

The Chirality of Being: Exploring a Merleau-Pontean Ontology of Sense

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Abstract: The problem of ontology includes the problem of how being is determinate and has sense, i.e., orientations, meanings, differences that make a difference. This paper explores the thought that being's sense stems from an 'ontological chirality,' a kind of ontological difference with characteristics kin to differences between left and right hands. The paper first shows how Merleau-Ponty's ontology of reversibility leads to issues of chirality. Results in chemistry, biology and geometry are then discussed to illuminate the importance of chiral differences and to develop a definition of ontological chirality that connects with an ontology of sense.

Being *is*. But being is also *something*, it is determinate. The problem of ontology is not only or so much saying how it is that being is, but how it is that being is determinate: how being has orientations, senses, meanings, differences that make a difference, rather than being an indifferent blank void of all sensible determinations. This paper explores the thought that being's sense stems from an 'ontological chirality,' a kind of ontological difference with characteristics kin to differences between left and right hands. The concept of reversibility in Merleau-Ponty's later ontology led me to this thought, so I begin by briefly showing how chirality lurks within reversibility—especially in a relation between activity and passivity that is crucial to reversibility. I then discuss results in chemistry, biology and geometry to illuminate the importance of chiral differences and to develop a definition of ontological chirality that connects with an ontology of sense.

Reversibility, a concept central to Merleau-Ponty's later works "Eye and Mind" (OE) and *The Visible and the Invisible* (VI),¹ indicates both a relational structure and its ontology. For Merleau-Ponty the perceiver and the perceived in general are reversible. He often illustrates this with touch. To say

that the toucher and touched are reversible is to say that in virtue of being a being who can touch something I am inherently also a being who can be touched.² Being touched is thus an inherent reverse or flip side of touching, it is its lining ("*doublure*"³). But Merleau-Ponty goes further than this: the fact that my active touching inherently reverses to passive thingliness means that "the world is made of the same stuff" (OE 19/163) or "'element'" (VI 184/140) as the body. Strangely, this also implies that active touching is an inherent reverse side of being passively touched, and not merely in my body: things have an active sense that is the reverse of the passive sensing they prompt in me; without this affiliation between my body and things, I could make no sense of them.⁴ This echoes Merleau-Ponty's earlier effort to root perception in a pre-personal field of sensibility.⁵

The phenomenon of reversibility thus indicates an ontological complicity between the perceiver and the perceived, between the active and the passive, the inside and the outside, and so on. Crucially, this complicity never reduces the differences between reversible terms: touching never coincides with being touched (VI 194-5/147-8), activity and passivity must remain incongruent if perception is to do its work—a crucial point that Merleau-Ponty is working out in his later ontology and study

of passivity.⁶ Nonetheless, the peculiar relation between reversible terms is such that they can reverse to one another: the toucher can itself reverse to being touched.

Let us think about the relational structure and ontology of reversible terms. These are not related like reverse sides of an LP record. First, while LP sides always come back to back, each side is determined by information with its own independent structure. So changing a side into its reverse involves stamping new information on the record from the outside, rather than the sort of internal convulsion through which a touching hand itself reverses into a touched hand. LP sides lack the ontological complicity of toucher and touched as themselves reversing into one another. Second, on the other hand, LP sides are too much made of the “same stuff.” In the vinyl and information of the two LP sides, we find nothing like the irreducible difference between toucher and touched.

The ontological relation between reversible terms is closer in kin to that between right- and left- hands or gloves. (Note that our concern here is the sort of glove that *cannot* be indifferently fit on either hand.) Kant calls such figures “incongruent counterparts”⁷; in geometry each such figure is called an *enantiomorph*.⁸ What is distinctive of an enantiomorph, is that there is no rotation or translation that will superpose it on its mirror image; a square or circle can be translated (moved in the plane) or rotated so that it exactly superposes on, occupies the place of, its mirror image, but a glove cannot. Like enantiomorphs, toucher and touched are incongruent because the one cannot be reduced to or take the place of the other; they are counterpart so far as they are made of the same stuff and are inherently complicitous. Yet a right-hand glove can reverse to its left-hand “incongruous counterpart” when it is turned inside out.

When turned inside out, the blue, right-hand dish-glove, lined inside with white flocking, turns to a left-hand, white-flocked glove, lined with blue rubber. (The reader may want to try this at home.)

Reversibility implies a similar latitude within being itself, wherein being, by an internal convulsive operation (like being turned inside out) reverses from perceiver to perceived. Since the perceiver and perceived are made of the same stuff, their divergence (*écart*) into incongruent counterparts must be accomplished by such an internal operation. The perceiver and the perceived are thus two different, incongruent ‘inflections’ of being. (Crucially, they are not two different *appearances* of one being; the point behind this is subtle, so it is left for a note.⁹) Geometrical enantiomorphs, such as hands, but also enantiomorphous molecules, forces, or organisms, exhibit handedness or *chirality*, a term introduced into chemistry by Lord Kelvin, who draws it from the Greek *cheir*, for hand.¹⁰

Merleau-Ponty suggests a link between chirality, reversibility and *écart* in several places. One especially relevant passage is in a working note that begins “Reversibility: the finger of the glove that is turned inside out.” (VI 317/263)¹¹ While its topic is inside-out, not left-right, reversibility, the passage’s point seems to be that the glove’s curvature internally indicates its reversibility into its incongruent counterpart, via what Merleau-Ponty calls “double representation.” This is to say that if we are looking at a glove that is right-side out, its curvature represents or indicates *both* the surface of the right-side out glove and of the inside out glove. Similarly, we could say that its curvature represents *both* the left-hand glove and the right-hand glove. No outside standpoint is needed to grasp this reversibility—it is indicated right within the curvature of the glove. The ontological implication is that in virtue of reversibility,

being itself involves a kind of doubling or internal incongruence such that in its very unity, being is inflected with being two different ways.¹²

This “double representation” also strikingly illustrates a key ontological insight of Merleau-Ponty, namely that the invisible is not an essence or idea beyond being, but is endogenous to, *of* visible being. Consider, once again, the blue, right-hand dish-glove, lined (doubled) with white flocking. If we turn it inside out, we will see a left-hand, white-flocked glove. Where is the left-hand, white glove when we are looking at the visible, blue, right-hand glove? It is invisible—yet also there in the visible glove. In saying this, I am drawing on an issue central to the debates about Kantian incongruent counterparts and enantiomorphs. It has to do with a difficulty of defining and grasping the determinacy of enantiomorphs in the first place, a difficulty to which we will return. Roughly put, the issue boils down to this: do the left- and right- hand gloves have the same shape, but with each shape having a different sense than the other? Or do they have different shapes?¹³ That is, are left- and right- hand gloves two different shapes, or two different ‘flavours’ or senses of one shape? The issue is really quite difficult and subtle, for we seem to have to say “yes” to both questions—in somewhat the same the way that positing $A=B$ entails both an identity and difference of A and B . For the left-hand glove is the incongruent counterpart of a right-hand *glove*, not of a shoe or a mitten, or a glove for seven fingered aliens, which suggests they do have the same shape; again, we precisely pair the left- and right- hand gloves because, as gloves, they share a shape. And yet, the gloves in the pair are not superposable on one another, and in this sense they have different and incongruent shapes. I do not propose to answer here the question of whether the difference between

members of a chiral pair is a difference of shape, or of something else such as sense. Really, the answer being sought here is more about how to properly pose the question.

With respect to double representation and the invisible *of* the visible, though, the question gets us to notice that the areas that make up the right-hand glove are topologically connected in a way that runs in parallel to the connectedness of areas that make up the left-hand glove. In this sense, at least, the gloves have the same shape. Indeed, you cannot have a right-hand glove ‘shape’ without also implicitly having it lined with areas with the kind of connectedness that could show up as a left-hand glove ‘shape’. *Yet, that left-hand ‘shape’ is invisible in the right-hand glove.* It is there lining the right-hand glove, but you cannot see it as left-handed until the glove reverses from inside to out—and then the right-handedness of the glove becomes invisible in the visible. Of course, we should not think that the invisible *of* the visible, in Merleau-Ponty’s ontological sense, is the exactly the same as the left-hand glove’s invisibility in the right-hand glove. Nonetheless, this gives a powerful illustration of the logic at hand in Merleau-Ponty’s ontology of the invisible *of* the visible, and suggests a close proximity between reversibility and that ontology.

The illustration also emphasizes the incongruity of members of a chiral pair, a kind of gap between them, a gap that is paradoxically central to their pairing and to reversibility. This gap is suggested by Merleau-Ponty in a passage where he himself discusses chirality. Asking us to “[c]onsider the right, the left,” and, referring to Kant’s discussion of incongruent counterparts, he writes that the “two” parts of such pairs announce “a fragmentation of being” that is “the possibility for *discrimination*” and “the advent of difference.” (VI 270/216-7) This reinforces

the point that an incongruence between reversible terms is crucial to Merleau-Ponty.

Indeed, Merleau-Ponty speaks of the seer and seen as “mirror arrangements” (VI 192/146), and, in a discussion of the incongruence of the toucher and touched, connects this with the phenomenon of the relation between the body and its specular image in a mirror (VI 303/249). This point about the specular image is repeated in a discussion of the divergence between toucher and touched, after a remark that “flesh is a mirror phenomenon” (VI 309/255-6). And in the nature lectures he writes of the touched and touching hand that “they are the mirror of each other,” and there “is something analogous in the relation with things.”¹⁴ And of course reversibility is most often illustrated with the example of the left hand’s act of touching (when it touches the right hand) reversing to a passive being touched; that is, this reversal is taking place between chiral counterparts. Finally, we should remember that Merleau-Ponty draws his term “chiasm” from the peculiar cross-over of optical nerves from the body’s left and right sides.

The above gives strong evidence that the theme of chirality is not far from Merleau-Ponty’s mind when he is thinking about reversibility. The thought I am pursuing here is that reversibility and chiasm in fact imply chirality, a kind of difference that, as we shall see, is fundamentally—perhaps ontologically—different than other differences. To be a bit more precise, the thought here is that being exhibits reversibility, *écart* and sense in virtue of being chiral—in the relevant ontological sense developed below.

Put otherwise, *The Visible and the Invisible* seeks a new and heretofore unnamed element of being, called flesh. (VI 193/147) Flesh is novel in engendering sense within itself, rather than being senseless matter or requiring transcendent

senses introduced from without. Flesh engenders sense through *écart* and chiasmatic reversibility. The point so far is that this involves chirality. The thought I explore is that this means that the difference elemental to being is not, for example, a difference between exclusive opposites, like being and nothing, but a difference with characteristics echoing the peculiarities of chirality. To better understand the philosophical significance and peculiarity of chirality, I survey results showing how chirality is pervasive in our universe and fundamental to life and sense. These results repeatedly lead to problems about chirality that point to its peculiarity and let me develop an ontological understanding of the term.

That chirality might have deep philosophical significance should not be surprising, for Kant inaugurates modern studies of chirality by arguing that the left-right difference has implications for the nature of space.¹⁵ It might seem, though, that geometrical or spatial differences are too formal to illuminate anything like ontological differences. But *enantiomers*—molecules that are chemically identical except for the chiral arrangement of their atoms—are pervasive in nature, and molecular chirality can make the difference between drug and poison. While the right-hand enantiomer of Thalidomide tempers morning sickness, its left-hand version causes mutations; disastrously, in a molecular echo of Derrida’s point about *pharmakon*,¹⁶ the human body can reverse the right-hand cure delivered in the pharmacist’s pill into the left-hand poison.

Enantiomers, and more specifically, *homochirality*, a bias toward left- or right-hand versions of enantiomers of given molecules, are in fact crucial to life.¹⁷ Pasteur, who is the one who discovered that molecules have asymmetry and also that living organisms selectively consume

molecules according to the chirality of their asymmetry, thought that only living things could produce homochirality, and that this discovery allowed for a “well marked line of demarcation...between the chemistry of living matter and the chemistry of dead matter.”¹⁸ Just as Bergson writes that “[w]herever anything lives, there is, open somewhere, a register in which time is being inscribed”¹⁹ we could say that wherever there is life, there is bias. In terrestrial life forms, the bias is such that amino acids are in left form (with few exceptions²⁰), while sugars are mostly in right.²¹ Interestingly, physicist Gideon Gilat²² argues that chiral molecules are of evolutionary advantage, since their energetic interface with the world sets up temporally irreversible processes crucial to life, that is, in homochiral vs. other sorts of molecular populations, it is more likely that chemical reactions will go in one direction only (e.g., components binding into products, but not products breaking down into components), which means that detecting the products (vs. components) of chemical reactions gives a measure of time passing (the components are in the past of the product). This would mean that the Bergsonian inscription of time and chiral bias are connected.

Homochirality on the micro level inflects its way upward: helices and fibres formed from chiral molecules twist in one direction only; so seemingly symmetrical muscles on opposites sides of the body in fact have fibers that twist in the same direction, which means that our bodies in fact have a deep geometrical asymmetry (the muscle fibres in your left and right arms spiral in the *same* direction, so on this level, your left and right sides are *not* mirror images of one another).²³ Strangely too, there are drugs that effect one side of the body more than the other, suggesting that between the sides of our body there may be

“subtle molecular differences” left over from embryogenesis.²⁴

Indeed, molecular chirality and animal asymmetry are linked phenomena. Most animals exhibit bilateral or radial symmetry (although radial symmetry is really bilateral ‘underneath’, as in the starfish). But animal symmetry is pervasively broken by asymmetries on various levels. Humans exhibit left- or right- handedness and brain lateralization, and our hair parts to one side. Some animals exhibit asymmetric patterns on their surfaces, and some crabs develop oversized claws on just one side. Many snails have shells spiralling in just one direction typical of the species, and hermit crabs specialized to inhabit the shells of such species have muscles that asymmetrically twist their bodies to fit the shells. Beneath outer symmetry, our internal organs are asymmetric and asymmetrically placed relative to one another—and these asymmetries are crucial to the function of organs and the body as a whole.²⁵ Disturbances of these asymmetries, such as dextrocardia (placement of the heart on the left), heterotaxia (where each organ independently decides its *situs*) or isomerisms (where organs are symmetrical) are associated with physiological difficulties. The only exception to such difficulties is *situs inversus*, a complete mirror-image reversal of all asymmetrical organs and pairings.²⁶

We should also note that in animal and other motion, asymmetrical postures are key to action, something artists know, since symmetrical form reflects stasis, repose, passivity, even death, whilst asymmetry reflect instability, motion, action, life. This is also true at a physiological level: muscles contract by what amounts to a one way ratcheting of molecules, blood moves back to the heart in virtue of one-way valves in veins. Life is a phenomenon of one way directedness, of sense, which Aristotle

points out in his considerations of desire as an *orexis* that stretches toward things.²⁷

Asymmetry is endemic to life and arguably crucial to it. But how are the *directions* of asymmetries determined? Life entails that amino-acids end up being folded just one way, that the heart be on one side only. But what determines that amino acids are levose and the heart on the left? Life might work just as well if hearts and amino acids had the opposite chirality, although perhaps life would not be quite so robust if these molecules and organs were indifferently distributed in left and right forms.

Remembering that in geometry chirality gives incongruent figures a sense, and that Merleau-Ponty conceptualizes *sens* as a meaning inseparable from directedness of being²⁸, what we are broaching here is a problem about the genesis of determinate sense, of basic determinate differences that, from within being, themselves indicate the difference they make.

But on the molecular level, the problem here is the origin of what is called *homochirality*, of uniform chirality in enantiomer populations. Significantly, there is as yet no satisfactory answer to the problem, just suggestions that homochirality might first be coupled with very deep biases of our universe²⁹ (to which we return); that organisms already dependent on homochirality can produce homochiral molecules; and that spontaneous production of homochirality depends on free energy inputs, processes that favour one enantiomer over another, and an initial excess, even if tiny, of one enantiomer type. Note the question begging here: homochiral asymmetry is explained only by appeal to existing asymmetries of molecules or energy distributions. Asymmetry goes ‘all the way down.’

This problem echoes on other levels. In embryology, it is one thing to account for

asymmetry in the organism, quite another to account for the *direction* of asymmetry. The underlying problem is this: In animal embryos, establishment of the anterior-posterior and dorsal-ventral axes entails establishment of the L-R axis. But establishment of the L-R axis does yet not determine which side of the axis is in fact the left, say, the side where we typically find the heart in human beings. It has long been known how exogenous cues can determine the anterior and dorsal ends of the other axes, for example, gravity can determine what is back vs. front, or the point at which the sperm is accepted into the egg can determine tail vs. head, but “no obvious macroscopic aspect of nature differentiates left from right.”³⁰ So a process internal to the organism must make an in principle arbitrary, yet consistent, chiral determination of left vs. right, relative to anterior-posterior and dorsal-ventral determinations. While cascades of asymmetric molecules and asymmetric gene expressions at work in chiral determination have now been identified, for each such signal, “it is necessary to ask what determined its asymmetry,” and as of 2005, “no mechanism has been conclusively shown to initiate asymmetry.”³¹

To understand the point that no obvious aspect of nature differentiates left from right, let us turn to a deeper level of the problem. We inherit this problem from Kant, but it is more easily put through a variant developed by the mathematician Martin Gardner, which is also resonant with the embryo problem. Imagine we are initiating communication with a remote, alien civilization, which Martin Gardner calls “Ozma.”³² Communication of pure information can let us establish the sense of our word up vs. down or front vs. back, because we can, for example, refer to universal gravitation, or transmit pictures of our bodies with front and back labelled. It

also lets us establish the *difference* between left and right. But it is impossible to establish³³ in purely, abstract, ideal, discursive terms which end of the left-right axis is properly called left.³⁴ For example, transmitting a picture of a human body with the left labelled will not work, for the transmission needs to be decoded, and absent an already shared chirality convention for determining left vs. right, the aliens could decode our picture as its mirror image. We cannot *tell* the aliens what is left vs. right, we can only *show* it. The universe, though, exhibits a peculiar asymmetry: some subatomic events are in effect asymmetrically biased; so we can circumvent the problem by telling the aliens how the universe itself shows our chirality convention.³⁵ But this is just a remote showing, not a pure telling.

Put in Kantian terms, this implies that determinate chirality—chiral sense—is an intuitive, not a discursive concept. Here we reach even deeper levels. Analysis of the problem of chirality determination suggests it is correlative with the problem of whether, for example, a hand, on its own and without reference to anything else, has chiral sense, or is achiral.³⁶ Remember that Merleau-Ponty thinks the glove itself shows chiral difference, insofar as it itself indicates its reverse. But this does not mean that the glove itself indicates whether it would be called “left” or “right” by we human beings, according to our conventions. It is easy to think that a glove or hand could of itself have, for example, a left-hand sense. But consider a two dimensional figure of a left hand; flipping it over in 3d space or walking around to see it from the other side reverses its sense to right. If the 2d hand is embedded in a 2d surface twisted in the manner of a Möbius strip, rigid movement of the hand along the surface similarly reverses its sense. A 2d space connected in this twisted way is called *non-orientable*: there are no

figures in it that of themselves have chiral sense. Soon after Kant made his claims about incongruent counterparts, Möbius and others realized that a 3d left hand rotated through a 4d space would reverse to a right hand. For a being with a 4d perspective, 3d hands lack chiral sense. 3d and 2d hands have chiral sense only because they are embedded in an orientable space, or are locally orientable via perspectival relations to those making sense of them from within such spaces.³⁷

The above suggests that chemically and biologically, chiral sense is vital to life and might depend on an elemental asymmetry or sense of nature. On a deeper level, chiral sense cannot be determined discursively but only intuitively, and shows itself only in spaces that are orientable or oriented by finite perspectives.³⁸

These points about reversibility and chirality let me develop a definition of ontological chirality. At the ontological level chirality has nothing to do with shape or direction as such. Rather, I define ontological chirality as a difference of being that is marked by certain characteristics, namely: the difference is between terms that are ontologically counterpart, incongruent, yet reversible; the sense of the difference (specifying which side of it is which) cannot be determined by pure ideas but can only show itself; this showing depends on the difference arising through a kind of internal spread of being, that is, sense is not localizable in punctiform points or locally bounded regions, but is chirally distributed across reversible terms in different locales; our access to this sense-showing is inherently perspectival, dependent on our internality to the very being that shows difference; and such a difference is senseless for-us and in-itself if it is abstracted from being or ‘viewed from above,’ in the way that a hand lacks chiral sense in higher dimensional spaces.

Here we should note that ontological chirality is no longer being understood as a phenomenon of an homogeneous, isotropic space, but of oriented, heterogeneous spaces with their own measure or curvature, which might be better understood in terms of place—but the point at issue is perhaps rather that place has its origin in a cosmos that is ontologically chiral (without chirality, no place).³⁹ Notice also that such chiral difference involves an endogenous sense waiting to become express: since a chiral difference is inherently coupled (paired) in its very difference to other differences, it internally includes the ‘standard’ by which difference makes a difference. That is, such a difference echoes *différance*, insofar as *différance* involves the genesis of a kind of difference that is also generative of the difference by which it makes a difference. And, like *différance*, chiral difference is neither a concept (since it is intuitive, not discursive) nor purely an intuition, because it is never immediately given in a single intuition, and becomes express only through a further context generated along with it, and so requires a division or rhythm in which, for example, we double back on—and thence mediate—the two gloves given in intuition as: like but unlike one another. Really, the pairing of the gloves itself mediates their chiral differentiation, a self-mediation or differentiation that traces the logic of Merleau-Pontean expression. Again, since chiral difference is delocalized, not ever posited in some terminal, punctiform thing, it is inherently open ended, deferred—but deferred not merely temporally, but spatially through the spread of being. Here we might recall some notes on dynamic morphology by Merleau-Ponty, transcribed by Barbaras (2001), that suggest that the identity of an element such as sulphur has to do with an affinity between spread out instances of sulphur, rather than some abstract essence of sulphur being

instantiated in multiple localizable points—the determinacy of sulphur is a function of a more primordial spread of being. So we would have to say that chiral difference is also different than *différance* since it is a function of spread, not repetition and deferring—but perhaps the chiral spread of difference is also linked to the deferring of *différance*, if we remember the coupling flagged above between chiral bias and temporal inscription.

Examples of ontological chirality that come to mind are... the differences between perceiver and perceived, or the active and passive. This may sound strange, for it seems that such differences are so fundamentally clear that we could, for example, tell rather than show them to Ozma aliens. But I wonder whether this is so. An obvious strategy is to tell the aliens the difference between active vs. passive by sending a picture of a hand touching something, with the touching hand labelled active... but here reversibility confuses things: the touching hand is also passive. And such telling presumes experience of the body as a centre of agency. But there are people here on Earth who feel themselves being touched when another person’s shoulder is touched;⁴⁰ children do not always feel their agency as limited to their bodies; and we can be made to feel a rubber hand as part of our body.⁴¹ Also, when working together we feel active in others,⁴² a point that Merleau-Ponty captures in his description of watching a soccer game in such a way as to feel involved/moving with what is going on with the players.⁴³ Telling aliens/others the active-passive difference likely presumes shared experiences of bodily feeling and agency, for example, the feeling that hammering a nail is active (vs. a passive enslavement to things), or that death is suffering (rather than liberation). Are these necessarily universal?

Perhaps physics can us get out of this, but introducing a true active-passive distinction into physics requires something like an absolute distinction between motion and rest, which requires reference to a Husserlian *Boden*—which may, again, not be universal (in the sense that what counts as *Boden* may not be universal, even though the ‘need’ for *Boden* is).⁴⁴ Indeed, it seems to me that one of Newton’s key innovations, and one that is central to modern physics, is to remove the need for an irreducibly basic distinction between passivity and activity, since, famously, for Newton, rest is not an independent phenomenon with its own explanation, as it is for Aristotle. Once Newton has the idea of inertia, and of the interrelation between acceleration, mass and force, the problem is not explaining how things stay at rest or keeping moving, but what accounts for a change between motion and rest, but for such an account to be possible, motion and rest must be seen as belonging to one continuum, with rest simply as a zero point of motion, which removes a sharp distinction between motion and rest, and thence between activity and passivity.⁴⁵ Whether something is active or passive, in motion or at rest, is relative to the selected frameworks of measurement. And as of yet I haven’t come across a way of capturing the active-passive distinction in purely mathematical/physical terms, without reducing activity to passivity or vice versa.

The thought here is that we cannot get past these problems, or, correlatively, to the genesis of sense, without some kind of already given chiral difference. No abstract telling can communicate ontological chirality—but it can be expressed, in virtue of a chirality already shown by being.⁴⁶

Now I think that ontological chirality as defined above resonates with reversibility, chiasm, *écart*, the need for interrogating being from within—and Merleau-Ponty’s effort to find an expressive

sense within being. The thought broached here is that all of these require an elemental ontological chirality, a sort of ontological differential architecture internal to being, that spreads out being in such a way that this very spread fissions into sensible differences, that elaborate themselves so as to contingently become express.

To cast this concluding thought a different way, with a cast of Husserl’s die: Husserl’s choice of the die-phenomenon (as one of his favourite examples) is probably not arbitrary, given what he asks us to notice in it. A die is easily held in hand or in view, so its tactile-kinaesthetic and visual horizons are easily explored on various registers (noetic, noematic, internal, external, etc.). The faces of the die are numbered, which makes it easy to name its various perceptual profiles and thence discursively describe its horizon structure (contrast trying to do this with a blank cube, or a sphere). The numbering of the faces, and the die’s cubic shape, also bring the die into proximity with ideal objects that we may wish to study. Finally, dice are mass-manufactured to exacting standards, to precisely be as alike *qua* dice as possible—the movie *Ocean’s Thirteen*⁴⁷ nicely illustrates the legalities of the manufacturing apparatus behind this and what’s at stake in this exacting invariance for the gambling industry. The die example thus builds in a strong invariance across variant instances, such that we Earthly phenomenologists, when following Husserl, need not be preoccupied⁴⁸ with possible differences between what we individual phenomenologists are touching or seeing; rather, we can focus on what Husserl is asking us to notice, namely that the sense “die,” “real die,” “imagined die,” and so on, rests in the horizontal structure of flowing perceptual profiles immanent within transcendently reduced experience. Further, the die, insofar as it is a mass-manufactured object, builds in a reference to

an inter-monadic community through which alone we find a sense of “true die,” “objective die,” “real die,” “exactly manufactured die,” and so on.⁴⁹

Now let us perform, in Husserlian manner, an imaginative variation, extending our inter-monadic community from Earthly phenomenologists to phenomenologists in the alien civilization Ozma that Martin Gardner has us imagine. Here an important fact about dice comes into play: *they are chiral*. Gardner draws this point to our attention. Modern dice, the kind that are mass manufactured and used in casinos and games are all *left-handed* (according to our convention of left vs. right). What does this mean? Suppose we want to communicate to our Ozma counterpart the sense: “left-hand die.” It’s easy enough to specify the sense “die”: communicating what numbers, squares, cubes mean is easy enough, and we can send pictures that help with this. We can also send pictures showing we how arrange dots to indicate the numbering of die faces. And we can say that a real die is such that the numbering on opposite sides adds up to seven, and the one, two, and three, faces share edges and a corner. This constrains the construction of dice by our Ozma counterparts. But given this constraint there are still two different ways to produce a die. Take a die, place it on your desk with the one-face on top, and the two- and three-faces facing you. You will notice that if you point to the one-, two- and three- faces in ascending order, your hand moves from the one-face, down to the two-face on the left, and then up to the three-face toward the right; your hand circles around in counter-clockwise fashion. This is behind *our* convention of calling *our* real dice left-handed. If the faces were numbered in the opposite way, we could call the die right-handed. Someone aware of this fact about dice could say of the right-handed die: “it’s not a real die, it’s a trick die, or a fraudulent

die.” The question here is how could we communicate the sense “real, left-handed die” to our Ozma counterpart—or *ourselves* constitute the sense “left-handed die” from within the field of transcendently reduced experience, given our awareness of this imaginative variation.

The argument above is that we *cannot* constitute the sense of “left-handed die” within the field of transcendently reduced experience, unless it, and thence the phenomenon of being, already exhibits certain characteristics that I tried to capture under the heading of ontological chirality. To put it in Husserlian terms: In his later work, specifically “The Origin of Geometry,” Husserl shows how the sense “triangle” has its genesis in historical processes of writing-down that take place in the life-world. My point is that our sense “left-handed die” has its genesis in a kind of “writing-down” that operates on a much deeper and pre-personal level, before human scripts, anterior to the life-world as human life-world: it depends on a certain operation of being that operates in advance of factual life, organismic life, human life, an operation that engenders being as chiral, that enables life to generate itself as chiral, that inscribes life with chirality. I am suggesting that this sort of operation belongs to what Merleau-Ponty hints at when he speaks of a “creative operation” (*PhP* 74/61) endogenous to the phenomenal field.⁵⁰

But even this creative operation is not enough, for determining which of an already generated chiral pair is to be called “left” would also need the writing-down that Husserl writes about, via shared history of encounters with reference to a shared being encountered, to a shared life-world; pure communication of abstract information would not suffice. Put otherwise, we and our Ozma counterpart can only communicate regarding the determinate sense of chirality, if a shared being that already operates in

generating chiral sense in a common life-world, and a shared history of writing-down, of encounter in the life-world, determinately articulates chiral sense as this or that, left or right, active or passive, and so on.

The deeper issue here is that this creative operation, and what allows for chiral sense, is an ontological chirality that cannot be secured or captured in advance by any sort of abstract analysis. It is radically contingent. Sense depends on an ontological differential architecture internal to being. But that architecture is not provable in advance, it is a contingent expression of being that has to with a future yet-to-come. The genesis of sense rests ‘in’ a throw of a die (*Würfel*), but it is thrown by no one, from nowhere, toward nothing—and yet it lands some place, some place that makes sense, and creates more sense to come. Yet for Merleau-Ponty, it is somehow ‘in’ being itself, although as a yet-to-come, to throw itself to sense.

¹ References to “Eye and Mind” are given in the form *OE* [pg# in Merleau-Ponty (1964b)]/[pg# in Merleau-Ponty (1964a)]. References to *The Visible and the Invisible* are given in the form *VI* [pg# in Merleau-Ponty (1964c)]/[pg# in Merleau-Ponty ([1964] 1968)]. References to the *Phenomenology* are given in the form *PhP* pg# Merleau-Ponty ([1945] 1962).

² There are complications here, given that Merleau-Ponty illustrates this reversibility of touch not only with the relation between the body and things, but with the relation between the body and itself, when one hand touches another, and that he also speaks of a reversibility between different senses such as touch and vision. But these complications will have to be put aside and they do not disturb the line of argument.

³ See *VI* 195/149, where Merleau-Ponty speaks of ideas lining the sensible.

⁴ That Merleau-Ponty is serious about this point becomes especially clear in the institution lectures, where he writes that “the instituted has sense without me,” in the context of a discussion where time as “passivity-activity” is said to be the “very model of institution.” (Merleau-Ponty (2003a), 36; translations of this work, referenced below as *IP*, are from Merleau-Ponty (Forthcoming), which also gives the French pagination.) This means that I am not the wholly active constituter of sense, for the institution of sense requires an activity that surpasses me.

⁵ See especially the chapter “*Le sentir*” in *PhP*.

⁶ Merleau-Ponty writes at *OE* 31-32/167 that “[t]here really is inspiration and expiration of Being, respiration in Being, action and passion so slightly discernible that one no longer knows who sees and who is seen, who paints and who is painted”—but a slight discernibility of activity and passivity remains. And at *VI* 318/265 he writes that “Circularity [of] speaking-listening, seeing-being seen, perceiving-being perceived (it is because of it that it seems to us that perception forms itself *in the things themselves*)—*Activity=passivity*.” (Merleau-Ponty’s emphases) But the equal sign here does not remove the incongruence between activity and passivity, since the topic is reversibility as an “act with two faces.” In fact, the ability to indicate, with the equal sign, that activity and passivity are counterparts or equals precisely depends on the two maintaining separate faces. This separation of activity and passivity is central to Merleau-Ponty’s lectures on passivity, where the course summary opens with the observation that “the explication of perceptual experience must make us acquainted with a genus of being with regard to which the subject is not sovereign,

without yet the subject being inserted in it.” (*IP*, 267) Here he is broaching the need for an account of passivity as separate genus of being, that is not reducible to a lack of activity.

Also see the point from *VI* about the “fragmentation of being,” discussed in note 11 below. Hass (1999) interprets reversibility in terms of the relation between figure and ground that is so central to *PhP*, and the point here is that an incogruency between figure and ground is requisite to the central role of the figure-ground structure, and that passivity serves as ground for perception as active figuration.

Here we are touching on a crucial issue broached by Lawlor (2006) in his discussion of “mixturism” in Merleau-Ponty, namely whether Merleau-Ponty maintains a gap between mixed terms such as subject and object. This gap, Lawlor argues, is crucial to a philosophy of immanence. Contra Lawlor (although Lawlor is not unambiguous about this), the claim here is that Merleau-Ponty does maintain such a gap, although since there is an affiliation across the gap (but not an underlying unity or ambiguous being) Merleau-Ponty will have a different ontology than those of Foucault and Deleuze, with whom Lawlor is contrasting Merleau-Ponty.

For further discussion and argument that reversibility involves a reversible relation between activity and passivity, which does not, however, reduce the one to the other, see Morris (2008), Morris (Forthcoming).

⁷ Kant’s three writings on this topic (“On the First Ground of the Distinction of Regions in Space,” a passage from his inaugural dissertation, and a passage from the *Prolegomena to Any Future Metaphysics*) are collected in van Cleve and Frederick (1991), which also gives invaluable context as well as collecting recent discussions of

the issues broached by Kant. Casey (1997) links Kant’s incongruent counterparts to issues of the body and place that are highly pertinent to the discussion of oriented space below.

⁸ See Nerlich (1991), 151 for an important suggestion about conceptual usage, viz. that something can be an incongruent counterpart if and only if it actually has a counterpart (as being a twin entails actually having a twin), whereas something on its own can have the property of being an enantiomorph. I.e., incongruent counterparthood is a dyadic property, whereas enantiomorphism is monadic.

⁹ It is wrong to say that the operation inflects being *as* perceiver or perceived, as if being is a purely invisible substratum that *appears* in one of two visible forms. The right-hand glove turned inside out *is* a left-hand glove, not the appearance of a right-hand glove; and the left- and right- hand gloves are not the two visible appearances of some underlying, ambiguous being that would be purely invisible (a non-handed version of a handed glove is impossible to visualize). To say that the counterparts *seem* incongruent is not to say that they are really two *appearances* of the same thing, but that, despite their *own* looks, the one counterpart can turn to the other. This point is at work in a passage from *VI* on the reversed glove, discussed here on page 2. The ontology of reversibility and *écart* is not an ontology of appearance. This intersects with Merleau-Ponty’s ontological insistence on an invisible that is *of* the visible (see, e.g., *VI* 247/300-1), internal to the visible, not behind it.

¹⁰ See Cintas (2007).

¹¹ I came across this passage in searching through *VI* after an insight into the above links between reversibility, the glove and chirality. Further research reveals numerous

passages where Merleau-Ponty links reversibility to mirror images, discussed below. Also see VI 327/274, which notes that experience of my body as seer “announces the view that the other acquires of it or that the mirror gives of it,” like an enantiomorph itself pointing to its counterpart, in the manner of “double representation” in the glove.

¹² Being does so in the way that a curved Riemannian space internally indicates its curvature. The space’s curvature need not be measured in a higher order space, it can be sensed by traversing a triangle within the space and adding up its internal angles.

¹³ See the papers in van Cleve and Frederick (1991) for this issue.

¹⁴ Merleau-Ponty (2003b), 224.

¹⁵ See note 7.

¹⁶ Derrida (1981) demonstrates that meaningful difference in fact depends on a supplement that opens a shifting latitude of sense; *pharmakon* (the Greek term for drug, which can name both cure and poison, as in English), as reversing between cure and poison, exemplifies this latitude.

¹⁷ See Pályi, Zucchi and Cagliotti (1999) and Marsh and Bock (1991) for collections of relatively recent work surveying the topics of chirality, homochirality and asymmetry in biology and biochemistry.

¹⁸ Quoted in Gardner (1979), 98.

¹⁹ Bergson ([1907] 1998), 16, italics in original.

²⁰ See Nagata (1999).

²¹ Properly: levo and dextro form, that is L-amino acids and D-sugars.

²² Gilat (1999).

²³ Neville (1976), chapter 1. Our bodies are thus “pseudosymmetrical.”

²⁴ Levin (2005), 5.

²⁵ See Neville (1976).

²⁶ Levin (1999), 140-1.

²⁷ See, e.g., Aristotle (2001).

²⁸ In *PhP* this inseparability first of all has to do with *our* directedness toward being, *être au monde*—but it also involves the directedness of the phenomenal field. In later work *sens* more clearly depends on a directedness of being itself, kin to the directedness of the phenomenal field. This especially apparent in Merleau-Ponty (2003a), which revives the field concept.

²⁹ See, e.g., Mezey (1999), but see Mason (1991) for an earlier and different opinion that also links homochirality to a bias of the universe. Gardner (1979) draws an even earlier version of this connection.

³⁰ Levin (1999), 137.

³¹ Levin (2005), 6. Also see Brown, McCarthy and Wolpert (1991), whose model is referenced by Levin, and proposes that the internal establishment of asymmetry direction depends on a handed—but as yet unknown—molecule, named “F” (because the letter is handed). Levin’s point is that it would still be necessary to ask how the direction of F’s asymmetry is established.

³² The variant is known as the “Ozma problem,” which name comes from Gardner’s appropriation of the name of a contemporary project that was searching for signs of extra-terrestrial intelligence. The problem is articulated in chapter 18 of Gardner (1979), which is also an extremely helpful introduction to all the problems about asymmetry and mirror sense discussed below. This chapter of Gardner’s is also included in van Cleve and Frederick (1991), which includes extensive discussion of Gardner’s problem in relation to Kant.

³³ The problem of establishment here is really the problem of institution in *IP*.

³⁴ Lyre (2008) is very helpful in emphasizing this point, i.e., that the problem is not communicating a difference between left and right, but establishing which of a chiral pair is the left one. Lyre also gives a more abstract analysis of the problem by showing how we can communicate “up” and “front” by having the aliens construct dice and label the faces according to mathematical constraints (that opposite faces add up to 7), and then telling them about relations between various faces. But these constraints leave ambiguous the difference between left and right, i.e. there are two ways of arranging the die faces so that opposite faces total 7. Modern dice are all, by convention, left-handed (but note that calling them this is itself a convention). But there is no guarantee that the aliens would put together left-handed dice which could then show them which side is left. See Gardner (1979), 31-2 for the account of the chirality of dice.

³⁵ For an extensive treatment of this issue, see the works collected in van Cleve and Frederick (1991), which includes the relevant works by Kant as well as Gardner, and commentary. Of these, Bennett (1991) develops the helpful tell vs. show distinction.

³⁶ Indeed this means that the problem of chiral sense intersects with the problem of defining what chirality or this problem means in the first place, a point notable in the literature collected in van Cleve and Frederick (1991), which is constantly caught in deeply conceptual and slippery matters.

³⁷ For these points, see the various works in van Cleve and Frederick (1991), of which Gardner’s piece and Nerlich (1991) are especially helpful. For a delightful but

challenging introduction to topology and notions such as non-orientable spaces, see Weeks (2002).

³⁸ That is, a god above all perspective, could know that there is a difference between left and right, but not which hand is which. Interestingly, children also do not seem to see shapes in the same way as adults—they see their topological connectedness more than their figure—and this may be correlative to their inability to tell left hand figures from right.

³⁹ [Identifyin information removed.]

⁴⁰ Blakemore (2003), Blakemore, Bristow, Bird, Frith and Ward (2005)

⁴¹ Armel and Ramachandran (2003), Botvinick (2004), Botvinick and Cohen (1998), Ehrsson, Holmes and Passingham (2005), Gallagher (2004).

⁴² Sebanz, Bekkering and Knoblich (2006).

⁴³ Merleau-Ponty ([1941] 1965).

⁴⁴ Here we see the link between sense, geometry, institution, writing down, activity and passivity, i.e. between the projects of Merleau-Ponty (2003a) and Merleau-Ponty (2002). See Lawlor (2002) for an orientation to these issues. Likely Derrida’s work on the genesis of sense in Husserl becomes relevant at this point.

⁴⁵ See Newton ([1687] 1999); this edition has an especially helpful scholarly apparatus.

⁴⁶ Here there is a link to the crucial theme of expression in Merleau-Ponty.

⁴⁷ Soderbergh (2007).

⁴⁸ There is an obvious complication here methodological, as to how we can introduce this empirical datum from the everyday attitude into a transcendently reduced phenomenological attitude, but likely we can take care of that by noting that it is precisely

the everyday sense “exactly manufactured dies” that is being bracketed, and that it is this sense that we are trying to describe as phenomenologists. This leads to the interesting point that another reason why the die is apt as example is because its everyday sense includes the sense of a community, exactness, objectivity, and so on. The sense of it as “exactly manufactured die” is reciprocal with the sense of the community through which alone exactness, objectivity, etc., can have a sense.

⁴⁹ I am articulating these points with Husserl ([1931] 1991) in mind. On the die’s reference to the community, see note 48.

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⁵⁰ For these issues of sense genesis in Husserl, see “The Origin of Geometry” in Husserl (1970) and also Husserl (1998). Merleau-Ponty (2002) gives an extensive study of this problem in Husserl, and Lawlor (2002) gives an excellent introduction to and context for this issue in its relation to the “creative operation.” Sense genesis is also central to Merleau-Ponty (2003a). Also see Derrida (1989).

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