

Varieties of Visual Representation

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Pictorial representation is one species of visual representation--but not the only one, I argue. There are three additional varieties or species of visual representation--namely 'structural', 'aspect' and 'integrative' representation--which together comprise a category of '*delineative*' rather than depictive visual representation. I arrive at this result via consideration of previously neglected orientational factors that serve to distinguish the two categories. I conclude by arguing that pictures (unlike 'delineations') are not physical objects, and that their multiplicity and modal narrowness motivates a view of them as instead being (one kind of) 'delineatively' represented *content* or *subject matter*, as represented by those objects that are (commonly but wrongly, in my view) assumed to be pictures.

By a 'visual representation' I mean roughly an item that is both visible itself, and which purports to represent some actual subject (that in paradigm cases is also visible), in such a way that the representing item is in some way similar to, or recognizable as, the purported actual subject; and which item has a representational *content* or *subject matter* that may or may not accurately characterize any actual subject.¹ *Pictorial* representation is one species of visual representation.²

However, one of my main concerns in this paper will be to argue that there are no less than three additional varieties or species of visual representation, none of which are currently adequately recognized, and which together comprise a category of visual representation distinct from that of pictorial representation.

Thus I shall be discussing two main categories of visual representation. The first category is the familiar kind, comprising the category of paintings, drawings, photographs, and other pictures that visually depict things. I shall refer to this category as that of *pictures* (or *depictions*), which pictures or depictions function by *depicting* some subject or subject matter.

The second category of visual representation, however, seems to be (as noted) a currently unfamiliar and undefined one--at least in conceptual terms. Thus some discussion is required prior to any succinct characterization of it. I shall refer to this category by means of the (correspondingly unused) term *delineation*, which 'delineations' function by *delineating* some subject or subject matter.

Delineations come in three different varieties, to be called *structural*, *aspect* and *integrative* delineations (for reasons that will become clear), so that overall, when pictures also are considered, there are four distinct varieties of visual representation.

It will turn out that a primary difference between pictures and the three kinds of delineations is a difference in *orientational* characteristics of each.³ Thus I shall begin by discussing spatial orientational factors, as a necessary preamble to the introduction of the category of delineations.

I Pictures and Orientation

Two complementary spatial orientation concepts may be defined--of *intrinsic* and *field* orientation⁴--both of which concern the orientation of an object (such as a picture) that is perpendicular to a horizontal axis through its center, which axis is the normal viewing line of sight for the picture in question.⁵ Relative to such an axis, the picture may be rotated through 360 degrees; for rectangular pictures, there are four salient positions, in which the work is (perceived as) respectively upright, on its right side (turned 90 degrees clockwise from the upright position), upside-down or inverted, and on its left side.

However, further analysis is required in order to capture the full meaning of a term such as 'upright'. Intuitively, there are two necessary conditions for something to be 'upright'. First, it must have a *top* or *top side*, which is identifiable as such, no matter how the object may be rotated or currently oriented; I shall describe such an object as having an *intrinsic orientation*, and its top as being an *intrinsic top*. And second, such an intrinsically oriented object must currently be oriented so that its intrinsic top is *aligned with* the top of the natural environment, or environmental field, in which it is located.

The concept of alignment can be generalized to apply to *whichever* side of an object is aligned with the top of the environmental field--whether or not the object has an intrinsic orientation. I shall describe such an alignment as constituting the *field orientation* of an

object. Thus any rotation of an object changes its *field orientation*; whereas on the other hand, if an object has an *intrinsic orientation*, then it possesses an intrinsic or inherent top (no matter what field orientation the object currently may have, or be rotated to).⁶

Now I shall discuss the relevance of intrinsic orientation to pictures. To begin with, pictures standardly have a well-defined *upright* orientation, in which the picture is normally displayed, and which they possess for various reasons such as the intentions of the artist, photographer and so on, or because of various cultural norms, such as that if a person is painted in a standing posture, then the side of the artwork nearest to her head is to be displayed so that it is visually higher than the other sides.

Also, as will be clear from the initial definitions in this Section, an object cannot *have* such an upright position unless it also has an *intrinsic* orientation, in that an 'upright' orientation of an artwork *just is* that field orientation in which the intrinsic top of the artwork is aligned with the field top. So for pictures in general it may be taken for granted that they have an intrinsic orientation, and that they are normally intended to be seen or shown in their upright orientation.⁷

However, it seems not to have been noticed that the intrinsic orientation of a representational picture also confers on it an additional property, namely that the *field orientation* of its *subject matter* may be *determined from* that intrinsic orientation of the picture⁸--no matter what the field orientation of the picture may be--in the following

manner. Since the derivation is to be carried out in several stages, I shall state and illustrate the result to be arrived at before deriving it.

The result I shall arrive at is that the *oriented subject matter* of a picture remains *invariant* through rotation; or in other words, that the field orientation of its subject matter does not change even if the field orientation of its picture does change. I shall call this principle the *oriented subject matter invariance* or *OSMI* principle. For example, if an (upright) picture of an upright building is inverted (i.e., rotated to an upside down position), then what results is an *inverted* picture of an *upright* building (rather than an inverted picture of an *inverted* building).

Here then is the derivation. First, the subject matter of a picture always has some particular field orientation of its own, as in the case of a picture of an *upright building*.⁹

Second, the question must be asked of how we *know* that the subject matter of such a picture is indeed that of an *upright* building, rather than of a building in some other field orientation. An initial answer might go as follows: we know it is upright, because when the picture itself is viewed in its own natural upright orientation, the depicted building can be *seen to be* upright. Or in other words, we determine the field orientation of the subject matter by 'normalizing' the field orientation of the picture itself to its upright position--in which its field top is aligned with its intrinsic top--and then we take the field top of the *subject matter* to have the *same* field orientation as do both the intrinsic top and current field top of the *picture*.

However, this initial result does not yet enable us to claim that the field top of the subject matter is always aligned with the *intrinsic* top of the picture. For there is at least an abstract possibility that the field orientation of the subject matter might itself co-vary with the *field* orientation of the picture when the picture is rotated, rather than remaining fixed as does the intrinsic top of the picture. But this possibility will now be ruled out.

Third, the field orientation of a picture A's subject matter is surely one of the *necessary characteristics* of picture A, in the sense that any picture B, whose own subject matter had a different orientation from that of picture A, for that reason could not be identical with picture A. Example: just as a picture of a *person* could not be identical with a picture of a *cat*, because each picture has a different subject matter, so is it equally clear that a picture of an *upright* or standing person could not be identical with a picture of a *horizontal* or reclining person, because each picture has a differently (field) *oriented* subject matter. Thus having a given *field orientation* for its subject is just as much necessary to the identity of a picture as is its having a certain *kind* of subject matter.

However, since this is so, it follows that the field orientation of the subject matter of a picture cannot itself change as the picture is rotated, on pain of the picture itself losing its identity during this process. Or in other words, just as the particular *kind* of subject matter that a picture has must remain invariant during its rotation, so also must the specific *field orientation* of the subject remain invariant during any such rotation--and

hence, as announced, the *oriented subject matter invariance* or *OSMI* principle holds for pictures.¹⁰

Given this account, the characteristic kind of representation associated with pictures could appropriately be called *intrinsic* representation, in that the field orientation it represents its subject matter as having depends solely on the 'alignment status' of that subject matter--as upright, inverted, and so on--with respect to the *intrinsic top* of the picture. Thus, pictorial or intrinsic representation is on this view *independent* of whatever actual field orientation a picture might happen to have--which view also exactly fits the very common intuition that both a picture, and what it represents, cannot be changed merely by changing the field orientation of a picture.

Thus I would claim that my concept of pictorial or intrinsic representation captures at least a large central core of cases that have traditionally been regarded as being pictures. Nevertheless, the concept is still flexible enough to allow for the possibility of other cases of visual representation that do *not* conform to its oriented subject matter invariance (OSMI) principle, and which hence require additional visual representation concepts for their adequate description, such as the three new 'delineative' concepts that I shall introduce.

II Pictorial Versus Delineative Representation

In this Section I shall briefly draw out an important implication of the above account of pictures, that will also serve to make it intuitively clear why *pictorial* representation cannot be the only kind of visual representation. The implication to be discussed is that pictures must be distinct from the physical objects that are their vehicles, because it is possible for *more than one* picture to be associated with a given physical vehicle, so that such objects are (at least potentially) pictorially *ambiguous*.

Consider a rectangular physical painting A, whose subject matter is a car, with the roof of the car being closest to its field top W, and its wheels closest to the bottom, opposite side Y of the painting. Most likely the artist had intended to depict the car in its own upright orientation, so that side W of the painting would be the intrinsic top of the picture. Call this picture--that has side W as its intrinsic top--picture P1. Thus if picture P1 (and hence painting A) is rotated to an inverted position, with side Y at the top and side W at the bottom, what results is an *inverted* picture P1 of an *upright* car, because of the previously-discussed OSMI principle for pictures.

However, artists are of course free to depict cars (or any other objects) in any field orientation that they please, and to change their minds about such matters at any time prior to exhibiting the resulting picture. Suppose that the artist in question, after inverting picture P1 (and hence painting A) in the manner just discussed, decided to *reinterpret* her physical painting A as a picture, not of an *upright* car as with picture P1, but instead as a picture of an *inverted* car.

In so doing, she would be deciding that side Y (and not side W) would be the intrinsic top of the resulting picture. But then that resulting picture P2 must be a picture *distinct* from the original picture P1, because each picture has a distinct intrinsic top, with side Y for picture P2 and side W for picture P1. Also of course each picture has a different oriented subject matter, with picture P1 showing an upright car, while instead picture P2 shows an inverted car.

Thus in sum, a pictorial *ambiguity* results: the inverted physical painting A, with side Y as its field top, could be interpreted either as an *inverted* picture of an *upright* car (picture P1), or as an *upright* picture of an *inverted* car (picture P2). And also neither picture, strictly speaking, can be identical with the physical painting A, given that P1 and P2 are distinct from each other.¹¹

Now both pictures P1 and P2 are subject to the OSMI principle, since as usual field rotations of either picture would not affect their intrinsic orientations, relative to which the field orientation of their respective subject matters is defined. Also, P1 and P2 are distinguishable from each other, and hence from A, because they obey the OSMI principle.

However, what about the distinct, physical painting A itself? Since it is distinct from both pictures P1 and P2, surely there must be some legitimate sense, or senses, in which *that physical painting itself* represents a car, independently of the specifically *pictorial* way in which P1 and P2 represent a car. For in seeing the physical painting, one can see

car-related subject matter even if one does *not*--as we normally do--proceed to interpret what one is seeing as a picture having a certain intrinsic top.

My claim is that here is where the possibility of *non-pictorial* or *delineative* forms of representation becomes operative. If one regards the painting A simply as *a rectangular physical object*, which represents an upright car when side W is A's field top, then when A is inverted--so that side Y becomes its field top--it will be seen as representing an *inverted* car. Thus the representational capacities of *the painting A itself* do *not* obey the OSMI principle--which is just what one would expect, since conformity to the OSMI principle is what distinguished pictures P1 and P2 from A in the first place.

Further, I shall argue, as previously mentioned, that there are in fact *three* different characteristic ways in which a physical object such as A could delineatively or non-pictorially represent some subject matter, which could briefly be summarized as follows:

- 1) *Structural* delineation: the object, in any field orientation, represents the subject matter *without* representing its field orientation.
- 2) *Aspect* delineation: the object, in a particular field orientation, represents the subject matter in the same particular field orientation.
- 3) *Integrative* delineation: an integrative concept covering all possible cases of aspect delineation for a given object. (Thus, if one wishes, aspect and integrative delineation could be regarded as related subspecies of a single kind of delineation).

One outcome of the discussion in this Section is that pictorial versus delineative kinds of representation are closely associated with different kinds of *uses* or *social functions* of objects such as paintings, maps, diagrams, and so on. We naturally refer to physical paintings and photographs as *pictures* because the predominant or most common *use* of such objects is in a pictorial way. However, as has just been illustrated, the relevant physical objects could also function in some delineative representational way as well.

On the other hand, other kinds of objects, such as maps or diagrams, instead predominantly function in *delineative* ways--see the next Section--even though they too may function pictorially in less common cases. (A further discussion of the contrasting representational uses of objects in general is provided in Section 9).

To conclude this section, here are brief replies to two possible objections to my account.¹² The first objection is that there are many objects that have *no* field orientation--such as planets, or city streets--but surely there can nevertheless be pictures of such objects, so that the OSMI principle would fail to apply to pictures of such subject matters. Answer: this objection confuses the *subject matter* of a picture, i.e. its visible representational content, with whatever actual objects or scenes might have *inspired* (in a painting) or *causally produced* (in a photograph) that representational content.¹³

The second objection is that there are pictures, such as Escher's well-known lithograph 'Relativity' (1953), which show a scene with parts that apparently each have *different* field orientations, so that the subject matter of the picture as a whole either has multiple

orientations or *no* field orientation--again, does not such a picture violate the OSMI principle?

My answer is in two parts. First, of course the subject matter of any picture may be composed of several parts or objects. For simplicity I have assumed that one may characterize the field orientation of a picture's subject matter as a single unit, but one could equally well describe it distributively, in terms of a geometric *orientation matrix*, in which each distinguishable part, object or area of the subject matter has its own individual field orientation description specified, relative to the intrinsic top of the relevant picture. Then my OSMI thesis would be that the relevant *matrix* of field orientations remains invariant through rotation of the picture.

On the other hand, the objector's concern might be more that some areas of the subject matter of the lithograph could equally well be assigned *differing* or *inconsistent* field orientations, because of the overall *ambiguity* of field orientation of Escher's lithograph taken as a whole. However, this kind of objection mainly serves to show the necessity of distinguishing individual pictures--each with its own distinctive intrinsic top--both from each other and from their physical vehicle, as discussed in this Section. Indeed, the overt ambiguities of Escher's 'Relativity', which positively require an account such as mine for their resolution, provide convincing evidence that the current approach, which finds potential ambiguities of pictorial interpretation in *any* physical pictorial vehicle, is fundamentally on the right track.

III Maps

Now I shall proceed to discuss delineations. To begin with, as already mentioned, the concept of a delineation is an unfamiliar one. Nevertheless, there are some familiar examples of the extension of this unfamiliar concept of a delineation, among which geographical *maps* and technical *diagrams* provide some prominent examples, as well as *trompe l'oeil* paintings.¹⁴ I shall start by discussing maps.

Dominic Lopes treats maps as a subclass of pictures, saying of them that they "...are clear examples of informative pictures".¹⁵ But Richard Wollheim is more wary of maps. In his view, a map is not a 'representation'¹⁶ because maps are (in his terms) excluded by virtue of the connection between representation and 'seeing-in'. It will be useful to quote his remarks:

"...the connection allows to exclude from representationality signs like maps that are not of whatever it is that they are of because we can see this in them. We may or may not be able to see in them what they are of but, if we can, it is not this fact that secures their meaning. A map of Holland is not of Holland for the reason that the land mass of Holland can be seen in it--even if to a modern traveller a map reminds him of what he can see, looking down upon the earth, at the flying altitude of a plane. No: what makes the map be of Holland is what we might summarily call a convention.

This fact about maps and what they map is confirmed by the way we extract from them such information as they contain. To do so we do not rely on a natural perceptual capacity, such as I hold seeing-in to be. We rely on a skill we learn. It is called, significantly, 'map-reading': 'map-*reading*'."¹⁷

Thus, according to Wollheim, a map is not (in my terms) a picture, for example because we do not see what a map is *of* when we look at it; instead, on his view, a map is rather a conventional sign, that needs to be read rather than seen.

However, I believe that Wollheim has not considered a sufficient variety of visual phenomena in his account. In particular, a map does show or visually represent (in my broader sense) various spatial relationships between places, in that one can *see* those relationships in looking at a map. Thus, even if a map has a higher degree of conventionality than most pictures, it would be wrong to deny that it does in *some* way visually represent geographical features. A map is much closer to a picture than it is to a conventional linguistic sentence, but Wollheim's summary dismissal of maps as conventional does not adequately explain this proximity.¹⁸

Nevertheless, I shall side with Wollheim in denying picturehood to maps, but for other reasons than his--reasons which will both explain why maps are not pictures, and why maps and pictures are nevertheless species of a common genus of *visual representation*, which genus is distinct from other more distant categories of representation such as that of linguistic representation.

IV Structural Representation

In order to explain what it is about maps that makes them non-pictorial in various ways, I shall, as previously announced, bring in the neglected concept of the *spatial orientation* of a visual representation. It will turn out that there are critical orientational differences between pictures on the one hand, and maps (or other 'delineations') on the other (as well as other significant differences).

As already implied, there are three possible non-pictorial or 'delineative' kinds of visual representations associated with maps, all of which make no use of the 'pictorial' concept of intrinsic orientation¹⁹ (relative to which, as explained in Section 1, a picture *intrinsically* represents its content or subject matter, in a manner that satisfies the *oriented subject matter invariance* or *OSMI* principle).

The first of these kinds I shall label as a *structural* delineation. In a *structural* delineative interpretation of a map, it is viewed or visually interpreted as giving *purely structural or relational visual information* about its subject matter, which information does not depend on any kind of *orientational* information (whether of a field or intrinsic kind, and whether pertaining to the map or to its subject matter).

It is important to distinguish relevant versus irrelevant kinds of orientational information. Obviously any map will include 'compass orientation' information (with one side being North-facing, the opposite side being South-facing, and so on), which provides, in effect, an *intrinsic* orientation for the map (with its North-facing side being its intrinsic top).²⁰ And, equally obviously, any particular viewing of the map (in a location within the terrain of which it is a map) will be a case in which the map has some particular field orientation relative to the surrounding terrain, of which it is a map.

But my claim is that a *structural* map interpretation makes no *use* of any such orientational information--that since it is purely *structural* (including broadly geometric) visual information that is seen to be represented, it would make no difference how the map itself might be field aligned with respect to an actual landscape, and nor would it make any difference whether or not the map had an intrinsic orientation.²¹ And what is more, the same points hold for the seen represented content too: it also is interpreted structurally, with no attention being paid to any intrinsic or field orientational factors.

This is a good point at which to bring in another example of a delineative representation, namely a *diagram* or blueprint. For example, a schematic diagram of a car engine under a typical interpretation does not *picture* or *depict* a car engine, but instead it merely *visually represents* its parts and their positions relative to each other, without depicting any particular orientation of the engine--and hence it (structurally) *delineates* rather than depicts the engine.

As evidence for the presence of such a structural interpretation of maps or diagrams as a normal (or at least common) case, consider Wollheim's own negative evaluation of maps as requiring *reading* rather than genuine visual interpretation. (There is also a natural sense in which one may have to learn to interpret or 'read' a car schematic diagram, or an architectural blueprint). I suggest that the so-called 'reading' in question is simply a consequence of the fact that extracting invariant, orientation-independent visual information from an object such as a map requires extra conceptual work, over and above that required simply to visually interpret it as an object, or as an object *depicting* something.²²

Or in other words, the so-called 'reading' is instead a further, more abstractive phase of (what is nevertheless) genuine *visual* processing of information from a map or diagram. The visual appearances of things naturally come in many specific situational (lighting, etc.) and orientational forms. Abstracting what visually is in common or invariant among many such particular appearances is not necessarily easy or automatic as is the seeing of such aspects themselves. Yet what is thus abstracted is still genuinely visual information, so that, for instance, one who has learned how to do this for a given map or diagram can actually *see* that same invariant visual information in the map or diagram before her, no matter what particular orientational conditions may prevail.²³

And finally in this section, another, more *a priori* kind of argument for the existence of structural delineative visual processing²⁴ is that, since *structural* visual information about

a represented object is a legitimate and knowable category of visual information about the object (having cognitive value complementary to that of pictorial representations of it), then there has to be some empirical way in which such information can actually be collected through our visual perceptual mechanisms--hence there must *be* actual mechanisms of structural delineative visual processing, which involve concepts that suffice to define a class of objects as the contents of structural delineations.

V Aspect Representation

In the previous Section one particular variety of delineation (namely, a *structural* delineation) was defined, and distinguished from a picture. Now I shall introduce another variety of delineation, to be called *aspect* delineation. It will be helpful again to go back to first principles, as in the case of structural delineations.

Thus, recall the principle of *oriented subject matter invariance* (OSMI) that applies to pictures, so that (for example) an (upright) picture of an upright dog will, upon rotation to an inverted position, become an *inverted* picture of an *upright* dog (rather than an *inverted* picture of an *inverted* dog). As before, I claim that satisfaction of this invariance principle is a necessary condition of something's being a picture (or, of its being a case of specifically *pictorial* visual representation). Recall also that the OSMI principle holds for a picture because *the field orientation of its subject matter* is determined by *the intrinsic orientation of the picture itself*, rather than by the *actual field orientation* of the picture.

This being so for pictures, all that is needed to find further distinctive *non*-pictorial modes of visual representation is to find distinctive ways in which an object can visually represent something, *without* its being the case that the way in which it does so satisfies the OSMI principle.²⁵ Thus in particular, non-OSMI-satisfying cases will be those in which the field orientation of the subject matter of the representing object *is* determined by its actual field orientation. Hence we are looking for cases in which, for example, an actual field *inversion* of the object itself also produces an *inversion* in the field orientation of its subject matter.

Intuitively speaking, these are cases in which one regards the subject matter as being *closely associated with* the actual physical object in question--so that if the object is inverted, then so also must be the subject matter. (See also the initial example of this in Section 2). Thus in the case of a map, which typically has a geographical region or landscape as its subject matter, when the field orientation of the map itself is inverted, the field orientation of the represented landscape, i.e., of *the subject matter* of the map, will be inverted too.

Here is an attempt to make that intuitive characterization more precise. As a preliminary, it is useful to take as an initial point of reference a map held upright so that its due North direction is vertically upwards. Its *top* is then the *North* side, in the sense that, for any point X on that North side, a line drawn perpendicularly through X and the map will identify points which are such that point X is *due North* of all of them. (With similar

definitions for the corresponding East, South and West sides). For convenience label the four sides as N, E, S and W respectively.

Next, it will be useful to define a sense in which a given side of an aligned rectangular geographical area of the subject matter, whose sides are parallel with sides N, E, S and W of the map (such as a roughly rectangular city thus aligned) on the map is 'North-facing'. A side is *North-facing* just in case it is closer to the North side of the map than are the other three sides of the area. (With similar definitions for the corresponding East, South and West-facing sides).

As a further step in these definitional preliminaries, an *aligned area* is *itself* North-facing just in case its North-facing side is also its current field top. Thus in the case of the map's initial upright orientation, with the North side at the top, any aligned rectangular area will be such that it is North-facing (that is, with its North-facing side being the *current field top* of that area). And finally, the subject matter as a whole of the map is North-facing just in case any exhaustive division of all of its content into contiguous aligned areas is such that all of those areas are North-facing.

Next, suppose that the map is inverted. This will have the result that all of the previously *North-facing* aligned rectangular areas of the map's subject matter will now have become *South-facing* subject matter areas--because the new field top of each area will be its *South-facing* side rather than (as previously) its North-facing side. Hence the subject matter as a whole will have become South-facing too, so that as desired, we now have a

more precise characterization of a sense in which a field inversion of the map itself has produced an inversion in the field orientation of the subject matter of the map.

These two cases--of a map in two distinct field orientations--provide examples of what I shall call *aspect* or *aspectual* visual representation, in which an object (such as a map) in a particular field orientation visually represents a subject matter that has *the same* field orientation as does the object representing it.

To summarize and generalize from the example given, aspect representations or delineations have two logical features that should be remarked on. First, they are *internally consistent*, in the sense that, for instance, if the content as a whole of a map-like delineation is North-facing, then each of the regions making up that content is also North-facing. Also, their field orientation is of course consistent with that of corresponding physical regions of the map itself, since each has an identical field orientation.

In addition to internal consistency, a principle of (what could be called) *external consistency* of oriented representational content also applies to aspect representations, in that--as shown above--if a map is inverted then the oriented content of the map is *also* inverted from its previous field orientation. Thus if the original map content was North-facing, an inverted map *aspectually represents* an inverted, South-facing content, which oriented content is (as was the North-facing content previously) also doubly consistent--both internally and externally--with its corresponding map.

Hence, in the case of internal consistency, for a *given* orientation of the map, each map element aspectually represents some oriented map content *in the same way* as every other map element; while for external consistency, each *different* orientation of the map itself aspectually represents *in the same way* a *correspondingly different* orientation of the content of the map.²⁶

Turning now to the wider context in which this notion of aspect representation was introduced, it is apparent that the external consistency principle holding for aspect representations is *inconsistent* with the oriented subject matter invariance (OSMI) principle for pictures. Or in terms of an example, in the case of a picture of a dog, if an upright picture of an (upright) dog is inverted, then it becomes an inverted picture of a (still) upright dog. But in the case of a map, if an upright map that aspectually represents an 'upright' or North-facing content is inverted, then the map becomes an inverted aspect representation of an '*inverted*', *South-facing* content. Hence it follows that cases of aspectual representation are not also cases of pictorial representation. I conclude, then, that aspect representation is indeed a *delineative* rather than *depictive* representational concept.

VI Aspectual Versus 'Contra-Aspectual' Delineations

In the previous Section I gave two consistency principles (internal and external) for aspect representations. However, a further principle is required to complete the definition of a desired kind of close correspondence obtaining in cases of aspectual representation, as the following thought experiment will show.

As is well known, because of the laws of optics the human eye produces an inverted image on the retina for any object that is seen. Now normally we somehow perceptually compensate or adjust for this, so that objects are nevertheless seen in their actual upright orientations (so that we are 'perceptual compensators'). However, it is easy to imagine that some other people might be (what could be called) 'perceptual literalists', who see things only in the same inverted form as that produced by their eyes as images on their retinas.

Imagine, then, such a person seeing what is actually an inverted map (labelled as in the previous Section), with actual side S at top, and with its actual inverted content being South-facing. However, a 'perceptual literalist' will not see it that way; for him, it will look exactly how an upright map with North-facing content looks to us 'perceptual compensators'.

For such a person, it is unavoidably true that it is actual side *S*, rather than actual side *N*, which seems to him to be the North-facing side on the map. For it is only when side *S* is actually at the top that he is able to see the map as representing North-facing content.

Now clearly this view of things is profoundly unintuitive for us 'perceptual compensators', and we have right on our side, too, because we see side *N* as being at the top when it actually is at the top. However, this thought experiment does show that our way of seeing things (or more importantly, the usual way in which objects such as a map non-pictorially and non-structurally represent things) is not the only logically possible way.

Thus our kind of 'aspectual seeing', which links a perceived top to the same actual top of the physical map, should be viewed as providing an additional principle or necessary condition for aspectual representation (in addition to the two consistency principles already discussed). And hence what 'perceptual literalists' see could instead be described as '*contra-aspectual seeing*', since it inverts a necessary condition of aspectual seeing properly so considered. However, because of the fatally flawed epistemic status of a 'contra-aspectual representation', I shall not consider this as amounting to a legitimate extra kind of visual representation, and so no addition to the three varieties already considered is needed.

VII Integrative Representation

In discussing the external consistency of cases of aspectual representation, I said that it holds when each *different* orientation of a map itself aspectually represents *in the same way* a *correspondingly different* orientation of the content of the map. However, it should be clear from this that external consistency holds between multiple cases of aspect representation. Yet at the same time, all of these cases are represented by the same single physical map (in its various possible different orientations). Thus one is led to inquire as to whether another more *integrative* or *summative* concept of representation could be applied so as to unify these disparate cases of aspect representation.

In a more mathematically precise form, the suggestion is that a new concept could be defined, of an *integrative* delineative representation, it being a *summation* or *integration* of a continuous series of all of the *aspect* representations of a given content, each of which represents that content in some particular orientation. Or, put more simply, the concept of integrative representation generalizes the concept of aspect representation (which applies only to one particular orientation of a map, and of its content) so as to apply to all possible cases of the orientation of a map. And hence, of course, integrative representations are themselves delineative or non-pictorial for the same reasons as for aspect representations themselves.

As an initial example of integrative representation using a map (which also brings in cases of aspect representation), recall that on a road trip it is often helpful to turn a map to

an angle at which the road as represented on the map is parallel with the actual road on which one is traveling, and with a specific orientation so that what looks like the road ahead on the map corresponds to the actual road ahead of oneself. (In this way it becomes easier to find visual correspondences between the map and the actual landscape). This activity may involve many turnings of the map (including of course to any possible specific orientation within the 360 degrees compass of the map), so that the particular orientation of the map depends on one's specific direction of travel at any given moment.

In such a case it seems intuitively natural both to think of this use of the map as comprising a *single* representational function of the map (in which case the map would be regarded as being used in an *integrative* representational way), yet also as its use being made up of many particular episodes of: the map in a particular orientation representing its content in a particular orientation (in which case each episode is being regarded as a case of *aspectual* representation).

Turning to another kind of example, I would claim that *trompe l'oeil* paintings should also be regarded as integrative or aspect delineations, rather than as pictures.²⁷ For insofar as (by definition) such paintings seek to 'trick the eye' into regarding their representational content as being real, then it immediately follows that any rotation of the *trompe l'oeil* painting must be perceived as also being a rotation of (what is in fact) its representational content, on pain of the illusion failing to work. Thus, successful *trompe l'oeil* works *must* function delineatively rather than pictorially. This account also has the

advantage that it explains successful trompe l'oeil cases as being genuine cases of *visual representation*, in spite of the fact that no (specifically) *pictorial* representation is involved.²⁸

In concluding this section, I shall summarize some deeper reasons for the noted orientational differences between structural, integrative and aspect delineations on the one hand, and pictures on the other. (See also Section 2 for some related points).

First, it is clear that, since a single physical map can be involved in three different kinds of delineative representation, therefore the sortal or object-referring concept of a 'delineation' itself must refer to the *same* physical object in each case, so that delineations are physical objects. What distinguishes the three classes of delineations is not the referent of the term 'delineation', but rather the characteristic orientational differences between the representational *contents* in each case. Thus delineative kinds are kinds of representational content, each of which, however, is also associated with a characteristically different kind of orientational *use* of the (single) physical object in question so as to achieve the desired kind of representational content.

Given that delineations are physical objects (such as a particular map or diagram), it follows that when that physical object changes its orientation, then so inevitably does each area that represents the subject matter of that object (when it is interpreted as an integrative or aspect delineation). Thus in this (perhaps relatively simple or basic) *delineative* mode of visual representation, changes in

orientation *in various areas of the object* are naturally seen or interpreted as changes in orientation *of its subject matter*. For example, a formerly upright line on a map is rotated to a horizontal position, in which case it is naturally delineatively interpreted as (what is now) a *horizontal* road, rather than as (what was formerly) a *vertical* road.

However, with pictures on the other hand, a picture of a vertical road does *not* become a picture of a horizontal road merely because the picture is rotated from a vertical to a horizontal position. Thus in this (perhaps less basic or more sophisticated) *pictorial* mode of visual representation, in some cognitive way a pictorial entity is defined²⁹ that has an *intrinsic* orientation, so that its rotation makes no difference to the orientation of the picture's subject matter, which orientation is invariant because it is defined *relative to the intrinsic top* of the picture, rather than relative to *its current field orientation*, as is the case with an integrative or aspect delineation. Thus at bottom the distinction between pictorial and (integrative or aspect) delineative representation is as basic as the distinction between intrinsic orientation and field orientation itself.

VIII Possible Pictures Versus Delineations

Here now is another example illustrating ways in which pictorial concepts are distinct from delineative ones. One might encounter a picture-like object (that may or may not

actually be a picture), but initially be unable to *visually understand* it as a picture. One might be able to see that it has *some* representational content in some areas, but nevertheless one does not (yet) see how those areas of content could be integrated together into a single picture. Thus, in an important sense, one cannot (yet) perceive this object *pictorially*, or *as a picture*.

In such a case, it is necessary to distinguish two concepts or phases of specifically *pictorial* perception: first, an *exploratory* one, in which one mobilizes one's *picture-related* conceptual and perceptual resources in an *attempt* to discover a picture, and second, an achievement or *occurrent* concept, which would apply only if one is currently actually perceiving a picture. The case in question is admittedly a case of *exploratory* pictorial perception, but it is not (or not yet) a case of *occurrent* pictorial perception.

However, surely, in one's (so far failing) attempts to see the object *as* a picture, there are *some* perceptual activities going on that must *already* qualify as achieved or *occurrent* perception of the object *as a visual representation* in some respect or respects (or at least, as *occurrent* perception of parts of the object *as* having representational content). I claim, therefore, that there has to be some more permissive or less demanding concept (or concepts) of *occurrent* visual perception of a representation, to supplement the (currently inapplicable and more sophisticated) concept of *occurrent pictorial* perception--and that an *occurrent* form of the concept of *integrative delineative perception* can supply what is required here.

Thus what is needed is an account that acknowledges that, in a case such as this, there is both an *exploratory* pictorial perceptual activity occurring, and also some *already achieved perceptual recognition of some representational content* (or content fragments), which fragments are (presumably) used in a trying out of various different 'perceptual hypotheses' concerning the relations of those representational fragments; and this is a role tailor-made for (a more generalized concept of) *integrative delineative* perception, in which content elements are viewed as in various ways *changeable* or *re-arrangeable* relative to each other, until one best interpretation is fixed on.³⁰

Now to be sure, the hypotheses in question are indeed (exploratory) *pictorial* hypotheses; but my point is that such hypotheses would have nothing to work on without a supply of already-perceived *non-pictorial* (integrative delineative) content elements.

There is also a significant role for *structural* delineative perception in this case, that is revealed by inquiring as to what should convince a reasonable person that she had *failed* in her attempt to perceive a picture in such a case. I claim that the only reasonable ground on which to give up and admit failure is if one is reasonably sure that one has *succeeded* in *another* perceptual task, namely that of grasping as a whole the structure of whatever actual (visual) representational content one has succeeded in perceiving. For it is only if one is (reasonably) sure both that one has indeed perceived that whole structure (that is, perceived the *structural delineation* associated with the object), and that the thus-perceived structure is *visually chaotic* (or insufficiently coherent to be interpretable

instead as a genuine pictorial content) that one has any good reason to give up one's attempt at pictorial interpretation.³¹

A possible objection to my view should also be considered, arising from an opposite case in which exploratory picture perception were instead *successful*. Would this be a case where my structural delineative test would prove the representational content to be visually coherent, and hence pictorial in nature, so that a supposed non-pictorial, structural delineation turned out to be pictorial after all?

My answer is that this objection confuses non-oriented, structural delineative content with oriented pictorial content. It is indeed the case (I would claim) that the visual coherence (or otherwise) of the non-oriented structure of the representational content can provide a sufficient condition or test of whether the object in question *could* be perceived as a picture, or not. However, the coherence (or otherwise) that provides the evidence in these cases is not an oriented *pictorial* coherence, but instead just a delineative or non-oriented *structural* coherence. There is all the difference in the world between an object's qualifying as a *potentially perceivable* picture in virtue of some minimal structural coherence of content, versus its having a corresponding *pictorial* coherence in its content, and particularly one of an *aesthetically interesting* kind--as any failed painter with little or no artistic talent (but who nevertheless succeeded in applying the lessons of his art theory courses, regarding coherent painterly structure, to his paintings) could attest to.

IX Uses of Delineations and Depictions

Now that some basic distinctions have been made between delineations and depictions, I shall conclude with some brief further (see Section 2) discussion of a perhaps ancillary, but nevertheless significant, issue concerning the relations of these two categories of visual representation.

This issue is as follows. It seems quite possible that a *delineation* (such as a map or diagram) could itself also be interpreted or used in some *pictorial* manner. While on the other hand, it seems that *pictures* themselves could be used in *delineative* ways, such as in the case of an aerial photograph that is readily usable as a map. How are such cases to be accounted for?

One basic point in reply is that an object that normally represents in delineative ways (such as a map or diagram) may nevertheless be *usable* pictorially, and vice-versa. Thus, a map remains a *map* (that delineatively represents in the three ways discussed) even if ways are found to use it pictorially. And similarly, a picture is still a picture, even if ways are found to *use* it delineatively.

Here are two other examples, one of each kind. As a further example of a picture used delineatively, a specially prepared representational painting (which would normally be regarded as a picture) might be *used* by a spy to convey geographical information, in which case the painting is *used* in delineative ways as if it were a map or diagram.

Or, on the other hand, a normally delineative map might be exhibited as a fine specimen of the engraver's art, in which case the intentions of the exhibitors give prominence to one specific orientation (the normal, upright one) over other possible orientations, so that the map as a whole is regarded as a picture having its own intrinsic orientation. Thus from this point of view, if the pictorially-used map were inverted, then its oriented content would remain the same as before, instead of changing as in its integrative or aspective uses.

A deeper explanation of this case is as follows. Clearly one could take a map and photograph it, so that one ends up with a *picture* of the map. Since this picture is a picture *of the map*, its content or subject matter (namely, the map) will remain orientationally invariant if the picture is inverted. However, *any* map could be thus regarded or used *as* a picture of a map--and with good reason, since most likely any commercially produced map started off *as* a photograph (that is, a picture) of some original hand or computer-drafted map. Hence it is possible to satisfactorily explain pictorial uses of such delineations.

As for delineative uses of pictures, these too may be readily explained in more basic terms. On my account, any picture is *associated with*, but is not strictly identical with, a physical object (see Section 2).³² But then it will always be possible to consider that object simply as a physical object in its own right (ignoring its pictorial connections), and then go on to consider ways in which that

same physical object might delineatively represent (in various ways) some content. So here too, 'crossover' uses of pictures and delineations pose no fundamental problems for my account of them.

Thus, in sum, I hope to have provided a useful framework for further investigations into the many interesting issues associated with the various kinds of visual representation.³³

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Footnotes

¹ Thus I shall use the terms 'subject matter' and 'representational content' interchangeably in this paper, as having no implications as to whether there actually is some subject (namely, some actual object, event or state of affairs) that might serve as a standard of correctness or appropriateness in each case of visual representation. On the distinction of content from (actual) subject see Dominic Lopes (1996, 3-4).

² Of course, there is much argument as to exactly how the relations between a pictorial representation, its subject matter, and its actual subject (if any) should be characterized, in such works as Nelson Goodman (1968) and Richard Wollheim (1987). But my current concerns lie elsewhere.

³ They also have differing identity-conditions, as discussed in Section 2.

⁴ I introduced these concepts in a paper "Pictorial Orientation Matters," submitted for publication, though I hope that it is clear enough that they have a high degree of intuitive obviousness about them.

⁵ However, the concepts are also applicable to other orientational frameworks, including that of compass orientation (see footnotes 20 and 21).

⁶ For further details see my "Pictorial Orientation Matters."

⁷ As a non-normal example, it is possible that an artist might clearly indicate which side of a given picture would *normally* be considered as its intrinsic top (such as by the orientation of her signature, or a title placed below the picture, etc.), yet nevertheless deliberately arrange to have the picture hung in a position *inverted* from that 'normal' orientation--thus acting within the avant-garde tradition of mocking or subverting 'normal' artistic conventions. I discuss such cases in my paper (2002).

⁸ This is not to deny that, from the differing epistemic perspective of a picture's creator, her desire to represent the subject matter as having a given field orientation determines which side of her painting--assuming that the subject matter has already been painted there--she should count as defining the intrinsic top of the corresponding picture. Thus the actual relation in question is one of co-determination, in that knowledge of either enables the other to be fixed.

⁹ However, choosing such an example, in which the subject matter itself has an intrinsic orientation, is not necessary to the point being made; I do it only because it is easier to describe the field orientation of a subject using a term such as 'upright' that implies an intrinsic orientation for any object that it describes.

¹⁰ One caveat should be mentioned. In my paper (2002) I discuss various theories of pictorial inversion, including theories that would *deny* that a picture retains its identity through rotation. However, a modified form of the OSMI principle would still apply in

such cases: the *family* of distinct pictures (namely, those corresponding to various rotational stages of what we normally consider to be the *same* picture through rotation) would still be such that their subject matters each have the same invariant field orientation.

¹¹ I discuss such pictorial ambiguity cases in two other papers, "Pictorial Orientation Matters" and my (2002). Further arguments for distinguishing pictures (and other visual artworks such as sculptures) from physical objects are given in my papers (2001a) and (2001b).

¹² My thanks to anonymous referees for the objections.

¹³ For the distinction of representational content from actual subject see the opening paragraph of the paper, and fn. 1.

¹⁴ Trompe l'oeil paintings will be discussed in Section 7.

¹⁵ Lopes (1996, 94).

¹⁶ By which he means roughly a picture or depiction in the above sense, minus any trompe l'oeil paintings, minus any (in his view) non-representational abstract pictures. See Wollheim (1987, 62).

¹⁷ Wollheim (1987, 60-61).

¹⁸ Indeed, an aircraft or satellite *photograph* of an area of terrain (which, as a photograph, is surely a picture, if anything is) could be *used as* a map, and it would *become* one with only minor visible alterations (such as suppressing irrelevant details, or adding captions). Thus for me, the burden of proof regarding maps lies with those who would *deny* (as shall I) that they are pictures.

¹⁹ I shall discuss *pictorial* interpretations of maps in Section 9.

²⁰ This is so because, if the map were placed horizontally, and its North-facing side were aligned with a (North-pointing) compass needle, then this would count as being the 'upright' or 'standardly aligned' orientation of the map. However, it should be pointed out that the geographical or geometric *relationships* made possible by a compass grid (such as that one place A is South-East of another place B) constitute invariant or *structural* information, of the kind I am claiming to be involved in a structural map interpretation (see the next footnote).

²¹ To be sure, some structural information may *indirectly* depend on intrinsic orientation, in that it is in some sense 'part of the meaning' of a claim that place A is South-East of place B that there is also some method of standardly aligning the map with an actual compass needle (hence determining an '*upright*' position for the map, with its North-facing side thereby counting as its *intrinsic top*), so that the map content may correspond

or be aligned with actual geographical relationships. Nevertheless, A's being South-East of B is of a piece with A's being twice as far from B as is some other place C--all of it is invariant, structural or geometric information that takes no direct account of either a map's current field alignment relative to an actual landscape, nor of any additional ways in which that purely structural information may be linked to an intrinsic top so as to maximize the representational utility of the map.

²² Also, it should not be overlooked that many diagrams or blueprints may themselves include symbols or words that do indeed require literal reading, so the effects of such linguistic parts should not be allowed to confuse the issue of the status of the *non-linguistic* parts of a map or diagram.

²³ Of course, with some diagrams such as an electrical circuit diagram, there is less reason to say that it delineates any specifically *visual* subject matter. However, as Wollheim points out in another connection, it is possible to hold that an item may visually represent *non-visual* aspects of a subject matter--so that, for instance, a painting of Laocoon can represent him as about to cry out in agony, which is a future sonic event: Wollheim (1987, p. 67). But in any case, clearly there can be genuinely visual representations which at least *attempt* to delineate non-visual subject matters, so that the diagram itself may still be interpreted visually as a delineation in such a case, no matter how little specifically visual subject matter information it gives.

²⁴ Which is of course the cognitive side of a claim that some objects are structural delineations.

²⁵ So far, one such mode has been found, that of *structural* visual representation, which fails to satisfy the OSMI principle because an object (such as a map) in this mode fails to have an *oriented* subject matter of *any* kind (no matter what orientation it itself may be placed in).

²⁶ In the next Section I shall argue that an additional principle (concerning the identification of a perceived top with an actual top) is needed to complete the characterization of aspectual representation.

²⁷ Thus I agree with Wollheim's view that similarly denies picturehood to such trompe l'oeil paintings--but, as with maps, for different reasons than his. See Wollheim (1987, 62).

²⁸ Thus my account may have some advantages over that of Susan Feagin (1998), who in an otherwise insightful discussion argues that trompe l'oeil paintings 'present' rather than 'represent' things.

²⁹ See my (2001b) for an account of what is involved in this process.

³⁰ This is of course a more abstract sense of 'changeable views of content', or of changeable orientation with respect to content, but it is one that befits the exploratory context.

³¹ The issue here should be distinguished from that of aesthetic evaluations of the 'pictorial unity' of a picture, which evaluations arguably presuppose that an object is indeed a picture (even if a poor one because of its relative disunity).

³² Also see the papers mentioned in fn.11.

³³ My thanks to CJP anonymous referees for very helpful comments on an initial version of this paper, and to audience members at the American Society of Aesthetics Eastern Division Meeting in Philadelphia, April 2001, for useful comments on a more distant precursor of this paper (entitled "Re-Orienting Artistic Depiction").