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72

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Colours, Corners And Complexity

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COLOURS, CORNERS AND COMPLEXITY: :
MEINONG & WITTGENSTEIN ON SOME INTERNAL RELATIONS*
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- §1 Introduction
- §2 Colour Space and Colour Geometry
- §3 The Colour Square vs the Colour Circle.
The **juste milieu**
- §4 Visual Space and Colour Space
 - §4.1 Orientation Space: Corners
 - §4.2 The Dimensions of Colour Space
 - §4.3 The Nature of Elements
- §5 Developments and Applications
 - §5.1 Tractarian Complexity
 - §5.2 The Variety of Colours
 - §5.3 Internal Relations and the Analysis of Perception

§1 Introduction

"There is a philosophical question as to what one really sees"¹. Wittgenstein's remark raises all sorts of questions: Does one see tables and chairs, people jumping up and down, their jumps, their sadness ? Does one see colours and forms, coloured forms, dynamic and static, that are above or to the left of other coloured forms ? If the latter, are these things one sees private entities or public entities as are, presumably, tables and chairs ? If both answers are legitimate (sometimes, or whenever we see ?) what are the relations between the people we see and the coloured forms that we also see ? In other words, is what is presented to me in my visual field private, public or partly private and partly public ?

In what follows I studiously avoid all such questions in order to concentrate on a prior matter. What sort of relations obtain between colours and between orientation properties ? On nearly all answers to the questions in the last paragraph such entities do occur at least sometimes in our visual fields. In particular I shall be looking at what the two Austrian philosophers, Meinong and Wittgenstein², have to say about **internal relations** between colours and between orientation properties. A third type of such entities, perceived spatial form, was the subject-matter of many Austrian discussions and also fascinated Wittgenstein.

¹ Malcom's summary of Wittgenstein's lectures in 1946, Malcolm 1967, 49.

² No one has done more than Karel Lambert to bring out the coherence and interest of one of Meinong's best known theses. What follows will, I hope, help to show that there are more things in Meinong's philosophy than his account of definite descriptions and their objects.

But I shall ignore it here³ just as I shall bracket the question whether the redness of the object I see, or its being to the left are or are not phenomenal or mind- dependent properties.

The descriptive phenomenology of colours and other qualities I shall expound and explore in what follows is that set out by Meinong in his 1903 paper "Remarks on the Colour Solid and the Law of Mixtures" and by Wittgenstein in lectures and writings in 1930, in particular in his **Philosophical Remarks**. Meinong's paper was published only six years after his pupil Höfler had described the colour solid in his **Psychologie** and is the most thorough account of the philosophical issues raised by this representation of the structure of colours.

Although, as we shall see, there is considerable agreement at the descriptive level between Wittgenstein and his Austro-German predecessors, Wittgenstein's claims about his descriptions differ radically from the claims made by his Austro-German predecessors such as Meinong about the same descriptions. Here I shall mention only two such differences. First, Wittgenstein's descriptions serve a number of purely practical purposes; those of Meinong and the other descriptive psychologists such as Husserl and Stumpf have a purely theoretical goal. Meinong, unlike Wittgenstein, took his account of the internal relations amongst colours to provide a scientific foundation for the empirical theories of colours developed by empirical psychologists. Wittgenstein, of course, had no such ambition although, like his Austrian predecessors, he did think that description was logically prior to empirical explanation and accounts of the causal genesis of phenomena (cf. PR §1)

Secondly, Meinong and Wittgenstein had very different views about the status of the sentences that deal with internal relations amongst, for example, colours. Meinong introduces his distinction between apriori and empirical propositions with the contrast between, on the one hand, the three propositions

Red is different from green
Grey lies between black and white
Orange lies between yellow and red

and

The stone is falling

The first three, unlike the fourth, are, he says, necessarily true (UEW §1). For Meinong descriptions of internal relations amongst colours are made true by the obtaining of necessary relations. The dimensions of colour space are "natural" (BFM 522). For Wittgenstein, of course, the obtaining of internal relations and properties cannot be asserted (TLP 4.122), a negative point to which Wittgenstein was to remain attached even after he had changed his mind about what was to count as internal. We cannot justify rules of grammar by sentences like "There really are four primary colours" because such rules are arbitrary (Z §331); a colour system does not reside in the nature of colours (Z §357, LWL 8, 12). A full account of this difference between Meinong and Wittgenstein would of course involve examining the theories of internal relations and of necessary truths developed by the descriptive psychologists and the criticisms of positions like theirs by Schlick and

³ See Mulligan 1988, 1991; Smith (ed.) 1988.

Wittgenstein in their defences of the view that genuine propositions always describe contingent situations⁴. Such questions will also be bracketed in what follows.

In spite of important differences such as these it is a striking fact that the one recurring theme in Wittgenstein's philosophy for which little in Frege or Russell prepare the reader and which was to mean little to his successors is the nature of internal relations in general and of formal concepts in particular - just the theme that recurs in the writings of Wittgenstein's Austrian predecessors, Husserl and Meinong.

In §2 I outline the now unfamiliar view that there is a purely formal notion of space of which the internal relations amongst colours provide one example. In §3 some features of colour space according to Meinong and Wittgenstein are described. §4 sets out the details of Meinong's views on internal relations amongst colours and amongst orientation properties. §5 mentions three applications of Austrian views of internal relations.

§2 Colour space and colour geometry

The **Philosophical Remarks** refer to a remarkable number of different **spaces**: colour space (§1), auditive space (§42), tactile space (§214), pain space (§82), visual space (§206), kinaesthetic space (§73), a space to which both memory and reality belong, the spaces of movement (§140) and of orientation (§207) and the dark- light space (§45) - to mention only a few. The project of describing such manifolds goes back to the work of such heirs of Brentano as Stumpf, Husserl and Meinong who, taking up some remarks of Riemann, envisaged descriptions of the manifolds that constitute mental states and acts - kinaesthetic and perceptual states, judgement and supposition etc., of the manifolds of the (possible) objects of such acts as well as descriptions of the manifolds embracing both of these. Like Wittgenstein, the descriptive psychologists, up to and including the Gestalt psychologist-philosophers, envisaged descriptive investigations of the internal relations amongst colours as well as tones, harmonies and even electrical charges (PR §§81, 3-4).

Meinong in particular had described such claims as that "colours constitute an at least three-dimensionally extended manifold (**Mannigfaltigkeit**)" as belonging to "colour geometry", a discipline whose "cognitive dignity" would, once developed, be quite comparable to that of geometry (BFM 408-9). What Wittgenstein in **PR** called the colour system and the grammar of colour is later called, en passant, colour geometry (BF I §66, BF II §86; cf. Z §346, BF III §3, §86, §154). But whereas the descriptive psychologists aimed to describe a variety of different spaces in terms of a theory of manifolds and variations along interdependent dimensions the concept that does all the work for Wittgenstein is that of a scale or yardstick (**Massstab**, PR §82), for example a colour scale ("Yardstick and Propositional System", in PR); it is the applications of such a conventional system that underpin the - perhaps only metaphorical - extension of the concept of space to the domain of colours and elsewhere.

⁴ A proper appreciation of the difficulties here presupposes a grasp of the theory of materially necessary truths developed by Husserl in the third of his **Logical Investigations** and of the differences between this theory and the only superficially similar Kantian account of synthetic a priori judgements.

Colour geometry, like the grammar of colours, describes internal relations between colours. An internal relation, in contrast to an external one, is a relation such that if its terms exist then the relation obtains⁵. What, then, are the terms of internal relations ?

One important negative feature of such platitudes as the example already mentioned, "Orange lies between yellow and red", was noted by Meinong: such relations do not describe relations between things. But Meinong's positive account of the terms of such relations is unclear: he says that colour geometry deals with the nature (**Beschaffenheit**) not the existence of objects (BFM 499, UA 193, UEW 10) indeed the existence or non-existence of objects that have such properties is irrelevant when one is describing necessary or internal relations (Meinong 1882, 38; UEW §1). But elsewhere Meinong claims that colour geometry is a branch of the theory of objects, of ideal incomplete objects (Meinong 1907, 121, 134). And then again, after correctly distinguishing between the colour green and green things, he tells us that the former is an ideal property (Meinong 1906, 26-7)⁶, a view shared by Höfler (Höfler 1897 §22).

When Wittgenstein talks of "internal properties and relations" in the **Tractatus** he gives the example of two blue colours standing in the internal relation of brighter than/darker than. But he calls these two colours "objects" and goes on to add, helpfully, that his "vacillating use" of "property" and "relation" corresponds to his vacillating use of "object" (4.123). Although the view that there is a philosophically clear distinction between predicates and subjects, properties and their bearers, is heavily criticised in PR, grammar is, we are told at PR §7, a "theory of logical types". And when Wittgenstein discusses colour incompatibility he does not hesitate to talk about incompatibility between different degrees of a property (PR §80, cf. §207). Much later, at the beginning of his **Remarks on Colours**, Wittgenstein writes:

A language-game: Report whether a certain body is lighter or darker than another.- But now there's a related one: State the relationship between the lightnesses (**Helligkeiten**) of certain shades of colour.....- The form of the propositions in both language games is the same: "X is lighter than Y". But in the first it is an external relation and the proposition is temporal, in the second it is an internal relation and the proposition is timeless (RC I §1)

Meinong and Wittgenstein, then, seem to think that internal relations obtain amongst non-things. And for many ontologists this is also to claim that they obtain between entities that do not change. If we try to get a positive account of the terms of internal relations we run up against their vacillating use of "property" and "object". In Meinong's case the vacillation is

⁵ This well known characterization of internal relations is to be found at Höfler (1897, §22). Höfler refers back to Höfler/Meinong 1890 §25 and §55, which in fact merely anticipate the later formulations. The terminology of "innere" and "äussere Beziehungen" is Höfler's rather than Meinong's. (See also Höfler 1930 §22, Höfler 1922 §25). Meinong marks the difference between the terms of an external relation and those of an internal relation by calling the former "members" and the latter "fundamenta" (Meinong 1899 §7; cf. also Höfler/Meinong 1890 §25).

⁶ Meinong and his school became aware of the philosophical importance of the theory of relations around the same time as Russell, even though they never had a logic of relations. Thus Meinong's collaborator the mathematician Zindler had stressed the philosophical importance of the fact that relations can have more than two terms (on this, see Meinong 1899, 196). Höfler (1896) deals with complex relations.

probably due to the fact that he never managed to provide a clear account of the relations between incomplete (variable) objects and properties. (The same is true of Husserl). Nevertheless Meinong is quite clear that internal relations amongst colours are not relations amongst psychological entities, indeed he considered his account of colour geometry to be one of his main credentials as an opponent of Psychologism: "colours are as little psychological as places or numbers" (BFM 498). Colours and their relations are merely the possible objects of psychological states⁷.

Are there any internal relations amongst things? If Kripke is right about identity, then numerical difference would be such a relation. Meinong suggests that numerical difference between colours is an internal relation: its terms are fundamenta, and if these are "different then they **must** be different, where this word has the sense of 'logically necessary'". And his formulation suggests that numerical difference is always a necessary relation, i.e. even if it obtains between two things (Meinong 1899, §7). But this seems to be the only example of an internal relation between things that is entertained by Meinong⁸.

Do internal relations hold only between ideal entities - objects or properties? Are the only entities that do not change ideal entities? There **is** an ontological category looked on with favour by the early Meinong and Husserl that yields candidates for the role of terms of internal relations which are temporal and non-repeatable: the category of **moments**, or individual qualities, the redness of this cheek which is numerically distinct from, although exactly similar to the redness of some other cheek⁹. The category of moments is particularly attractive for the nominalist since it allows him to give an account of internal relations that dispenses with Platonic terms for these relations: each of the two rednesses is as temporal and unrepeatable as is the cheek in which it inheres, yet between these two rednesses there obtains the internal relation of being as dark/light as.

In spite of their fundamental lack of clarity as to the formal type to which the terms of internal relations belong our two Austrian philosophers share the conviction that the internal relations amongst colours are best represented by the colour octahedron. "An octahedron with the pure colours at the corner points e.g. provides a **rough** representation of colour-space.....Using the octahedron as a representation gives us a **bird's eye view** of the grammatical rules" (PR §1). As Meinong's pupil Witasek puts it, this spatial representation of the "system" of empirical colours provides us with the best "bird's eye description" we have (Witasek 1907, 148).

Such a grammatical representation "tells us what we can do....But grammar is not entirely a matter of arbitrary choice. It must enable us to express the multiplicity of facts, give

⁷ How Meinong thought this point should be reconciled with his late theory of perception, according to which colours cannot actually be seen, since they are not mind-independent, is a story that cannot be told here. Cf. UEW §8.

⁸ Wittgenstein at one point entertains the hypothesis that "the things themselves" include the four primary colours (PR §147). This remark is particularly interesting for those who think that Tractarian objects correspond to what have traditionally been called properties, whether ideal or non-repeatable and for those who think that they correspond to ideal objects. On whether the colours discussed by Wittgenstein in **Remarks on Colour** are properties or "logical subjects", see Chisholm 1990 and Westphal 1987.

⁹ On this category, see (ed.) Smith 1982.

us the same degree of freedom as the facts" (LWL 8). It should be noted that although Meinong and Wittgenstein differ on the question whether the basis of the internal relations they are interested in is conventional they both stress that the geometry of colour allows for, indeed requires what Meinong calls "independent variability" within each of the dimensions in a given manifold with respect to the other dimensions (BFM 499).

What does such a bird's eye view, an **übersichtliche Darstellung**, represent? We have considered the question as to which **formal** categories the entities so represented belong (ideal objects or properties, non-ideal or temporal moments). But what **material** category do they belong to? Does "colour" mean pigment, the colours we see and imagine, or possible colours no one has seen?

Both Meinong and Wittgenstein are emphatic about the distinction between "physical" colours, or pigment, on the one hand, and "psychological" and ideal colours, on the other hand and the corresponding distinction between two types of colour mixtures (BFM §§11-18; PR §218).

One aspect of the distinction between empirical and apriori truths about colours that exercised Meinong's attention is the question whether the colours we sense and imagine exhaust the domain of colours. He first considers the parallel question about tones that is also discussed by Wittgenstein: does the musical scale carry within it an infinite possibility of being continued?

The finitude of the musical scale can only derive from its internal properties. For instance, from our being able to tell from a note **itself** that it is the final one, and so that this last note, or the last notes, exhibit inner properties which the notes in between do not have (PR §223)

Meinong too thinks that quality series are "in principle limited": the last member of the scale is "something that is psychologically given". But he immediately introduces a distinction that can make no sense for someone who, like Wittgenstein, believes that the system of colours or tones does not reside in the colours and tones themselves: the real, psychologically given colours are in principle limited, not so all possible colours (BFM 505).

Our knowledge of colour space is as apriori in nature as our knowledge of real space: it is colour geometry. Our knowledge of the colour solid is empirical in nature and to this extent colour psychology: but apriori elaboration of what has been obtained empirically is as little excluded here as elsewhere in the empirical sciences (BFM 534, cf. 507f.)

(Meinong mentions theoretical mechanics as an analogous case). It is because of this distinction between actual, psychologically real and merely possible colours that Meinong is prepared to entertain the possibility that colour space may exhibit more than three dimensions.

The main types of internal relation between colours distinguished by Meinong and Wittgenstein are: the relations of order and distance and the special cases of kinship or similarity and contrast. (We shall look at a fifth relation, incompatibility, in §4 below).

Consider "the position of the complementary or contrast- colours on the colour solid"¹⁰.

We have apriori insight into contrast in the sense of opposition (**Gegensätzlichkeit**) in the case of the colour tones. That a certain red is opposed to a certain green as the colour at the greatest distance from it, and likewise for a certain yellow and a certain blue, such that all other colour tones exhibit a lesser difference of distance - all this I can see within certain modes limits of reliability as following from the nature of the different colour tones and to this extent apriori (BFM 501)

"One could say that the colours have an elementary affinity with one another" (PR §76). Later, in the **Remarks on Colour**, Wittgenstein says of the relations of kinship and contrast among colours: "that is logic" (RC II §46)¹¹

§3 The Colour Square vs the Colour Circle. The **juste milieu**

Meinong and Wittgenstein both thought that the colour octahedron, and in particular the square with the four corners corresponding to red, yellow, green and blue, brings out particularly well some of the internal relations of order amongst colour.

There is no lack of insights concerning sameness and difference of direction on the colour solid that can without any hesitation be called apriori: that the connecting line from red and orange leads to yellow, that the line from red and violet leads to blue, but that these two lines do not by any means form a straight line (**gestreckter Winkel**, an attenuated angle; BFM 501)

Similarly, Moore reports that in 1930 Wittgenstein was claiming that the arrangement of the four primary saturated colours in a square is superior to their arrangement in a circle since it brings out more clearly the "logical" distinction between those saturated colours that are and those that are not primary (Moore 1959, 317-8). This point is developed in a subtle way in the **Philosophical Remarks** and in other records of Wittgenstein's lectures at the beginning of the thirties.

The difference between the square and the circle is the difference between the central cross-section of one of the different versions of the octahedron developed by Höfler and Ebbinghaus, on the one hand, and the equator of Runge's globe (**Farbenkugel**), on the other hand. As Höfler had pointed out, the disadvantage of the latter is that it represents the relative distances between colours in an arbitrary and very probably incorrect fashion. Whereas the square arrangement brings out "certain other inner relations (**innere Beziehungen**)", in particular the relations of opposition (Höfler 1897 §24)¹².

¹⁰ "Farbenkörper". Cf. "Beweiskörper, Bedeutungskörper".

¹¹ Cf. Husserl 1964 §16

¹² The primitive octahedron first developed by Höfler in 1897 does not bring out the way in which yellow is lighter than blue. But this is brought out in variations on the original octahedron by Höfler and Ebbinghaus, to which Meinong refers. In these irregular octahedra the distance from white to blue is about four times as great as that from white to yellow (Höfler 1911; RC I §2, III §132). As Höfler points out, the view that it is an inner feature of blue that it is dark, of yellow that it is light etc. goes back to Schopenhauer.

The square arrangement rather than the circular arrangement brings out the difference between two sorts of betweenness. The first type of betweenness is illustrated by

Any purple is between pure red and pure blue
Any orange is between pure yellow and pure red

the second type by

Any pure red is between orange and purple

That there is a difference here, Wittgenstein says, can be expressed by saying that "whereas an orange can properly be called a 'mixture' of yellow and red, red cannot properly be called a 'mixture' of orange and purple. The square arrangement, we may suppose, is superior to the circular arrangement because on the square, as opposed to the circle, there are privileged points that correspond to the privileged position of the primary saturated colours. The square arrangement allows us to see what we might call the *juste milieu*.

As Wittgenstein points out we might choose mixed colours at random and stipulate that they include an angle of 90°. But this would be completely arbitrary, "here the metaphor of an angle collapses" (PB §221)

We say a colour can't be between green-yellow and blue-red in the same sense as between red and yellow, but we can only say this because in the latter case we can distinguish the angle of 90°; because we can **see** yellow and red **as** (my emphasis) **points** (PR §221)

...we cannot say that red has an orange tinge in the same sense as orange has a reddish tinge. That is to say, it seems to be clear that the phrases "x is composed of (is a mixture of) y and z" and "x is the common component of y and z" are not interchangeable here: Were they so, the relation **between** would be all we needed for a representation (PR §222)

§4 Visual Space and Colour Space

The central difference between the two Austrian accounts of colour space is that Meinong, unlike Wittgenstein, takes seriously the notion of space that is appealed to in talking of tone space, colour space etc. This leads him to give a much more thorough - but also more ambitious - analysis of such concepts as **simple** and **complex**, **mixture**, **incompatibility** than Wittgenstein. Where Wittgenstein arrives at conclusions that resemble those of Meinong he, unlike Meinong, thinks that he is pointing out features of the (at least partly) conventional application of coordinate systems.

If we take seriously the claim that colours are in colour space and the claim that a colour line or a colour surface do not do justice to the colours then we may say with Meinong that the colour octahedron is a colour body or solid (**Farbenkörper**, BFM §2) **in** colour space, an at least three dimensional entity whose job is to "include empirical colour data before all theory" (BFM 534). "The colour body is in colour space and participates in its properties" (BFM 534). Now Meinong's analysis of colour space involves two features that

are controversial. First, it is designed to fit the Hering four colour theory. Meinong recognises that this might be thought to conflict with the requirement that description ("phenomenology") be theory free. Wittgenstein, too, seems to assume that the four-colour account of Hering is superior to the different three-colour accounts. Secondly, it involves an unusual account of the nature of the dimensions of colour space. This revision of the traditional view of the dimensions in which colours can vary was held to be unpalatable even by Meinong's own pupils, Höfler and Witasek. Nevertheless, as we shall see, in spite of the controversial details of its application to colour space, Meinong's general analysis really does provide some of the basic features of any approach that takes "spaces" (ontologically) seriously.

I shall describe first, the central claim of Meinong's analysis; second, the main problem on which the analysis is designed to shed some light; third, the application of the main claim to the relatively uncontroversial case of the space of visual orientation; fourth, Meinong's unusual view of just what the dimensions of colour space are and his arguments for this view; finally, the application of the main claim to colour space.

Meinong's central **claim** is a perfectly general point concerning manifolds and objects, simple and complex. The members of an n-dimensional manifold cannot possibly be simple. "If an A and a B can vary in the same two dimensions then this involves the possibility that A and B will be found to be the same in one respect and not in another: two simple objects cannot possibly be simultaneously different from one another and the same. There are as many components as there are dimensions..." (BFM 515; cf. EP 343). If colours are in a three dimensional colour space then we may call the three components of every colour "colour elements" (**Farbenelemente**). In precisely the same way, Meinong points out, we can introduce the concept of "spatial elements" (**Raumelemente**) in our analysis of visual space with its three dimensions, above- below, left-right and in front-behind (cf. PR §206).

The **problem** on which this claim is supposed to shed some light is the problem of incompatibility: just as an account of colour elements is going to help us understand the impossibility of sensing red and blue at the same place and at the same time so too the account of spatial elements is going to help us understand the parallel impossibility of seeing one and the same object at the same moment as directly in front and to the right.

Incompatibility amongst colours is the starting point for the discussions of colour by both Meinong and Wittgenstein¹³, it is a relation both take to be an example of an internal relation:

One's first thought is that it is incompatible for two colours to be in **one** place at the same time. The next is that two colours in **one** place simply combine to make another. But third comes the objection: how about the complementary colours ? What do red and green make ? Black perhaps ? But do I then see green in the black colour ?- But even apart from that: how about the mixed colours, e.g. mixtures of red and blue ? (PR §76)

Meinong's thoughts, he tells us, had followed a similar sequence. Before 1903 he had defended the view that "it is as impossible to see at the same position and at the same time red and blue, or even to imagine them, as is a round square" and "that no analysis is capable of

finding pure red and pure blue in violet" for "in violet one does not have both red and blue but neither red nor blue, rather a third thing lying between red and blue". In his 1903 paper however he presents an analysis of colours that, he claims, brings out the hidden truth behind the claim that violet is a mixture containing red and blue. This analysis is presented not only for the case of colour properties but also for the case of orientation properties.

§4.1 Orientation Space: Corners

Let us therefore see how Meinong's analysis applies to orientation properties.

Suppose I stand in a square room with my back to one of the walls. Can one say

that the the corner of the room in front of me and to my right combines the place properties exhibited by a certain position on the wall in front of me and a position on the wall to my right ? If I put the question like this the incompatibility of the two properties becomes immediately evident..(BFM 517).

Meinong baptises the different spatial elements here "depth data", "breadth data" (not to be confused with length) and "height data". If we assume, in order to simplify, that all the positions in our example involve the same height datum then Meinong's description of our example runs as follows: **in front of me** means a certain depth, **t**, together with a certain breadth value, **b**; **to my right** means a certain breadth, **b'** and depth, **t'**. The right-hand corner in front of me is then characterised by **t** and **b'**, but not by either **b** and **t**, or **b'** and **t'**.

As Meinong notes, someone who finds it strange to characterise a position on the wall which is directly in front of the subject as having a breadth value, someone who finds it strange to say that what is neither to the left nor to the right has a position on the left-right dimension, is confusing the coordinate value zero with the absence of a certain property. Wittgenstein makes the same point in a passage on money-space and pain-space: "'I haven't got stomach-ache' may be compared to the proposition 'These apples cost nothing' . The point is that they don't cost any money, not that they don't cost any snow or any trouble. The zero is the zero point of **one** scale" (PR §82).

What is incompatible are the two **complexes**, (**b**, **t**) and (**b'**, **t'**), although their components, **t** and **b'** are compatible (BFM 518). Incompatibility as a relation between complexes does not preclude compatibility between the **components** of these complexes.

§4.2 The Dimensions of Colour Space

Before we look at how the analysis carries over to colour space Meinong's unusual account of the **dimensions** of colour space must be introduced. Nothing would seem to be more natural than to take the dimensions of colour space to be the three dimensions in which colours can vary: hue, saturation and brightness. This was certainly the view of Höfler, Witasek and Wittgenstein. But, objects Meinong, hue cannot be a dimension since "the changes in colour hue take place in two dimensions" and "there is no room in **one** dimension for a closed line". (Meinong never mentions the possibility that the privileged points which are the primary colours could be represented without employing cartesian coordinates (for example with polar coordinates). Saturation cannot be a dimension either since, if grey really belongs to the centre of the colour solid then saturation too will vary in two dimensions.

¹³ On the plausibility of colour incompatibility see Hardin 1988, 121f.

Brightness is, however, a dimension, but not merely a dimension of the colour solid but of colour space (BFM 508). Hence the bright-dark dimension does not coincide with the white-black line, although the latter is in this dimension. The white-black line is the "main representative of (proxy for)" the brightness dimension.

Meinong then argues from the point that Wittgenstein was also to make

no-one could see both orange and violet in pure red in the way in which it has so often been thought that red and blue can both be found in violet (BFM 512)

to the claim that red and green, on the one hand, and yellow and blue on the other hand, are the main representatives of the two other dimensions of colour space. Normally, Meinong suggests, the names "red", "green", "yellow" and "blue" designate such main representatives. Only in one type of case do they seem to be used to designate directly a dimension: when we refuse to call the grey point red although other points at the same distance as it is from the red corner are called red.

The **application** of the general analysis to colour space in order to give an account of **colour incompatibility** now turns out to be very simple. What we know as pure red and pure yellow are just as incompatible as the complexes **b t** and **b' t'** in the above example. But this red and this yellow cannot be simple because of their positions in a three dimensional continuum

and if, in the interests of greater simplicity, we disregard the colour elements required by the light-dark dimension there remains in each of these colours a red-green element, **r** or **r'**, and a yellow-blue element, **b** or **b'**....Of course **r** and **b'** are compatible with one another (BFM 518)

What, then, on this analysis is a so called mixed colour? A psychological colour mixture is **not** the coming together of pure red and pure yellow; orange, for example, involves only the two elements **r** and **b'**. "The ordinary point of view, which overlooks the elements **b** and **r'** in pure red and yellow will not hesitate to take the elements **r** and **b'** to be pure red and pure yellow" (BFM 518). Instead of talking of (psychological) colour mixtures it is always better to use the relation already mentioned of betweenness: "in violet one does not have both red and blue, but neither red nor blue, rather a third thing lying between red and blue" (BFM 514); "a mixed colour, or better, a colour intermediate between blue and red" (PR §80).

Meinong's account of what the dimensions of colour space are denies to saturation the rôle of a dimension but it does allow him to analyse saturation. The "neutrality values" of the red-green dimension and the blue-yellow dimension together yield grey, and when combined with the neutrality value of the brightness dimension, neutral grey. In the case of a pure colour such as red, which is characterised by an extreme value of the red-green dimension and the neutral value of the blue-yellow dimension, we have a tendency to refuse to recognize the presence of the neutral element in spite of its "distinguishing function". Extreme components seem to have a greater significance than neutral or nearly neutral values; they seem to be more "intellectually accessible". This, Meinong suggests, is what the concept of saturation describes (BFM 519).

On Meinong's account we can see why, as Wittgenstein was to put it, "a colour intermediate between blue and red is such in virtue of an internal relation to the structures of

blue and red" and why "this internal relation is **elementary**. That is, it doesn't consist in the proposition 'a is blue-red' representing a logical product of 'a is blue' and 'a is red'" (PR §80). Every colour in colour space is characterised by a structure consisting of three values of the three dimensions of colour space - whichever view of these dimensions is adopted. Such a structure is a complex consisting of three such values or elements and between all such elements there obtain internal relations of three-way reciprocal generic dependence: every colour element requires two other elements from the other two dimensions. Every colour is specifically dependent on its constitutive elements, as a complex of such elements is specifically dependent on the colour they constitute. Between elements from the same dimension there are internal relations of order and distance and similarity. Incompatibility is another formal relation but a relation that holds between complexes. In other words, there are more ways for elements to hang together than are dreamt of in the **Tractatus**¹⁴.

In the **Tractatus** Wittgenstein had characterised the dependence of an internal relation on its terms in terms of what is and is not thinkable: the internal relation darker/lighter than between two blue colours is such that it is unthinkable that these two objects do not stand in this relation (4.123). But as Meinong (and Husserl) point out, that something cannot be thought of without something else must be distinguished from something's not being able to exist without something else (BFM 505). And this distinction is important for Meinong because of his distinction between the colours we actually see and possible colours (see §2 above).

§4.3 The Nature of Elements

Meinong points out that in the absence of a precise account of the nature of those constituents which are colour elements and of the way they combine there is an unfortunate tendency to rely unconsciously on the analogy of material parts (BFM 520). But one interesting clarification of the nature of Meinong's elements does follow from what he says. The elements of the space of orientation must, it seems, be properties, such as sinistrality, centrality, or representatives of properties. The two cases of the spaces of colour and of visual forms are much more difficult, as we have seen. But a distinction often used by Meinong and other pupils of Brentano is useful, and one half of this distinction is actually criticized by Wittgenstein. The distinction is that between the ideal objects **Red** and **The Triangle** on the one hand, and their instantiations on the other hand. The instantiations of Red etc. are the dependent particulars already alluded to as the only temporal entities between which internal relations can obtain, often called **moments** by the Brentanians ("qualities" and "tropes" by others). Of such moments the Brentanians often liked to say that they were "abstract parts" of objects. (The term "qualities" has often been reserved for what is, like Aristotelian accidents, "in" an object or a subject without being a material part of the object). Similarly, the instantiations of geometrical forms were thought of as dependent particulars, two and three dimensional **Ausdehnungen** or extents. **Instantiation** as a relation between ideal objects and dependent particulars is to be sharply distinguished from **exemplification**,

¹⁴ In his discussion of perceptual spaces Hardin writes: "'So the relations that the colors bear to one another are neither more nor less puzzling than the relations borne to each other by a set of vectors extending from a common origin in a space with four preferred directions'" (Hardin 1988, 116). On the ontology of vectors, see Höfler 1900, Johansson 1989, 103f., 165f.

the relation between an ideal property and particulars and the case where an ideal form is instantiated by a concrete, independent form¹⁵.

Wittgenstein criticizes the idea that a "red circle **consists of** redness and circularity or is a complex of these components" as a misuse of these words and misleading. (Frege knew this and told me so)", in the appendix to **PR** on "Complex and Fact" and later.

Nevertheless moments or "abstract parts" have at least three important roles in the accounts of perception of Husserl and the early Meinong, rôles that perhaps only they can perform. First, together with the independent particulars which are instantiations of ideal forms they are, on these accounts, what we see. Thus moments allow us to defend the thesis that what we see is always particulars, independent and dependent, relational and monadic. And, secondly, they are what we often designate with the help of such singular terms as "the redness of that cheek". Finally, the internal relation of interdependence between those perceptual objects which are colour moments and their associated extents allows us to distinguish between the **complexity** of a colour moment (its constituent colour elements) and its **uniformity** - the fact that a particular extent is uniformly red¹⁶.

§5 Developments and Applications

The descriptions given by Meinong and Wittgenstein of the internal relations which, together with external relations such as contiguity and succession, structure what we see represent a point of view which has become relatively uncommon. At the opposite theoretical extreme is the point of view developed by Russell's pupil Jean Nicod in his wonderful **La Géométrie dans le monde sensible** (1924) which provides a taxonomy of sensory relations all of which are understood as external relations. It still remains to be seen which of these two accounts is the most adequate. Here I shall limit myself to pointing out three developments and applications of the Austrian view of colours and corners which any such evaluation would have to take into account.

§5.1 Tractarian Complexity

As Meinong's distinction above between simple and complex objects indicates, the discussions of colour by Meinong and Wittgenstein may well throw light on some of the concepts employed in the **Tractatus**: independence and dependence; simple and complex; and formal relations, since all internal relations are formal¹⁷. Wittgenstein's discussion of colours in **PR** is indeed presented as pointing towards a fundamental modification of some Tractarian doctrines:

In my old conception of an elementary proposition there was no determination of the value of a co-ordinate; although my remark that a coloured body is in a colour-space, etc., could have led me straight to this (PR §83)

¹⁵ Instantiation and exemplification must also be distinguished from the determinable-determinate and genus-species relations, internal relations the Brentanians liked to subsume under the rubric "logical parthood".

¹⁶ Cf. Husserl's LI III §8, Westphal 1977.

¹⁷ On formal concepts in the **Tractatus** and the **Logical Investigations**, see Mulligan 1991a

On the Husserlian and Meinongian accounts of the manifold of propositional form, of the manifold of the form of states of affairs and of the manifold that embraces these the **Tractatus** represents a deviant version of manifold theory. Deviant, because Wittgenstein insists only on independent variability within the different dimensions distinguished and provides almost no account of the interdependence between dimensions, a gap that is partially remedied in the **Philosophical Remarks**.

Wittgenstein's distinctions between internal and external relations are rarely discussed. Russell's view that either all relations are external or all relations are internal is perhaps responsible for this. Once we accept that both sorts of relation exist the question of the correct taxonomy of internal relations arises. Here one important distinction is the following. One sort of internal relation is a relation which is such that it must exist if its two or more terms exist, where these are mutually independent. A quite distinct sort of internal relation is the case where the terms are not mutually independent. An example of the latter would be the relation between an accident such as Sam's sadness and its bearer, Sam. If the sadness in question exists and if Sam exists then there is a relation of dependence between them. An example of the first case would be the couple consisting of a judgement and an obtaining state of affairs; each is independent of the other, but where we have both then we have a relation of structural similarity between them. These examples suggest that internal relations are always formal relations.

§5.2 The Variety of Colours

The colour octahedron tells us a great deal about the phenomenology of colours, but by no means everything. It tells us nothing about the role of illumination. And hence nothing about the colours we encounter most frequently. After **PR** Wittgenstein seems to have discovered the variety of colours. Within descriptive psychology the different types of colour not represented by the colour solid had been described and analysed by David Katz in his classical 1911 monograph Die Erscheinungsweisen der Farben. As Katz puts it, colour space has traditionally been conceived as dealing with **Flächenfarben** or film colours; but none of the stereometric constructions of colour solids can be considered to be a conformal mapping (konforme Abbildung) of all the **Oberflächenfarben** or surface colours (Katz 1911, 35). It is via **Oberflächenfarben** that we get information about the external world (Katz 1911, 266). A full description of colours must start from this distinction and describe such phenomena as space colours (eg the colour of fog), the colour of stuffs as well as the phenomena of transparency, lustre and reflections.

Wittgenstein had already accepted in **PR** two claims (characteristic of the descriptive psychologists) without which it is impossible to describe these varieties of colour. First, the claim that what is seen is coloured and spatial (PR §205ff.) It is probably to this claim that he is alluding when he says that colours may have, in addition to saturation, hue and intensity of light a fourth dimension¹⁸ (PR §66). Second, the further specification of this claim: that we see depth (PR §208). But the descriptions of the variety of colour in **Remarks on Colour**, which build on these two points, differ in one crucial respect from those of Katz. Wittgenstein's moral is, from the theoretical point of view, negative: not all colour concepts are of the same kind, the concept of sameness of colour is indeterminate etc. Katz, on the other hand, is concerned to set out the relations between the different systems of colour.

¹⁸ Cf. Z §269; Höfler 1930 §24 defends this view against Helmholtz.

§5.3 Internal Relations and the Analysis of Perception

Finally, perhaps the most important job performed by the view documented above is within a certain theory of perception, a theory developed by the heirs of Brentano, above all by Husserl in **Ding und Raum** - which describes the internal relations within kinesthetic space and orientation space - and by Paul Linke. It contains two major claims, each of which is anti-Kantian. It therefore differs considerably from analyses of perception that stem from Kant such as those of Helmholtz, Poincaré.

The first component in this Austrian view of perception is the thesis that to see is not to judge and hence involves no exercise of concepts. This view was defended by Husserl and by Meinong's pupil Benussi and has recently been forcefully defended by Dretske¹⁹. Meinong himself never relinquished the thesis of his teacher Brentano for whom to see is to judge, but since Meinong thought that perceptual judgements worked with intuitive presentations rather than non-intuitive presentations, concepts, his view is after all closer to Husserl's than that of Kant. Since first person perceptual reports are founded on perceptual judgements (when they are not **Ausserungen** of perceptions) this view claims that such judgements differ fundamentally from their perceptual bases. Of course, this claim is quite compatible with its being the case that what is seen depends functionally or in other ways on the concepts a subject has mastered (on the bases of his dispositions to employ different concepts).

The second component of this Austrian view is the already mentioned claim that a spatial element, in the simplest case a visual point or extension, but normally a three dimensional body, always belongs to what is seen.

This Austrian view must of course, like any analysis of perception, account for what might be called our ability to identify and discriminate items within the scenes we are visually presented with. In order to do this it cannot appeal to the employment of concepts, as can the friend of the Kantian approach. The view that the colours, forms and orientation properties we are presented with are highly structured in virtue of the internal relations holding between the different features within a visual field does just this job. Just **how** it does this job will depend on the the answers given to the questions with which we started. Thus the coloured forms we see may be held to be private phenomenal entities standing in one or more relations to public things: belonging to, caused by, manifestation of etc. Or they may be held to be public entities that stand in one or another part-whole relation (three-dimensional part, abstract part) to other public things. Or they may be held to be public entities that are identical, at a time, with people and tables²⁰. Let us see how the Austrian view works on the assumption that the latter view is the correct one (translations into the language of the other views are easily effected).

On the Austrian view the perceptual subject tracks, stands in perfectly extensional relations to, coloured forms that are static and dynamic, relational and non-relational. What perceptually individuates all such items are the external and internal relations they stand in,

¹⁹ Husserl, RL VI §§1-3; on Benussi see Stucchi 1991; Dretske 1969.

²⁰ This seems to be the correct view. It may even have been Aristotle's view: "those sense-objects are called incidental that are like the white thing's being the son of Daries. For this we perceive incidentally, for it is incidental to the white thing we perceive" (de Anima, II 6). On this view, see Mulligan 1991.

not the concepts under which they fall. Now it is a striking characteristic of the perceptual reports that are based on - but not, on this view, identical with - perception that their primary use is to describe external relations amongst things:

- (1) Sam sees Maria
- (2) Sam sees Maria hit Hans
- (3) Sam sees Maria hitting Hans
- (4) Sam sees Maria fall over the stone

What makes such descriptions of external relations true is Sam's standing in perceptual relations to coloured forms and the relations, internal and external, amongst these and their parts. Perceptual reports **may** of course describe internal relations

- (5) Sam sees this ice patch as darker than that patch

may be made true by Sam noting an internal relation between two colours.

Wittgenstein describes the difference between the two interpretations of (5) in the **Last Writings on the Philosophy of Psychology**:

"I see that both of them are similar" can be used temporally and atemporally, depending on how "both of them" are defined "I see" is always temporal, but "both of them are similar" can be atemporal (LWPP §152)

"But do I therefore see something different in each case ?", Wittgenstein asks. On the Austrian view, the answer to this is: no, although there are differences in attention between the two cases. Not only the truth maker of (5) but also the truth makers of (1)-(4) involve perceptual relations between Sam, on the one hand, and internal relations between coloured forms on the other hand. Even in the case of (1) Sam is in perceptual contact with a complex whole and with internal relations between its parts. He sees Maria's arm as belonging to the shape that is at that moment Maria.

Wittgenstein pursues the difference between reports that are and are not explicitly about internal relations as follows:

"There is similarity between these two cases"....could mean: there is a similarity between **this** type of face and **this** type of face....It may be the faces of **these people** that interest me, or these facial **forms**, wherever I come across them.

The difference I have in mind is of course that between the sense: These two lines have a similar form - and the sense: the circle, ellipse, parabola and hyperbola resemble one another (§155)

The difference is that between "internal and external similarity". In the former case the relation is between geometrical types (§156, §158). (As we saw above, in PR grammar deals with types.)

Internal relations strike the subject, come to his attention, in the phenomenon of sudden seeing as ("Aha-experiences")²¹. For in such unusual experiences the subject is struck

²¹ Cf. Chisholm 1989, Mulligan 1988.

by internal relations that are normally not thematic, not the object of his attention: he notes one coloured form as fitting or going with a second coloured form. But for Husserl and Meinong, Benussi, Linke and other Gestalt psychologists - but probably not for Wittgenstein - such surprises merely throw into relief the internal relations which always structure what we see. That the parts of the coloured array that is Maria belong together is a presupposition of ordinary "continuous seeing". This point is brought out by a type of perceptual report introduced by the descriptive psychologists:

- (6) Sam sees A as a part of B/as fitting or going with B/
as brighter than B...

where these relations are internal relations²². The truth makers of such reports, which employ only colour and form expressions, make true both reports of simple perception (cf. (1)), naked infinitives describing events and processes ((2), (4)), reports of perception of states ("Sam sees this animal as a duck" - not to be confused with the absurd "Sam sees this duck as a duck" - and "Sam sees Maria's sadness) as well as descriptions of the experience of aspect change²³. Just how awareness of internal relations - which by itself tells us nothing about the world as long as the terms of the relation are taken to be ideal entities - combines with sensory input in perception is the problem addressed by Paul Linke (1918) in one of the last developments of the descriptive psychology of perception.

One of the many possible objections to the claim that perceptual reports typically describe external relations whereas perception always involves awareness of internal relations is that perceptual reports, indeed all descriptions, also involve awareness of or mastery of internal relations, albeit conceptual ones. By way of reply it should be noted, first, that the claim that there are internal relations between concepts or ways of using words is a very different claim from the claim that colours etc stand in internal relations. The classical arguments against conceptual necessity do not apply obviously to the claim that there are internal relations amongst colours or tones. That our conceptual discriminations are conventional would not entail that the same is true of our perceptual discriminations unless it is shown that colours are linguistic entities. And with respect to Wittgenstein's apparent

²² All the differences already mentioned about the nature, formal and material, of the terms of such relations and their scope crop up in the writings of the Gestalt philosopher-psychologists. Is a Gestalt such as a melody an ideal property (Ehrenfels, Meinong, Benussi), a dependent particular (Husserl, Stout), an individual (Köhler)? Are the parts of a Gestalt independent of it (Meinong, Stumpf) or inseparable from it (Köhler), that is, are perceptual relations exclusively internal? Discussions of the latter question suffered from the fact that all the participants, except Husserl, were critical realists, holding that Gestalten and their parts were first and foremost phenomenal entities. Once this phenomenalist assumption is discarded the way is open to claim (a) that the theory of relations of Meinong and Stumpf was a good one - relations ultimately presuppose independent terms - but these independent terms are not simple phenomenal items, for there are none such; and (b) that there are internal relations amongst the parts of the coloured arrays we see, but that these arrays and their parts are not phenomenal items or ideal entities but rather moments and things belonging to the same category as "this square".

²³ "Seeing as", whether used to describe sudden aspect switches or not, takes as a complement a small-clause and resembles for this reason naked infinitives, which are used to describe events and processes rather than states.

adoption of this view (see above), a view quite clearly not shared either by his Austrian predecessors, nor by many of the more interesting recent writers on perception (Harrison, Hardin, Westphal) Moore's astonishment is surely justified:

According to what he said elsewhere, he could only have been talking sense if he was talking, not about the colours, but about certain words used to express them; and accordingly he did actually go on to say that "red is primary" is only a proposition about the use of the English word 'red', which, as I said....he cannot seriously have meant (318)

Secondly, as the friends of semantic spaces are the first to point out, the number of dimensions of semantic spaces exceeds by far the number of dimensions in the different sensory spaces. Thirdly, it seems much more likely that a large part of our ability to recognize sensory facts is innate than does a similar claim with respect to our mastery of different semantic fields.

Although the Austrian analysis of perception goes well beyond what Wittgenstein says about perception the following formulation of Wittgenstein's neatly captures part of the strong Austrian view:

I should like to say, if there were only an external connection no connection could be described at all, since we only describe the external connection by means of the internal one. If this is lacking we lose the footing we need for describing anything at all - just as we can't shift anything with our hands unless our feet are planted firmly (PR §26)

Perhaps all that Wittgenstein had in mind here is that a description and the state of affairs (external relation) it describes must stand in an internal relation to one another. On the Austrian account it is important to add that when we perceptually verify this description we see objects standing in both internal and external relations. We see external relations with the help of internal relations.

* Thanks for many comments to Roberto Casati, from whom little about colours is hidden.

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