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Hegel and the Becoming of Essence

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In the *Science of Logic*, Hegel derives essence from being. How precisely does this come about? This is an extraordinarily difficult moment in the interpretation of Hegel's logic. I have found only one essay on the subject. According to Professor Michael Baur:

Thought finds itself condemned to a perennial and arbitrary interplay of qualitative and quantitative alterations which lack any stable substance or truth of their own. In order to overcome this bad infinite regress, one cannot appeal to yet another kind of external determination, for the mere appeal to another determination as such can only perpetuate the infinite regress. The problem can be overcome only when one succeeds in articulating a kind of relation which is not a relation to Other at all, but rather a kind of self-relation. That is, once the sphere of Being has shown itself in its nullity, one must enter a sphere where all transition is no transition at all.¹

This is a very nice summary, but it is performed at a very high level of generality. Where in this summary is any reference to the mystifying terms one finds in the chapter Hegel entitles "The Becoming of Essence" (*Das Werden des Wesens*)? There, one encounters "the infinite which is for itself" (*fürsichseiende Unendliche*)² and inverse ratio of the factors (*umgekehrtes Verhältnis ihrer Faktoren*). What do these concepts mean? Furthermore, Hegel insists that an outmoded theory of planetary orbit—the alternation of centripetal and centrifugal force—somehow illustrates the sublation of quality and quantity and the becoming of essence. How does bad astronomy relate to the becoming of essence? Why, when Hegel *knows* centripetal and centrifugal force to be bad astronomy, does he invoke it?

Hegel's logic is a circular chain of necessary moves. If the chain is broken anywhere, the *Science of Logic* is invalidated and may as well be chucked out the window. Every link of the chain must therefore be inspected for weakness.

My intent in this paper is to examine the exact derivation of essence in the last part of Hegel's analysis of measure. The obscure link in the chain between measure and essence is, in my opinion, a valid one. If Hegel's logic fails, it doesn't fail here. It is possible to endorse the path toward essence through the infinite-for-itself and the inverse ratio of the factors. In the interest of demonstrating how these concepts work, I will first make a few points—quite familiar to veterans of Hegelian logic—about Hegel's method and how it proceeds. Second, I will bring the reader up to speed on the general dynamic of measure—the last subdivision in the realm of being and postern gate to the shadowy realm of essence. Third, I will slow down the discussion to examine the final parts of Hegel's middle chapter on measure—real measure. It is here that the sublation of quality and quantity begins to manifest itself. Finally, I examine the troika of absolute indifference, inverse ratio and that brass ring, essence itself. In these steps essence finally *becomes*. And in the course of this examination, I will try to show why Hegel invokes astronomical theory he knew very well to be decadent. This will allow us to pinpoint the moment when the realm of being yields the ghost in favor of the realm of essence.

¹ Michael Baur, *Sublating Kant and the Old Metaphysics: A Reading of the Transition from Being to Essence in Hegel's Logic*, 29 OWL OF MINERVA 139, 146 (1998). I suppose I should also mention David Gray Carlson, *Hegel's Theory of Measure*, 25 CARDOZO L. REV. 129 (2003). Unfortunately, I find, soon after publishing this work, that my interpretation is in need of refinement. As I proceed, I will draw attention to what was missing from this earlier account.

² G.W.F. HEGEL, HEGEL'S SCIENCE OF LOGIC 371 (A.V. Miller trans. 1969) (SL); 1 G.W.F. HEGEL, WISSENSCHAFT DER LOGIK 384 (Georg Lasson ed., 1975) (WL).

I. Hegel's Logical Method

The prose in Hegel's *Science of Logic* is sibylline, and, in its interpretation, it is always useful to cleave to the fundamentals of Hegel's method. Often Hegel's sentences become clear only when one recalls the exact methodological point one is at.³

Hegel's logical method, as everyone knows, proceeds in a triune way. First, the "understanding" makes a one-sided proposition about the absolute, given previous derivations that have previously accrued. Its affirmative propositions, however, always leave something out as it tries to account for all prior logical progress. The understanding therefore *forgets*.

Dialectical reason *remembers*. It reproaches the understanding for suppressing previously established steps in the interest of making a non-contradictory proposition of the logical progress.⁴ But dialectical reason ends up merely replicating the one-sided error of the understanding. By affirmatively proposing what the understanding has suppressed, dialectical reason itself suppresses what the understanding has validly discovered.

Speculative reason intervenes to show that the *difference* between the understanding and dialectical reason is what they have in common—negation of the other. In the speculative step, the two extremes of a syllogism reveal their fundamental negativity. Each side is *not* the other. But each side *is* the other. So each side negates itself in negating its other. The sides send their being into a third. This negative surplus is a gain over the prior steps. This surplus justifies the adjective "speculative," in its economic connotation of return on investment.

These three steps repeat themselves over and over until the Logic ends. But as the Logic progresses, the understanding becomes more sophisticated. It makes *affirmative* propositions at first, but it learns to make dialectical propositions in the realm of essence.⁵ Indeed, in "The Becoming of Essence," we shall see its newly won dialectical nature already on display. At the end of essence, the understanding abandons its "negative" correlative point of view and learns to make notional or speculative propositions in the subjective logic. Rather than doubled, proposition becomes triune. The story of the *Science of Logic* is how the understanding *becomes* speculative reason in the end, and how method merges with the very material to which it is applied.

The triune structure repeats itself at the macro-logical level as well as the micro-logical level. The interpreter should expect that the first chapter of, say, measure is relatively *immediate* in its form. The second chapter is dialectical. It constitutes a splitting of the unified premise of the prior chapter. The third chapter resolves the contradiction of the second chapter and unifies the opposites. This pattern may replicate itself many times *within* chapters as well.

Measure itself is *third* to quality and quantity. It is therefore generally speculative compared to its predecessors. Yet measure itself splits in two, leading to the dialectical Doctrine of essence, where reflection is paired with sublated being (*i.e.*, appearance). With this methodology in mind, we approach the becoming of essence through the logic of measure.

³ See David Lamb, *Teleology: Kant and Hegel*, in HEGEL'S CRITIQUE OF KANT 173, 175 (Stephen Priest ed., 1987) ("When reading Hegel one must be like a detective and search for clues, for Hegel does not leave the reader with any familiar objects") (footnote omitted).

⁴ It has been suggested that dialectical reason equates with *experience*. That is, the understanding has made a proposal about the universe. By remembering the past dialectical reason inverts the proposition and reveals it to be the opposite of what it is supposed to be. Dialectical reason is like experience in that "theory" is shown to be inconsistent with the "real" world known to exist beyond theory. KENNETH R. WESTPHAL, HEGEL'S EPISTEMOLOGICAL REALISM: A STUDY OF THE AIM AND METHOD OF HEGEL'S *Phenomenology of Spirit* 130 (1989); G.W.F. HEGEL, THE JENA SYSTEM, 1804-5: LOGIC AND METAPHYSICS 53 (John W. Burbidge & George di Giovanni trans. 1986) ("experience, of course, is the conjoining of concept and appearance—that is, the setting in motion of indifferent substances, sensations, or whatever you will, whereby they become determinate, existing only in the antithesis").

⁵ See *Science of Logic*, *supra* note 2, at 384 ("The being of the determinations is no longer simply *affirmative* as in the entire sphere of being, but is now a sheer *positedness*, the determinations having the fixed character and significance of being *related* to their unity"); 2 WL, *supra* note 2, at 398 ("Sie sind statt Seiender wie in der ganzen Sphäre des Seins nunmehr schlechthin nur als Gesetzte, schlechthin mit der Bestimmung und Bedeutung, auf ihre Einheit").

II. Measure in General

Measure is the unity of quality and quantity. But what is quality and what is quantity? These protean concepts constantly evolve across the *Science of Logic*. In the beginning, quality was supposed to be what affirmatively *is*, but what *is* requires contrast with what *is not*. What *is not* is the *limit* to what *is*. Limit is necessary to the affirmativity of the thing, but limit is imposed from the outside; quality is *constituted* by its other and is the opposite of the affirmative thing it was supposed to be. Quality is truly "for itself" when it reveals that it is completely for the other that constitutes it. This state of shedding its being to the outside Hegel names the true infinite--his singular contribution to philosophy. The true infinite *remains* what it is while becoming something other. When quality posits that its content is in an other, it is *quantity*. Quantity, a true infinite, has *discreteness* but also *continuity* into its other.

How is it that quantity signals being-for-other? Why does he view quantity as entirely constituted? For Hegel, there is *magnitude* in general--a *quality* which is divisible into units that continue into each other. Magnitude does not have life on its own. A mathematician must divide it up. She *chooses* to isolate two units and combine them with two identical units to arrive at four units.⁶ This openness of magnitude to the will of the mathematician is the essence of quantity.⁷ Quantity is *for another* and not for itself. Yet quantity is also a true infinite. It stays what it is *and* becomes something other. Its *Bestehen* is its quality. So Hegel writes of the *quality* of quantum.

The quality found in quantum is *resistance* to externality. It begins to appear in the concept of the Infinitely Great or Small--unnameable quantities unfixable by the will of the mathematician. It suits our purpose, however, to examine the quality of quantum as it appears in the inverse ratio--quantity's swan song before the advent of measure. To illustrate this stage, take the formula $xy = 16$. In this expression, so long as 16 stays fixed, an increase in x leads to a decrease in y . The variables x and y are quite open to external manipulation by the mathematician. But there is a limit to the mathematician's power over x and y . The mathematician cannot make either x or y into zero. This resistance is important in re-establishing quality as integral to quantity. Quality stands for *resilience* and *resistance* to change.

Measure is the unity between external quantity and internal quality. It begins as an *immediate* unity--measure as specific quantity. So conceived, measure is a quantity of a quality, but, if the unity is immediate, the slightest change of quantum produces a different quality and so a different measure. At first measure is brittle.

Yet quality, at this stage, has proved to be an immunity from outside determination:

As a quantum [measure] is an indifferent magnitude open to external determination and capable of increase and decrease. But as a measure it is also distinguished from itself as a quantum, as such an indifferent determination, and is a limitation of that indifferent fluctuation about a limit.⁸

In other words, measure is not *just* a quantum, open to externally caused increase and decrease. It is also a quality immune from quantitative change. Quality *survives* a change in quantum. Every measure must have some give to it--this *is* its quality. Measure is no longer so brittle. But neither is it immune from change, since quantity stands for changeability. There must be a range of immunity from change which is nevertheless open to change: "the quantitative determinateness of anything is thus twofold--namely, it is that to which the quality is tied and also that which can be varied without

⁶ For this reason, arithmetic is analytic, not synthetic, according to Hegel. SL, *supra* note 2, at 789; 2 WL, *supra* note 2, at 445.

⁷ Not only must a mathematician divide up magnitude into sets of units, but a given unit *itself* is *constituted* by subjective will. As proof, consider that every integer can, by legitimate mathematical procedure, be reduced to an infinite series. For instance, $2=1/(1-a)$ can be expressed as $2=1+a+a_2+a_3 \dots a_n$. Where $a=0.5$, this last expression approaches but never reaches 2. The integer 2 is therefore the product of the mathematician subjectively wishing to "fill in" the absence represented by the ellipsis. The common sense aphorism that figures don't lie is itself a lie. For Hegel, constitution (*Beschaffenheit*) represents the inability of an object to complete itself. David Gray Carlson, *Hegel's Theory of Quantity*, 23 CARDOZO L. REV. 2027, 2027-29 (2002).

⁸ SL, *supra* note 2, at 334; 1 WL, *supra* note 2, at 344 ("Als Quantum ist es gleichgültige Größe, äußerlicher Bestimmung offen und des Auf- und Abgehens am Mehr und Weniger fähig. Aber als Maß ist es zugleich von sich selbst als Quantum, als solcher gleichgültigen Bestimmung, verscheiden und eine Beschränkung jenes gleichgültigen Hin- und Hergehens an einer Grenze.").

affecting the quality."⁹ This is the stage of specifying measure.

In specifying measure, every measure has a *rule*—a range of quantitative variation within which quality does *not* change. For liquid H₂O, its rule would be between 0° and 100° centigrade. Rule is conceived as external to the matter it rules. Yet the specified measure—the "ruled matter"—has a quality, which is indifferent to outside determination.

To illustrate rule and its effect on the specified measure, take the case of a baby with a fever. The thermometer represents the rule—anything between 37-39° centigrade is a "normal" temperature. Anything higher is a fever. The baby represents the thing measured. Both the thermometer and the baby have their unique quality and quantity and so two measures face each other. The imposition of rule on the ruled—the thermometer on the child—produces a third thing: the ratio between these two measures. Or, more colloquially, the baby heats up the thermometer but it is equally true that the thermometer cools down the baby. The reported temperature is not strictly speaking the baby's quantum or the thermometer's quantum but is a compromise between the quanta of the baby and the thermometer. All measures are therefore ratios of two other measures. And every measure has something which escapes externalization. Measure has now divided into two. This is the realm of real measure.

If specific quantity (measure's first chapter) stands for the immediate one-sided view of the understanding, real measure stands for dialectical reasoning. Two measures now produce a third.

The specified measure is at first indifferent to the specifying measure. For example, the specific gravity of gold is 19.3. Specific gravity of gold is the ratio of (a) the density of gold to (b) the density of pure water at its maximum density at 4° C, when both densities are obtained by weighing the substances in air. But gold is indifferent as to whether it is measured against water or measured against some other material. Because gold could have been measured against mercury or fine bordeaux, gold has a *series* of quanta. Properly, gold is all of these quanta. This implies that every measure is a *metonym*. One never measures a thing directly; one rather gathers together a series of measures which surround a thing. A thing is finally measured only when *all* its ratios of measure are present. When specified measure is reduced to series of measures, we begin to see quality and quantity in the process of sublation. In the middle of the series of measures is a master mediating signifier that organizes everything.

III. The Sublation of Quality and Quantity

By the end of measure's second chapter, we have learned that what every measured thing has in common is serial being—the ability to be compared to any other serial being but nevertheless a resistance to being *completely* captured in measure. This seriality Hegel names *elective affinity* (*Wahlverwandtschaft*). The heart of measure is now abstract *neutrality*—a thing is defined by what neutralizes it. The thing is revealing itself to be a metonym. It cannot define itself. It can only reveal what it is by interacting with external things, which are ultimately themselves metonyms.

The understanding proposes that affinity is continuity; metonymic things are continuous into their external measures. But dialectical reason protests that affinity is only half the story; something eludes the elective affinities—an empty center that organizes them. This empty center Hegel names substrate. The substrate is *discontinuous* with the series of measures *and* continuous at the same time.

⁹ SL, *supra* note 2, at 334; 1 WL, *supra* note 2, at 344 ("die Quantitätsbestimmtheit so an dem Dasein die gedoppelte ist, das eine Mal die, an welche die Qualität gebunden ist, das andere Mal aber die, an der unbeschadet jener hin- und hergegangen werden kann") Hegel summarizes this opening move succinctly in the *Encyclopedia Logic*:

In so far as . . . quality and quantity are only in *immediate* unity, to that extent their difference [is] equally immediate. Two cases are then possible. Either the specific quantum or measure is a bare quantum, and the definite being (there-and-then) is capable of an increase or a diminution, without Measure (which to that extent is a *Rule*) being thereby set completely aside. Or the alteration of the quantum is also an alteration of the quality.

The thing, after all, is by now a veteran true infinite. It stays what is while becoming something other. So when a thing is measured and measured again, it becomes something external and visible. Yet it stays what it is. There is something beyond the series of measures.

Measure has again split in two. Before there were two measures producing a neutrality. Now we have a different pairing. There is substrate, which is the *beyond* of measure. And there is the *totality* of measure on the other.¹⁰ On the side of measure, continuity and discontinuity are joined in the "nodal line" (*Knotenlinie*). "Nodal line" invokes the image of a rope with knots in it. In between the knots movement up and down the line represents ineffectual quantitative change. To leap over a node represents a qualitative change. The nodal line is illustrated by steam-liquid-ice. Between the nodes of ice and steam, quantitative change can occur without qualitative change in the liquid quality of water. But if the temperature is pushed below 0° C or above 100°, radical qualitative change occurs—all at once. None of this has anything to do with the Substrate (H₂O), however.

Why must the side of measure be divided into a nodal line? This is the inheritance from immediate measure (specific quantity) and rule. Specific quantity meant that quality can be destroyed by quantitative change. Rule meant that every quality had a range of indifference to quantitative change. These concepts imply that the substrate can be organized into a series of measures that validly report its *state*. On the side of measure, quantitative change leads to qualitative change—a change in the "state" of the thing. Thus, a unit of some acid may take two units of *this* alkali to neutralize it or three of *that* alkali; the *quality* of the acid is its quantitative relation to the alkali. Yet if any of the alkali is actually added to the acid, the acid undergoes a qualitative change; it is no longer acid but a neutral product. But the acid's substrate remains what it is regardless of how an external measurer, capable of inflicting change, drives the thing up and down its nodal line of possible qualitative changes. "Thus there is posited the alternation of specific existences with one another and of these equally with relations remaining merely quantitative—and so on *ad infinitum*."¹¹

This leads the understanding to propose the substrate is the abstract measureless. Measure, as nodal line, stands over against it. Whatever happens on the nodal line side is of no concern to the substrate. Therefore, Hegel says the nodal line has become purely quantitative vis-a-vis the substrate. That is to say, whatever happens on the nodal line does not change the substrate. The substrate is now immune from qualitative change. All measures of the substrate are strictly quantitative, which is to say indifferently and externally imposed. This is the understanding's proposition about the abstract measureless.

What is important to see at this point is that measure is entailed in a duality between the nodal relation of quantity and quality, on the one side, and substrate, on the other. The first side is measure as such—quantity and quality. The second side is something deeper than quantity and quality—the substrate.¹²

The dialectical critique of this position consists in confronting the understanding with what it

¹⁰ The importance of the totality of measures, which are *completely present*, eluded me in my earlier essay on measure. Carlson, *supra* note 2.

¹¹ SL, *supra* note 2, at 334; 1 WL, *supra* note 2, at 385 ("so ist die Abwechslung von spezifischen Existenzmzren miteinander und derselben ebenso mit bloß quantitativ bleibenden Verhältnissen gesetzt,—so fort ins Unendliche").

¹² John Burbidge, who has written an entire book on these transitions, provides a different account. He seems to view the nodal line as giving rise to absolutely discontinuous qualities, conceived as distinct neutral compounds. JOHN W. BURBIDGE, *REAL PROCESS: HOW LOGIC AND CHEMISTRY COMBINE IN HEGEL'S PHILOSOPHY OF NATURE* 47 (1996). This is true so far as it goes, but this leaves out the whole notion of substrate, which stands over from and is immune from (yet related to) the nodal line. Burbidge writes:

Since there is no qualitative boundary the two [neutral com-pounds] share—at least to the extent that thought can anticipate it—they are simply external to each other. So we are far removed from even a minimal account that would enable us to understand the relation. From this perspective no explanation is possible. We cannot conceive what is involved; it is immeasurable.

Id. (footnote omitted). Thus, for Burbidge, what is immeasurable is qualitative change. *Id.* at 48 ("The transformation of one quality into another is defined as immeasurable"). This seems to me off point. There is nothing inconceivable about the measureless. It represents the substrate which is immune from qualitative change through quantitative manipulation. It does not represent a property of qualitative transformations.

has left out. Since the nodal line is measure, and since measure is both quality and quantity, the nodal line is itself qualitative. That is to say, there is a qualitative *difference* between measure and substrate. Two indifferent qualities now face each other.

The speculative critique of the prior two positions emphasizes the negativity which they share. The nodal line is *not* qualitative, according to the understanding, but is rather continuous with the substrate. The nodal line *is* qualitative and therefore *not* quantitative and continuous, according to dialectical reason. The speculative position is that the measureless is *neither* qualitative nor quantitative. This is the measureless in its concrete form. Hegel gives this speculative conclusion the name infinite-for-itself.

I said earlier that speculative reason consists in the sides of a syllogism exhibiting self-negativity. That is precisely what we have in the infinite-for-itself. The two sides of the infinite-for-itself are neither qualitative nor quantitative. Quality and quantity are *for other*. They represent the mere *appearance* of things. The Infinite is now "*for itself*," not for other. Being-for-self was the stage in which being expelled all its content to become quantity. In effect, Measure is now exhibiting its being-for-self. It has expelled its content into the substrate. But the opposite is also true. The substrate has expelled its being into measure. There is always a double movement in measure between the measured thing and its specifying measures.¹³ The nodal line both *is* and *is not* the substrate.

We now reach the final moves in measure—the moves that constitute "The Becoming of Essence." This is an exceptionally mysterious chapter, and so our progress must be slow and careful.

IV. The Becoming of Essence

A. Absolute Indifference

The understanding progressively learns as it proceeds. Its immediate proposition is now decidedly dialectic in shape. Its initial proposition about the infinite-for-itself is that the substrate is *absolutely indifferent* yet *connected* to measure.

The *absolute* indifference (*Gleichgültigkeit*) of substrate to measure is different from and more developed than mere *abstract* indifference. The absolute indifference of the substrate is "the indifference which, *through the negation* of every determinateness of being, i.e., of quality, quantity, and their at first immediate unity, measure, is a process of *self-mediation* resulting in a simple unity."¹⁴

Yet there is present here a certain contradiction. Quality is supposed to have been the *internal* indifference of a thing to externally imposed quantitative change. Quality was that which lived beyond the quantum of measure. But now quality itself is external to substrate: "quality as thus external to being is the opposite of itself and as such is only the sublation of itself."¹⁵

The understanding sees that substrate is not *just* indifferent to the nodal line. It likewise has its being there. This is part and parcel of the understanding's proposition about the infinite-for-itself. "[T]he indivisible self-subsistent measure" is "*wholly* present in its differentiations."¹⁶ For this reason, absolute indifference is "concrete, a mediation-with-self through the negation of every determination of being."¹⁷ The understanding, then, has made a *dialectical* proposition about absolute indifference, an important event in the *Bildungsroman* of Absolute Idea.

¹³ This doubleness of movement was discovered later by Hegel and appears only in the 1831 revision of the *Science of Logic*. Cinzia Ferrini, *Framing Hypotheses: Numbers in Nature and the Logic of Measure in the Development of Hegel's System*, in *HEGEL AND THE PHILOSOPHY OF NATURE* 283 (Stephen Houlgate ed., 1998).

¹⁴ SL, *supra* note 2, at 375; 1 WL, *supra* note 2, at 388 ("die durch die Negation aller Bestimmtheiten des Seins, der Qualität und Quantität und deren zunächst unmittelbarer Einheit, des Maßes, sich mit sich zur einfachen Einheit vermittelt").

¹⁵ SL, *supra* note 2, at 375; 1 WL, *supra* note 2, at I:388 ("als so äußerlich gegen das Sein ist das Qualitative als das Gegenteil seiner selbst nur das such Aufhebende").

¹⁶ SL, *supra* note 2, at 376; 1 WL, *supra* note 2, at 388 ("das untrennbare Selbständige, das in seinen Unterschieden ganz vorhanden ist").

¹⁷ SL, *supra* note 2, at 375; 1 WL, *supra* note 2, at 388 ("das Konkrete, das in ihm selbst durch die Negation aller Bestimmungen des Seins mit sich Vermittelte").

B. Inverse Ratio of the Factors

In absolute indifference of the substrate, the understanding proposed that a thing is a sameness that has difference within it—the difference between substrate and measure. Dialectical reason reverses the proposition. It proposes that a thing is a difference which is the same. In other words, according to dialectical reason, there is nothing in the substrate which is not *entirely* present in its measure. This is the mysterious step that Hegel calls the inverse ratio of the factors.

We have already seen that inverse ratio is a term important in the transition from quantity to measure. An example of inverse ratio was $xy = 16$. If 16 stays fixed, the variables x and y have a moment of immunity from external manipulation by the mathematician; they have a variable inverse relation, but neither could x nor y can be made equal to zero.

In the primitive inverse ratio, the product—16—stays fixed, through the will of the mathematician. This fixity represents Quantum's dependence on outside external reflection to determine what it is. Now, at our more advanced stage, the fixed product has become a "fixed measure."¹⁸ Recall that every measure is in fact a *series* of measures. A thing is not really measured until the *totality of measures* is present. And yet a substrate exists apart from this totality. Hegel's *fixed measure* is therefore the totality of the realm of being. This is substrate's limit. Likewise, substrate is the beyond of the totality of measures. The fixed measure has become an absolute indifference to measure and hence immunity from the external will of any mathematician or measurer. Hegel describes the difference between the *primitive* and *more advanced* inverse ratios as follows: "here the whole is a real substrate and each of the two sides is posited as having to be itself *in principle* [*an sich*] this whole."¹⁹ In other words, substrate *is* its nodal line. So the sides are the whole and the whole are the sides.

Why is measure now an *inverse* ratio? The point here is ultimately simple. Measure is fixed. The entire series of measures is deemed present and accounted for in the nodal line. It may seem at first that the series of measures are infinite in number and therefore incapable of completion, but that is not so. Metonyms inherently refer to *context*—a completed idea. Completion is the key to the logic of the inverse ratio of factors. So, conceptually, *every* series is now present, even though, empirically, we could never gather together all the measures needed to exhaust a thing's serial being. Each side—nodal line and substrate—purports to be the *whole thing and its organizing other*. Now recall that quantitativity stands for openness to external manipulation by a measurer. So if the inverse ratio of the factors is the whole thing, a measurer can only add an extra measure by embezzling from the whole a comparable quality and quantity and then presenting it as if it were something new. This is one sense in which the factors are in an *inverse* relation. Something new correlates with something abstracted from the old. But if we insist the whole stay the whole *in spite* of this externality, then what the measurer adds is a *surplus*.

It is this surplus that proves the undoing of the realm of being. The fixed measure is simply beyond the influence of an external reflection. In this sense, the passage quoted earlier from Michael Baur's essay is correct.²⁰ Any added measure is a meaningless surplus that cannot add to our knowledge of the thing. Furthermore, consider that measure has by now self-destructed already. It turned out to be a third to specified and specifying measure—a *neutrality* which turned out to be a metonymic empty center. So the surplus measure which the measurer attempts to add to the inverse ratio of factors has *already* wafted away on its own logic, and what remains is utterly beyond (yet internal to) the realm of measure and of being generally. What is sublated is *externality*—the susceptibility to external constitution.

The sides of the inverse ratio of the factors are quantitative and continuous, but they are still presented as different; each is a quality. Suppose one side puts itself forth as a *quality*. Hegel suggests that the other side must surrender its quality and be merely quantitative. The point is that two qualities

¹⁸ SL, *supra* note 2, at 376; 1 WL, *supra* note 2, at 389 ("feste Maß").

¹⁹ SL, *supra* note 2, at 376; 1 WL, *supra* note 2, at ("daß hier das Ganze ein reales Substrat, und jede der beiden Seiten gesetzt ist, selbst an sich dies Ganze sein zu sollen").

²⁰ See *supra* text accompanying note 1.

meet each other as "mere oppugnancies," in Shakespearean terms.²¹ One must strike the other down. Thus, of the two qualities, Hegel says that "one of [them] is sublated by the other."²² But they are unified in a ratio nevertheless. And, Hegel further says, "neither is separable from the other."²³ So the assertion of one quality at the expense of the other is a useless endeavor. Furthermore, which side is quality and which quantity? The totality, which is both the world of appearance and the substrate that organizes it, is indifferent. The totality is immune from anything the external measurer can impose upon it.

C. Transition into Essence

Why is absolute indifference and its obverse, the inverse ratio, not yet essence? Hegel speaks of three deficiencies in the pre-essence stages of absolute indifference and inverse ratio. The first of these faults is that the determinate being of the substrate is "groundlessly emerging in it."²⁴ That is to say, the substrate still displays a moment of logical *unconnectedness* to its nodal line. No *self*-repulsion is on display, as it will be in essence. This is the *qualitative* fault of the pre-essence stages—the fault of absolute indifference.

Second, external reflection can assign to the substrate the role of quality or quantity to its other, in which case the other is quantity or quality respectively. This modulation back and forth shows that difference between the sides is imposed externally, whereas essence must be in *and for* itself. This is the *quantitative* fault of the pre-essence stages—that each side can be determined as quality or quantity.

Third, since the sides can be assigned a qualitative or quantitative role, the sides are *themselves* in an inverse relationship. One side is indifferently quality or quantity. This implies that each side is inherently already *both* quality and quantity. "Hence each side is in its own self the totality of the indifference."²⁵ Each side therefore contains an opposition. This is the speculative fault of the pre-essence stage.

Because each side is the totality, each side can no longer go outside itself. To go into the other is only to go into itself. The pre-essence stages have now passed beyond quantity, which by definition always goes *beyond* itself. Going into the beyond (transition) has now gone into the beyond. Yet if there is no quantity, there can be no quality. Each side becomes nothing *but* quality. Quality as isolated is pure being. Pure being is pure nothing, and so quality too sublates itself.

The one further step that must be taken "is to grasp that the reflection of the differences into their unity is not merely the product of the *external* reflection of the subjective thinker, but that it is the very nature of the differences of this unity to sublata themselves."²⁶

Hegel identifies the unity of the existential differences (or essence) as "absolute negativity."²⁷ This negativity is a truly radical indifference. It is an indifference to being, which is therefore an indifference to itself, and even an indifference "to its own indifference."²⁸ Essence repulses itself from itself. It is an active principle, in the nature of Pure quantity. Indeed, at the beginning of essence, Hegel will confirm that, "[i]n the *whole* of logic, essence occupies the same place as quantity does in the sphere of being; absolute indifference to limit."²⁹ Essence is therefore a return to quantity, but in an enriched form—a form which never leaves itself as it repels itself from itself. Quantity, in contrast, had a definite *beyond* into which it continued.

²¹ WILLIAM SHAKESPEARE, *TROILUS AND CRESSIDA* Act 1 Scene 3.

²² SL, *supra* note 2, at 376; 1 WL, *supra* note 2, at 389 ("als in deren durch die andere aufgehoben").

²³ SL, *supra* note 2, at 376; 1 WL, *supra* note 2, at 389 ("von der andern untrennbar ist").

²⁴ SL, *supra* note 2, at 377; 1 WL, *supra* note 2, at 390 ("grundlos an ihr hervortretend").

²⁵ SL, *supra* note 2, at 378; 1 WL, *supra* note 2, at 397 ("So ist jede Seite an ihr die Totalität der Indifferenz").

²⁶ SL, *supra* note 2, at 384; 1 WL, *supra* note 2, at 397 ("Was hier noch fehlt, besteht darin, daß diese Reflexion nicht die äußere Reflexion des denkenden, subjektiven Bewußtseins, sondern die eigene Bestimmung der Unterschiede jener Einheit sei, sich aufzuheben").

²⁷ SL, *supra* note 2, at 384; 1 WL, *supra* note 2, at 397 ("absolute Negativität").

²⁸ SL, *supra* note 2, at 384; 1 WL, *supra* note 2, at 397 ("gegen ihre eigene Gleichgültigkeit").

²⁹ SL, *supra* note 2, at 391; 2 WL, *supra* note 2, at 5 ("Das Wesen ist im Ganzen das, was die Quantität in der Sphäre des Seins war; die absolute Gleichgültigkeit gegen die Grenze").

The determination of absolute indifference was "from every aspect a contradiction."³⁰ First, it is "*in itself* the totality in which every determination of being is sublated and contained."³¹ Yet it asserts the inverse ratio of the factors as an externality.

As thus the contradiction of itself and its determinedness, . . . it is the negative totality whose determinatenesses have sublated themselves in themselves and in so doing have sublated this fundamental one-sidedness of theirs The result is that indifference is now posited as what it in fact is, namely a simple and infinite, negative relation-to-self.³²

That essence is simple is the contribution of the understanding, when it proposed that the substrate and the nodal line were one and the same. That it is infinite is to say that Substrate goes outside of itself but remains what it is (though, now that externality has been abolished, "outside" must be understood as really inside).³³ As such, the substrate is essence.

What is the fate of expelled being? These *dejecta* "do not emerge as self-subsistent or external determinations."³⁴ They are borne by and retained as ideal moments of the essential thing. Furthermore, these materials "*are* only through their repulsion from themselves."³⁵ In other words, appearances are authentic to the essence of the thing. But they are not what they are affirmatively. This is the now superseded error of the understanding. Rather, these beings are "*sheer positedness*."³⁶ A positedness, in the realm of essence, will be what determinateness was in the realm of being. It is a relation between the affirmative and the negative, with the understanding that affirmations are really negations of the negation invoked by essence.

Being has now abolished itself. And in this self-banishment, the presupposition with which the entire Logic began has sublated itself. Being turns out to be "only a moment of [essence's] repelling."³⁷ The self-identity for which being strived so assiduously "*is* only as the *resulting coming together with itself*."³⁸ Being is now essence, "a simple *being-with-self*."³⁹

C. Centrifugal and Centripetal Force

By the time we have reached the inverse ratio of the factors, measure is totally present. Being present, it is a self-sufficient *totality* immune from external manipulation. The whole empirical world of measure is now necessary (and yet not sufficient) to measure anything fully. Since a totality is present, externality sublates itself. Any external subdivision or "analysis" of measure is destructive of

³⁰ SL, *supra* note 2, at 384; 1 WL, *supra* note 2, at 397 ("nach allen Seiten als der Widerspruch gezeigt").

³¹ SL, *supra* note 2, at 384; 1 WL, *supra* note 2, at 397 ("Sie ist an sich die Totalität, in der alle Bestimmungen des Seins aufgehoben und enthalten sind").

³² SL, *supra* note 2, at 384; 1 WL, *supra* note 2, at 397 ("So der Widerspruch ihrer selbst und ihres Bestimmtheits, ihrer an sich sendenden Bestimmung und ihrer gegetzten Bestimmtheit, ist sie die negative Totalität, deren Bestimmtheiten sich an ihnen selbst und damit diese ihre Grundeinseitigkeit . . . aufgehoben haben. Gesetzt hiemit als das, was die Indifferenz in der Tat ist, ist sie einfache und unendliche negative Beziehung auf sich").

³³ Hegel says in the *Lesser Logic*:

In the sphere of Essence one category does not pass into another, but refers to another merely. In Being, the form of reference is purely due to our reflection on what takes place: but it is the special and proper characteristic of Essence. In the sphere of Being, when some[thing] becomes another, the some[thing] has vanished. Not so in Essence: here there is no real other, but only diversity, reference of the one to *its* other. The transition of Essence is therefore at the same time no transition: for in the passage of different into different, the different does not vanish: the different terms remain in their relation.

GEORG W.F. HEGEL, HEGEL'S LOGIC § 111 Remark (William Wallace trans., 1975).

³⁴ SL, *supra* note 2, at 384; 1 WL, *supra* note 2, at 398 ("Die Bestimmungen als solche abgestoßene gehören aber nun nicht sich selbst an, treten nicht in Selbständigkeit oder Äußerlichkeit hervor").

³⁵ SL, *supra* note 2, at 384; 1 WL, *supra* note 2, at 398 ("nur durch deren Abstoßen von sich sind").

³⁶ SL, *supra* note 2, at 384; 1 WL, *supra* note 2, at 398 ("Gesetzte, schlechthin").

³⁷ SL, *supra* note 2, at 385; 1 WL, *supra* note 2, at 398 ("nur ein Moment ihres Abstoßens ist").

³⁸ SL, *supra* note 2, at 385; 1 WL, *supra* note 2, at 398 ("nur ist als das resultierende, unendliche Zusammengehen mit sich").

³⁹ SL, *supra* note 2, at 385; 1 WL, *supra* note 2, at 398 ("einfaches Sein mit sich").

the perfect unity it has become.

To illustrate this necessity, Hegel digresses to discuss the orbit of the planets around the sun. The orbit stands for the self-sufficient totality that measure has become. Earlier, building on the insight that measure entails external imposition upon a phenomenon that is partly free and independent of outside oppression, Hegel sets forth a hierarchy in the natural sciences in terms of immunity from the outside influence of a measurer. "The complete, abstract indifference of developed measure . . . can only be manifested in the sphere of *mechanics*."⁴⁰ The orbit of Mars around the sun is supremely indifferent to its measurement by the earthly godfathers of heaven's light. In the inorganic and even more in the organic spheres, fixed measure is "subordinated to higher relationships."⁴¹ The free development of measure according to logic is still less to be found in politics or constitutional law—"the realm of spirit."⁴² Therefore, planetary orbit is the proper analogy for fixed measure.

According to a discredited theory of astronomy, orbit can be broken down into centripetal and centrifugal force. Hegel knows that this "analysis" of orbit is self-contradictory. Nevertheless, the false *attempt* to reduce orbit into its constituent parts represents the immunity of the inverse ratio of the factors to a like analysis of a measurer. No analytical "breakdown" is possible at the level of the inverse relation of the factors. So just as orbit is immune from analysis, so is the inverse ratio.

In the false theory of planetary orbit, centripetal force is what draws the planets toward the center. Centrifugal force drives the planets away from the center. Their equilibrium is the elliptical orbit of the planet. Since Newton, however, physicists have identified centrifugal force as *inertia*, which is the very *negation* of force. Centripetal force is gravity—the unified force at work in planetary orbit. In modern physical theory, orbit is the unity of a force and a resistance to force.

Hegel refers to a well-known astronomic fact that planets in an elliptical orbit sweep equal areas with every increment of time.⁴³ Because the orbit is elliptical, this fact implies that the orbiting planet accelerates as it approaches perihelion—the closest distance to the sun—and decelerates as it approaches aphelion—the farthest distance from the sun. Of this fact, Hegel writes, "the quantitative side . . . has been accurately ascertained by the untiring diligence of observation, and further, it has been reduced to its simple law and formula. Hence all that can properly be required of a theory has been accomplished."⁴⁴ But for Hegel this is not enough. Theory assumes centripetal and centrifugal force are qualitative, opposed moments. Quantitatively, however, one increases and the other decreases, as the planets, in their evil mixture, pursue their orbits. At some point, the forces reverse in dominance, until the next tipping point is reached.

"[T]his way of representing the matter," Hegel writes, "is contradicted by the essentially qualitative relation between their respective determinatenesses which makes their separation from each other completely out of the question."⁴⁵ Each of the forces only has meaning in relation to the other. Neither can exist on its own.⁴⁶ To say, then, that one of the forces preponderates over its fellow is to say that the preponderant force is out of relation with its partner to the extent of the surplus. But this

⁴⁰ SL, *supra* note 2, at 331; 1 WL, *supra* note 2, at 341 ("Die vollständige, abstrakte Gleichgültigkeit des entwickelten Maßes . . . can nur in der Sphäre des Mechanismus statthaben").

⁴¹ SL, *supra* note 2, at 332; 1 WL, *supra* note 2, at 341 ("höheren Verhältnissen untergeordnet"). Professor Ferrini suggests that these observations were designed to answer Goethe, who questioned the propriety of measuring organic processes. She reads Hegel as *not* entirely rejecting measures of organic life, in the nature of Goethe, but conceding the limitations of doing so. Cinzia Ferrini, *On the Relation Between "Mode" and "Measure" in Hegel's Science of Logic: Some Introductory Remarks*, 20 OWL OF MINERVA 20, 47-48 (1988).

⁴² SL, *supra* note 2, at 332; 1 WL, *supra* note 2, at 342 ("im Reich des Geistes").

⁴³ James W. Garrison, *Metaphysics and Scientific Proof: Newton and Hegel*, in HEGEL AND NEWTONIANISM 8 (Michael John Petry ed., 1993).

⁴⁴ SL, *supra* note 2, at 380; 1 WL, *supra* note 2, at 393 ("Das Quantitative . . . ist durch den unermüdlichen Fleiß des Beobachtens genau bestimmt und dasselbe weiter auf sein einfaches Gesetz und Formel zurückgeführt, somit alles geleistet, was wahrhaft an die Theorie zu fordern ist").

⁴⁵ SL, *supra* note 2, at 380; 1 WL, *supra* note 2, at 393 ("Dieser Vorstellung widerspricht aber das Verhältnis ihrer wesentlich qualitativen Bestimmtheiten gegeneinander. Durch diese sind sie schlechthin nicht auseinander-zubringen.").

⁴⁶ This recalls Hegel's critique of calculus, where δy or δx were qualitative and meaningless outside the ratio $\delta y/\delta x$. See Carlson, *supra* note 7, at 2142.

is to say that the surplus does not exist.⁴⁷

It requires but little consideration to see that if, for example, as is alleged, the body's centripetal force increases as it approaches perihelion, while the centrifugal force is supposed to decrease proportionately, the [centrifugal force] *would no longer be able* to tear the body away from the former and to set it again at a distance from its central body; on the contrary, for once the former has gained the preponderance, the other is overpowered and the body is carried towards its central body with accelerated velocity.⁴⁸

Only an alien *third* force could save centripetal or centrifugal force from being overwhelmed. And this is tantamount to saying that the *real* force that guides the planets *sans check* cannot be explained.

The transformation from weakness to strength of one or the other forces implies that "each side of the inverse relation is in its own self the whole inverse relation."⁴⁹ The predominant force implies its opposite, servient force. The servient force has not vanished. "All that recurs then on either side is the defect characteristic of this inverse relation."⁵⁰ Either each force is wrongly attributed a self-identical existence free and clear of the other, "the pair being merely *externally* associated in a motion (as in the parallelogram of forces)."⁵¹ Or neither side can achieve "an indifferent, independent subsistence in the face of the other, a subsistence supposedly imparted to it by a *more*."⁵²

The idea of intensity cannot help. "[T]his too has its determinateness in quantum and consequently can express only as much force (which is the measure of its existence) as is opposed to it by the opposite force."⁵³ In other words, intensity is just a way of smuggling in the idea of the quantitative surplus, which is precisely not allowed because the measures are in a zero sum relation at this point. In any case, the sudden shift from predominant to servient implies qualitative change. The increase in one implies the decrease of the other.

Now what does the failed theory of centripetal and centrifugal force have to do with the inverse ratio of the factors? Hegel has said in the Remark that, if centripetal force were predominant, nothing can explain why this force would not sublimate centrifugal force once and for all, causing the planet to fly into the sun. Or, when centrifugal force is predominant, nothing can explain why the planets do not to disorder wander. So orbit must be utterly immune from the isolation of either force as a constituent part of the orbit. The orbit will not permit itself to be deconstructed externally in this way. Orbit has "being in and for self." Similarly, the inverse ratio of the factors is immune from externality generally and has a being-for-self that is also a being-in-itself.

With regard to the illegitimate forces, Hegel writes, "Each of these hypothetical factors vanishes, whether it is supposed to be *beyond* or *equal* to the other."⁵⁴ Orbit is simply indifferent to these external impositions. Similarly, *any* isolation by external reflection, when faced with a perfect equilibrium, implies their sublation in general. This self-abolition of quality and quantity, Hegel

⁴⁷ This point is related to Hegel's general point that force can only be observed if opposed by another force. See generally David Gray Carlson, *How to Do Things With Hegel*, 78 TEX. L. REV. 1377 (2000).

⁴⁸ SL, *supra* note 2, at 380-81; 1 WL, *supra* note 2, at 394 ("Es ist eine sehr einfache Betrachtung, daß, wenn z.B. wie vorgegeben wird, die Zentripetalkraft des Körpers, indem er sich dem Perihelium nähert, zunehmen, die Zentrifugalkraft hingegen um ebensoviele abnehmen soll, die letztere nicht mehr vermöchte, ihn der erstern zu entreißen und von seinem Zentralkörper wieder zu entfernen; im Gegenteil, da die erstere einmal das Übergewicht haben soll, so ist die andere überwältigt, und der Körper wird mit beschleunigter Geschwindigkeit seinem Zentralkörper zugeführt").

⁴⁹ SL, *supra* note 2, at 381; 1 WL, *supra* note 2, at 394 ("daß jede der Seiten des umgekehrten Verhältnisses an ihr selbst dies ganze umgekehrte Verhältnis ist").

⁵⁰ SL, *supra* note 2, at 381; 1 WL, *supra* note 2, at 395 ("Es rekurriert damit nur an jeder Seite das, was der Mangel an diesem umgekehrten Verhältnis ist").

⁵¹ SL, *supra* note 2, at 381; 1 WL, *supra* note 2, at 395 ("und mit dem bloß äußerlichen Zusammentreffen derselben zu einer Bewegung, wie im Parallelogramm der Kräfte"). The parallelogram of forces describes the phenomenon that, if two forces exist as vectors, their average vector forms a parallelogram with the original vectors, provided one of the original vectors is multiplied by the imaginary number, $-i$.

⁵² SL, *supra* note 2, at 382; 1 WL, *supra* note 2, at 395 ("keine ein gleichgültiges, selbständiges Bestehen gegen die andere erhalten kann, was ihr durch ein Mehr zugeteilt werden sollte").

⁵³ SL, *supra* note 2, at 382; 1 WL, *supra* note 2, at 395 ("da es selbst in dem Quantum seine Bestimmtheit hat und damit ebenso nur so viel Kraft äußern kann, d.h. nur insoweit existiert, als es an der entgegengesetzten Kraft sich gegenüberstehen hat").

⁵⁴ SL, *supra* note 2, at 379; 1 WL, *supra* note 2, at 392 ("Jeder dieser sein sollenden Faktoren verschwindet ebenso, indem er über den andern hinaus, als indem er ihm gleich sein soll").

comments paradoxically, "constitutes itself [as] the sole self-subsistent quality."⁵⁵ And, just as orbit is immune from the measurer's intervention, so is the inverse ratio of the factors.

Is the argument valid? My conclusion is yes. At the point where the argument is hazarded, the thing was metonymic. It was a negative unity of *all* the measure relations that the thing has with all the other things in the world. The thing, being fixed and complete, does not permit quantitative disequilibrium of the measures. The mere attempt of any such surplus to manifest itself is self-destructive. Any such manifestation puts the surplus—a qualitative proposition—in a lethal isolation from the thing. This self-identical thing is thus radically incommensurate with any other thing, including itself. Such an entity destroys itself by its very logic. What is left is the beyond of the realm of quality and quantity—essence. Quality and quantity *have* beyonds. But essence does not. It has swallowed quality and quantity whole and made externality an internality.

Conclusion

Every Hegelian could have said in advance that essence comes about because quality and quantity sublimate themselves. But how precisely does this unfold in the chapter Hegel names "The Becoming of Essence"? That is an exceptionally mysterious matter, with its use of bad astronomy and invocations of inverse ratios of factors. I have tried, in this paper, to show how this involves setting a substrate over against a completed world of measure. The two sides pass over into each other, and each side becomes not only its other but the unity of itself and its other. This introduces opposition into the sides. Now each side is the totality. External addition—quantitative pressure—can no longer have any bite. Externality itself is sublated, leaving a negative residue that is a totality in and for itself. This is the realm of essence, which bears the cancelled world of measure as merely ideal moments within the totality. Measure becomes the world of appearances, against which essence stands. The fact that essence has been constituted as a totality is vitally important for the sequel that follows measure. Essence is a *totality*; it does not let its other go forth but rather contains it. It is *reflective* in nature. In reflection, "the negative is thus confined within an enclosed sphere in which, what the one is *not*, is something *determinate*."⁵⁶ Furthermore, we will learn that phenomenal things dissolve themselves, and their dissolution leads to the *world of appearance*. These points could not be made without the groundwork in *totality* that the last chapter of measure accomplishes.

⁵⁵ SL, *supra* note 2, at 379; 1 WL, *supra* note 2, at 392 ("dieser also sich zum einzigen Selbständigen macht").

⁵⁶ SL, *supra* note 2, at 639; 2 WL, *supra* note 2, at 282 ("das Negative ist somit in einer um Schlossenheit gehaltenen Sphäre gehalten, worin das, was das eine nicht ist, ist Bestimmtes ist" [II:282]).