentano, Franz Brentano's uncle, wrote:

> brod und wein, die zwei gestalten,
> sind nur zeichen, sie enthalten
> gottes volle wesenheit (*Gesammelte Schriften*, 1, p.155.)

[9] *Vom Krieg*, sketches of Book 8, Part I, quoted in Metzger 1940, p.7f. of 5th ed.

[10] See also Lipps 1913.

[11] Schapp 1910 contains an extensive treatment of qualities of this sort.

[12] See Smith (1986a) and (1987) for further reflections on the comparison between Husserl and Ehrenfels. See also Küng (1975), on Husserl and Carnap.

[13] See Smith (1986a) for more details of Husserl's theory of species and identity in the *Logical Investigations*.

[14] A conception of perceptual acts along these lines is defended in Smith (1984). See also Mulligan and Smith (1986). I shall come back to Gestalt-theoretical views on the relationality of perception in §9 below.

[15] Both Meinong and Ehrenfels were almost certainly influenced in this respect by the theory of 'higher order economic goods' put forward by the Austrian economist Carl Menger under whom they both studied in Vienna. See in particular Menger's *Grundsätze der Volkswirtschaftslehre* of (1871).

[16] It is worth noting in passing that the world of experience thus conceived has much in common with the world of Brentano's mature ontology. Brentano has no room for physical things in the standardly accepted sense. He sees the world rather as a kind of sensory surface, capable of being partitioned into constituent sub-surfaces more or less *ad indefinitum*. To some of the sub-surfaces thereby generated a certain 'thing-character' may then be subjectively imputed. See Brentano (1933), Smith (1986b). A Gestalt-theoretical view of substance along these lines was developed also by the Meinongian Kreibig in his 1909.

[17] Husserl himself was heavily influenced by Stumpf, as is shown by the dedication of the *Logical Investigation*. On the influence of Brentano on Stumpf see McAlister, ed. (1976), pp.42f.

[18] Judgments and conceptual thinking in general also have special objects in Stumpf's philosophy, and indeed Stumpf was primarily responsible for introducing the term '*Sachverhalt*' in the sense of 'judgment content' or 'objectual judment correlate' as a technical term of philosophy. See his 1907. Our exposition here is however taken not from this work, but rather from Stumpf's two-volume *Theory of Cognition* of 1939/40, which still manifests a continuity with his earlier thinking. Note that the Stumpfian conception of Gestalt structure is shared also by Karl Bühler in his writings on Gestalt (see esp. his 1913), as also for example in Brunswik 1929.

[19] This restrictive notion of Gestalt will prove to be of some importance in the treatment of aesthetic phenomena, since it seems that value, in the aesthetic field, is always such as to involve just that articulate complexity which is here at issue.

[20] Meinong was in fact responsible for establishing the first laboratory of experimental psychology in Austria, and the school which he founded in Graz was the first to carry out experiments in 'Gestalt psychology' in a systematic way. The results of these experiments are presented above all in writings of Witasek, Höfler, Ameseder and Benussi. Variants of the production theory were defended also by G. E. Müller and his associates, by G. Anschütz, and later by B. Petermann.

[21] 1911, p.391. Benussi hereby accepts at least one form of the constancy hypothesis, i.e. a form of the view that what is given in sensation is determined exclusively by the relevant objective conditions and that, from occasion to occasion, qualitatively similar objective conditions give rise to qualitatively similar sensations. See Köhler 1913 and, from a more philosophical perspective, Gurwitsch 1955, part III.

[22] 1904, p.394; 1914a, p.407.

[23] See Stucchi 1988 for a detailed account of the development of Benussi's thought.

[24] See Musatti 1929, p.32. Quoted by Stucchi, *loc. cit.*

[25] Benussi himself was, like Kanizsa and Metelli, born in the old k.u.k. Hafenstadt of Triest, and the extent to which we are still dealing here with a characteristically Austrian (Austro-Hungarian) tradition in Gestalt psychology is well-illustrated by the fact that the name 'Kanizsa' originates with the nobility of Southern Hungary.

[26] One can understand why empirically-minded psychologists should be attracted to such a theory if one reflects that, on the basis of a Helmholtzian retinal image theory of visual sensation, what is not in the retinal image cannot be *seen*, and must therefore be added by thought. Cf. Hochberg 1974a.

[27] See e.g. Michotte and Burke 1951.

[28] See Michotte 1946, ch.17. Michotte distinguishes, for example, between that type of causality which is a matter of the *launching* of one object by another, and that type of causality which is a matter of *entrainment*, where one object drags another along in its wake. Both involve the spread of movement from one object to another, perceived as involving productiveness or generation.

[29] Petitot has in addition shown how catastrophe theory can be used to throw light on theories of case and grammatical valence, as also on the idea of a dependency grammar in the manner of Tesnière. See his 1982, and also now the second volume of Petitot (1985/86). These topics are illuminatingly treated also in Wildgen (1985).

[30] The idea of a Gestalt linguistics which would take account of more than merely linear relations within the purely linguistic level has been developed also by Lakoff. The idea is present further in Fillmore's concept of 'frame structures' (see his 1981), in the idea of canonical sentence patterns employed by Slobin in his work in developmental linguistics, and in the recent book on semantics and cognition by Jackendoff. Thus Fillmore, for example, stresses the holistic aspect of the frames or 'scenes' which his theory employs, noting that an entire frame, an entire system of functionally interconnected linguistic units, is brought into play, is 'activated', whenever a speaker uses some one of the constituent verbs (1981, p.73).

[31] Our presentation here is to a large extent a summary of the ideas in this work, though we are clearly unable to do justice here to the mathematical foundations of these ideas.

[32] In more recent work, Wildgen has shown that there is the possibility of producing, on the basis of Thom's work, a theory of inferences between linguistic Gestalten. This produces inferential systems which in some respects echo the grammatical inferences treated at the end of §6 of Smith and Mulligan 1982, though enjoying a greater mathematical subtlety.

[33] Benussi 1914a, pp.399f. See however 1904, p.394 and also Ameseder 1904, pp.495, 506.

[34] Benussi 1914a, p.403.

[35] *Op.cit.*, p.33. Koffka's notion of mental set or *Einstellung* (*op.cit.*, p.34) is derived from the work of the Würzburg school of Oswald Külpe.

[36] Here the single lines connecting broken to solid walls of adjacent frames represent relations of one-sided dependence, double lines connecting adjacent broken walls represent relations of mutual dependence and the inclusion of one frame in another is to signify, in the manner of Venn or Euler diagrams, the relation of part to whole. See §6 of Smith and Mulligan 1982 for further examples of such diagrams. Compare also the parallel diagram of the state of affairs and associated acts of judgment and presentation in Smith (1987).

[37] This does not, however, imply a Spinozism *à la* Mach (see §12 of the paper by Mulligan and Smith below). Koffka does *not* claim that the universe forms a single 'organic whole': 'just as the category of causality does not mean that any event is causally connected with any other, so the gestalt category does not mean that any two states or events belong together in one big gestalt.' (*ibid.*)

[38] Ehrenfels, too, of course, recognized the Gestalt character of actions. Actions are, for example, transposable: Fritz can *chase the cat* either by running *uphill*, or by running *downhill*. The most philosophically sophisticated treatment of the Gestalt character of actions is however to be found in the writings of the French phenomenologist Merleau-Ponty. See especially his 1942 and 1945.

[39] See Luchins and Luchins 1970, vol.III, p.271, and the (unpublished) note 2 to Luchins 1982.

[40] Boring 1929 (ch. 17 of 2nd ed.) sees the moment of unity of this tradition as lying in the fact that its members embraced one or other form of nativism, as contrasted with the empiricism of Wundt, Helmholtz and their followers. Contrast, however, Pastore 1974 and, for the specific case of Stumpf, Smith (1986).

[41] See Smith 1981 on Kafka, Marty and Ehrenfels in Prague. See also Brod and Weltsch 1913. To the wider intellectual community there belonged also the Prague linguists, Trubetzkoy, Mathesius, Jakobson, and others; relations between Prague structural linguistics and Gestalt psychology have still to be investigated.

[42] See Bergmann (1974), esp. pp.388ff.

[43] See Ash 1982, pp. 165, 225.

[44] Wertheimer was influenced also by the Würzburg school and in fact took his doctorate with Külpe in 1905. See Ash 1982, pp.250ff., who also provides

details of the later careers of Wertheimer, Köhler and Koffka in universities outside Berlin, before their successive emigration to the United States.

[45] Exactly the same danger manifests itself in relation to the theory of *noemata* set forth by Husserl in his *Ideas* I, and there are many similarities between Husserl's noema theory and the theory of perceptual Gestalten, especially in its Grazist variant. Thus where noemata were conceived by Husserl as peculiar abstract entities accessible to the subject only in a special sort of reflection, higher order objects were conceived by the Graz psychologists as irrealia accessible only in a special 'act of production'. As the Berlin psychologists showed however, it is possible to develop a conception of Gestalten as naturally existing entities – indeed as the primary and most straightforward objects of presentation – in a way which would make them capable of investigation within a naturalistic framework.

[46] When account is taken also of the movements of the eye and head, then there is revealed an even greater degree of transparency of perceptual contact across the entire range of everyday experiences. This, surely, is the principal lesson of J. J. Gibson's work.

[47] This difference of emphasis in the work of Köhler and Wertheimer comes out particularly clearly in some of Wertheimer's later seminars. See e.g. Luchins and Luchins 1972/74, vol. II, p.160 (passage quoted in Keiler 1982, pp.259f.).

[48] Whether this Wertheimer-Köhler-Koffka-Gibson theory of the relationality of perception can be extended to produce a coherent account not merely of perception but also of what is involved in the *truth* of judgments is still an open question. Mulligan, Simons and Smith (1984) can be seen as a step in this direction. See also Schuhmann and Smith (1985), on an anticipation of Gibsonian realism in the work of the realist phenomenologist Johannes Daubert, as also the work of E. S. Reed (for example his (1983)).

[49] On the first of these, a comprehensive study of different kinds of summative and non-summative wholes, see §6 of Smith and Mulligan 1982.

[50] All the references in what follows are to Rausch's paper 1966a, unless otherwise stated. It must however be stressed that Rausch limits his remarks to phenomenally given properties, and he would almost certainly have reservations in regard to some of the more general applications which his ideas receive in the text.

[51] Recall Stumpf's discussion of the conditions which a tone sequence must satisfy if it is to be a melody.

[52] Rausch 1937 showed that there are more than 1000 different types of summative and non-summative wholes, even when only relatively simple formal criteria of 'summativity' are taken into account.

[53] On the importance to biological reasoning of such whole-properties and of the general concepts of distributivity and non-distributivity see Darden and Rada (forthcoming).

[54] Exercises in ontological parsing of the sort here illustrated were familiar to Brentano's students and are at the basis of Brentano's own theory of substance and accident: see Smith (1986b). Rausch in fact argues that the capacity to submit to such re-parsing, to be transformed from a (1-place) *property* to an (n-place) *relation*, is a *criterion* of Gestalt-connection in the classical sense

(pp.871f.). It is absent, e.g., in those cases where a continuum serves as underlying complex.

[55] See Rausch 1966a, pp.873f., 902f., Metzger 1941, ch.2, Pratt 1962.

[56] 'A complex is the more a Gestalt...the *clearer* is the complex quality belonging to it. A complex quality is the more a Gestalt quality...the *clearer* it is.' (p.879)

[57] The doctor, for example, will refer to *the case of influenza* in the sixth bed on the right.

[58] Note that the transformations which take us back and forth between [A] and [C] are not confined to the sphere of dependent qualities: they can be applied wherever we have a group of objects unified together, some one of which is relatively insignificant in relation to the whole. Thus we say that the button is on the one hand *part of* the coat, and on the other hand *on* the coat. There is no contradiction here, since two different oppositions are at work. On the one hand 'coat' means the object to whose constitution the button belongs, on the other hand it means an object which is made exclusively of textile material (p. 898; cf. Metzger 1954, pp.141f. of 5th ed.).

[59] This should not, of course, be understood as implying that there is no truth of the matter in any given case (as though the structures of Gestalten could vary in reflection of the way in which the theorist chooses to describe them). Rather, each of the given alternatives – and of course equivalent descriptions of the vastly more complicated cases with which one would normally have to deal – are merely different ways of formally articulating strictly identical material.

[60] Very similar ideas are present in the 3rd of Husserl's *Logical Investigations* which may indeed have influenced Wertheimer here. Among psychologists the concept of part-property had been introduced before Wertheimer by F. E. O. Schultze in 1906 as the concept of what he called *effect-accents* ['Wirkungsakzente']. Schultze did not see, however, that such properties can be treated in correlation with whole-properties: he contrasted the theory of effect-accents with that of Gestalt qualities, but did not integrate the two (cf. again Rausch 1966a, p.894).

[61] See the work on 'SMT' of Stadler and his associates for interesting empirical investigations along these lines.

[62] Cf. Köhler 1920.

[63] Indeed we could say that for Ehrenfels it is in every case the personal unity of consciousness which is the properly integrating moment of a Gestalt. For when elements are spread in different consciousnesses their unity is lost. (Cf. Rausch 1966a, p.888f., and pp.MM below.) Benussi, too, investigated the properties of different kinds of dependent Gestalten: see especially his 1904.

[64] The conception of linguistics as a study of successive levels of interrelated part- and whole-properties has been canvassed most consistently by Roman Jakobson (see e.g. Holenstein (1975) and works there cited). Compare also Harris (1951) for similar developments within American structural linguistics.

[65] See Rausch 1966a, p.899 and also Rausch 1964.

[66] Cf. Rausch 1966a, n.9.

[67] The notion of 'reference system' that is employed in what follows may be regarded as an informal equivalent of the technical Gestaltist notion of '*Bezugssystem*': see e.g. Witte 1966a.

[68] On Gestalt theory in modern philosophy of science see e.g. Kuhn (1962), pp.174, 184; Hanson (1958), pp.10ff., 179ff.; perhaps also Polanyi 1958, 1966. For Wittgenstein see especially his *Philosophische Untersuchungen* and *Bemerkungen über die Philosophie der Psychologie*. Compare also the remarks on numbers as Gestalten in the *Bemerkungen über die Grundlagen der Mathematik* (e.g. pp.150, 229f. of the German edition) which will immediately recall Wertheimer 1912.

[69] Gestalt investigations of such tendencies have in some respects anticipated later work on the stereotypicality of cognition and perception, of the role of the opposition between focal and derived or modified instance, e.g. on the part of E. Rosch and her associates. They are echoed also in the treatment of 'typicality' in the writings of the later Husserl, as when he writes:

> The factual world of experience is experienced as a typified world. Things are experienced as trees, bushes, animals, snakes, birds; specifically, as pine, linden, lilac, dog, viper, swallow, sparrow, and so on... What is given in experience as a new individual is first known in terms of what has been genuinely perceived; it calls to mind the like (the similar). But what is apprehended according to type also has a horizon of possible experience with corresponding predilineations due to familiarity and has, therefore, types of attributes not yet experienced but expected. When we see a dog, we immediately anticipate its additional modes of behaviour: its typical way of eating, playing, running, jumping, and so on. We do not actually see its teeth; but although we have never before seen this dog, we know in advance how its teeth will look. (Husserl (1939), §82a, Eng. trans., p.331)

[70] The terminology here employed, adapted from the literature on distinctive features in linguistics, should not be taken to imply that we are dealing here with simple binary oppositions: we have in each case to deal with different kinds of graded or scalar phenomena, with phenomena capable of *Steigerung*, of greater and lesser intensity.

[71] See p.917, cf. also Metzger, *Gesetze des Sehens*, p.223 of new edition.

[72] In all of these cases Rausch is referring, we must remember, exclusively to *phenomenal* moments: his theory of the dimensions or distinctive features of Prägnanz, as of part- and whole-properties in general, is intended merely as a contribution to the understanding of phenomenal experience. It has generated interesting empirical work in this regard: see e.g. Stadler, Stegnano and Trombini 1979.

[73] The section which follows is confined to a discussion of the relevance to aesthetics of the Gestalt idea of Prägnanz. Thus it does not take account of other Gestalt literature on aesthetic matters such as, most importantly, the writings of Rudolf Arnheim.

[74] See his paper, "Gestalt Level and Gestalt Purity" translated below.

[75] *Op.cit.*, p.423. In a footnote Nozick adds: 'More precisely, given different partitionings..., it will be the maximum *relative to some partition*' (my emphasis).

[76] See Witasek 1904, for a treatment of aesthetic value in which lawfulness in this sense is taken into account. Compare also Smith 1985, 1988. Lawfulness is of course important also in serving as a presupposition for the other distinguished dimensions.

[77] This orthodoxy has for some years now been called into question within the mainstream of philosophy. In the sphere of science proper it has been challenged above all by linguists.

[78] Thus the early debates on mechanistic vs. non-mechanistic approaches to psychology parallel current debates within artificial intelligence. See e.g. Dreyfus 1972, a work which is indeed indebted to the Gestalt psychologists. Interestingly, some members of the Graz school, as well as the important but neglected German Gestalt psychologist Otto Selz, anticipated in their work on cognition important aspects of more recent approaches in cognitive psychology. See e.g. Neisser 1976, and Frijda and De Groot 1981 (especially the contribution by Herbert A. Simon).

[79] See e.g. Pinker (1984).

[80] Consider, for example, some of the ideas underlying the programme of connexionism.

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