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The Systemic Harmony of Fact

Harmony

While *harmony* strikes the modern ear as primarily a musical term, the basic idea it conveys is something far larger both in its origins and in its subsequent history. Its Greek root, *harmonia,* denotes a joining together of components so that the resulting whole can accomplish its natural mission—the planks of a ship, for example, or the bones of a skeleton.[1] And in a still generally similar way the classic second edition of *Webster's Unabridged Dictionary* defines *harmony* in its subsequent, more general sense as "a combination of parts into an orderly whole . . . [exhibiting an] agreement or proportionate arrangement that is pleasing . . . [through] fitting well together." What is at issue throughout is thus a unifying coordination of elements into a comprehensive and evaluatively positive structure—an organically unified whole that is able to realize a positive function through the coordinated collaboration of its several parts.[2] The crux of harmony is a whole whose parts exhibit mutual accommodation under the aegis of normative principles.

The paradigm of harmony is, of course, musical harmony—the coordinated combining of different voices in producing an overall effect (*Einklang,* or a sounding as one). *E pluribus unum* could also be the motto of harmony.

One salient feature of a harmonious whole is thus what might be termed its *systemic integrity.* The crux here is the due coordination of multilateral—and even seemingly conflicting—factors to produce a commonly engendered overall effect.[3] A change that occurs in a harmonious whole becomes diffused throughout: here, when one thing is altered, everything is affected—change something, and nothing else can continue to make its contribution to the whole as effectively as before. Change in a harmonious whole is disequilibration. Were any part of such a whole to be removed—or even merely altered in some significant way—its unity would be disturbed and its evaluative condition diminished; its integrity would be impaired in the wake of any diminution—and thereby its positivity as well. By their very nature, genuinely harmonious wholes are best off as they are—a holism both of being and of value is operative here.

With a harmony, two factors accordingly become crucial: a coordinative unification of component parts and an evaluatively positive overall result, that is, a union of constituents into a functionally unified, coherently integrated whole in a way that is evaluatively positive either by way of intellectual appreciation or of affective response. The former factor might be characterized as *systemic integrity* and the second as *evaluative positivity.* Taken together these are what a *harmony* is all about. Apart from music, other paradigm examples of harmonious wholes are, on the affective side, works of fine art and, on the intellectual/cognitive side, the elegant systematization of bodies of mathematics or of theory manifolds in natural science.

The idea of harmony became significant as a philosophical concept in the thought of Pythagoras and his school in classical antiquity. For the Pythagoreans, the elegant axiomatic unity of geometry represented the quintessence of cognitive harmony and that of music the quintessence of aesthetic harmony. And the two were fused in the functioning of a mathematicized characterization of the motion of the heavenly bodies that made for celestial harmony, the "music of the spheres." The Pythagoreans carried this idea over into medicine as well.

Modern scholars generally characterize a system as a collection of interrelated entities, the relationships among which are such that in-

formation about them affords a basis for inferring conclusions about the structure, modus operandi, or temporal history of the system as a whole.[4] Such a formula indicates the plurality of key features of a system: wholeness, interrelatedness of parts, functional interrelationships, all of which are present in the traditional explication of the idea. The concept of systemic harmony is itself a chain that links together many distinguishable elements into a harmonious whole. And because systemic unity is a crucial aspect of any stably perduring whole, it is no wonder that the concept of harmony has penetrated into the thought of virtually every advanced culture on nearly every complex topic.

The Systemic Integrity of Fact and Burley's Principle

Let us now narrow our focus from harmony in general to *cognitive* harmony, characteristically conceived of as the systemic manifold of truth or fact. Facts must be both compatible and consonant with one another; both consistency and coherence are necessary: facts are related in such a way that *each fact not only accommodates all the others but also interconnects into an integrated whole.* For the facts that our beliefs purport often are and ideally always should be united in a pervasively integrated systemic structure. Every determinable fact is so severely hemmed in by others that even when we erase one, it can always be restored on the basis of what remains. The domain of fact is a logical harmony: even if we abandon a particular fact, it could still be effectively recovered from this collection of others. And the reason for this lies in the logical principle of *the systemic integrity of fact,* for the fabric of fact is woven tightly: it is *inferentially redundant;* any given fact can be recovered by logical inference from others in its informative environment.

One of the ways of exhibiting the systemic integrity of fact runs as follows. Assume (as a worst case of sorts) that we are given n truths that are entirely independent of one anther: $p_1, p_2, \ldots p_n$. Then, of course, their overall conjunction, p_1 and p_2 and . . . and p_n, must also state a true fact. But now consider the propositional set of truths:

$S = \{p_1, p_2, \ldots p_n, p_1 \text{ and } p_2 \text{ and } \ldots \text{ and } p_n\}$

Clearly, this is a set of true facts. But observe that this set is such that if any one member were to be deleted it could at once be restored by logical inference from the rest. Their inferential density along such lines means that facts are so closely intermeshed with one another as to form a logical network. Any change anywhere reverberates everywhere; when we fiddle with individual elements of such a system, we endanger the entire whole. In his influential *Treatise on Obligations* the medieval scholastic philosopher Walter Burley (ca. 1275–1345) laid down the rule—let us call it Burley's principle: *Whenever a false contingent proposition is posited, one can prove any false proposition that is compatible with it.*[5] His reasoning was as follows:

Let the facts be that

P. You are not in Rome.

Q. You are not a bishop.

And now, of course, also that

R. You are not in Rome or you are a bishop. (*P* or not-*Q*)

All of these, so we suppose, are true. Let us now posit by way of a (false) supposition that

Not-(*P*) You are in Rome.

Obviously (*P*) must now be abandoned—"by hypothesis." But nevertheless from (R) and not-(*P*) we obtain

You are a bishop. (Not-*Q*)

And in view of thesis (*Q*) this is, of course, false. Thus, given a falsity, that is, not-(*P*)—we have obtained not-(*Q*) by cogent inference from acknowledged truths—where Q is an *arbitrary true proposition.* And it is clear that this situation prevails in general. For let p and q be any two (arbitrary but nonequivalent) facts. Then all of the following facts will also, of course, result: $\sim(\sim p)$, $p \,\&\, q$, $p \vee q$, $p \vee \sim q \vee r$, $\sim p \vee q$, $\sim(\sim p$ and $q)$, and so on. Let us focus on just three of these available facts:

1. p
2. q
3. $\sim(\sim p \,\&\, q)$ or, equivalently, $p \vee \sim q$

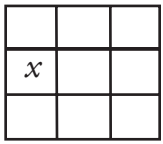
Now let it be that you are going to suppose not-*p*. Then, of course, you must remove (1) from the list of accepted facts and substitute

(1′) ~*p*

But there is now no stopping. For together with (3) this new item at once yields ~*q,* contrary to (2). Thus, that supposition of ours that runs contrary to accepted fact (that is, not-*p*) has the direct consequence that *any other arbitrary truth must also be abandoned.*

On this basis Burley's principle has far-reaching implications. For giving the systemic interconnectedness of fact, any and all fact-contradicting assumptions are pervasively destabilizing. As far as the logic of the situation is concerned, you cannot change anything in the domain of fact without endangering everything. Once you embark on a contrary-to-fact assumption, then as far as pure logic is concerned all the usual bets are off. Changing one fact always requires changing others as well.

A concrete illustration will help to make the point more graphic. Consider the situation of *x* emplaced as follows in a tic-tac-toe configuration:



Here we have the following facts:

1. There is exactly one *x* in the configuration.
2. This *x* is not in the first row.
3. This *x* is not in the third row.
4. This *x* is not in the second column.
5. This *x* is not in the third column.
6. This *x* is not on a diagonal.
7. This *x* is not at column-row position (3, 2).

Let it be that we erase one of the facts, say (5). Then, as we have already noted, the other facts of the situation will suffice to let us recover this by logical inference.

But now suppose that we do not simply lose sight of (5) by its *erasure* but actually *change* it, replacing it by not-(5). Then, of course, we would also have to go on to deny either (4) or (7). The fabric of fact is *logically unified:* any change in one fact will always compel further changes in other facts. And so from a logical standpoint the manifold of fact is an integral unit, a harmonious system where nothing can be altered without affecting something else.

This circumstance of the systemic integrity of fact has far-reaching ramifications. It means that once we begin to make alterations in the domain of fact we embark on a process that has no end. Suppose that we make only a very small alteration in the descriptive composition of the real, say, by adding one pebble to the river bank. But which pebble? Where are we to get it and what are we to put in its place at the location we take it from? And where are we to put the air or the water that this new pebble displaces? And when we put that material in a new spot, just how are we to make room for it? And how are we to make room for the material displaced there? Moreover, the region within six inches of the new pebble used to hold N pebbles. It now holds $N+1$. Of which region are we to say that it holds $N-1$? If it is that region yonder, then how did the pebble get here from there? By a miraculous instantaneous transport? By a little boy picking it up and throwing it? But, then, which little boy? And how did he get there? And if he threw it, then what happened to the air that his throw displaced that would otherwise have gone undisturbed? Here, problems arise without end. Every hypothetical change in the physical makeup of the real sets in motion a vast cascade of changes either in the physical constitution of the real or in the laws of nature at large, for what about the structure of the envisioning electromagnetic, thermal, and gravitational fields? Just how are these to be preserved as was given the removal and/or shift of the pebbles? How is matter to be readjusted to preserve consistency here? Or are we to do so by changing the fundamental laws of physics?

The systemic integrity of fact indicates that we cannot make hypothetical modifications in the makeup of the real without thereby destabilizing everything and raising an unending series of questions. And not only do *redistributions* raise problems but so do even mere

erasures, mere cancellations, because reality being as it is requires that redistributions follow in their wake. If by hypothesis we zap that book on the shelf out of existence, then what is it that supports the others? And at what stage of its history did the book first disappear? And if the book just vanished a moment ago, then what of the law of the conservation of matter? And whence the material that is now in that book-denuded space? Once more, we embark on an endless journey. As such considerations indicate, it is difficult to exaggerate the larger significance and import of the systemic harmony of fact.

Some Aspects of Cognitive Harmony

The object of the cognitive enterprise is to devise a manifold of putative truth that reflects, as clearly as possible, the developments of the manifold of fact. After all, inquiry is the pursuit of *truth.* And the overall domain of truth is in itself clearly a system—*das System der Wahrheiten überhaupt,* as Lambert called it.[6]

Let us consider the way in which the idea that "truth is a system" is to be understood. Three things are at issue: the set *T* of truths must have the features of *comprehensiveness* (or completeness), *consistency,* and *cohesiveness* (unity). The first two are familiar and well understood. Let us concentrate on the third.[7] Thus, when we formulate our knowledge claims systematically, we are endowing them with *verisimilitude* in its root sense of "resemblance to the truth." One arrives at the inference:

Knowledge must reflect the truth.
The truth is a system.

Knowledge should be a system.

This idea—that if our truth claims are indeed to approximate the truth itself, then they too must be capable of systematic development—has historically provided one of the prime grounds for adopting the systematicity of knowledge as a regulative ideal.

Against this background, it is only normal, natural, and to be expected that cognitive theory should insist that the standing of our

knowledge should reflect the systemic harmony of fact insofar as such a parallelism is at all realizable.

From antiquity to Hegel and beyond, cognitive theoreticians have embraced the ancient ideal that our knowledge should be developed architectonically and should be organized within an articulated structure that exhibits the linkages binding its component parts into an integrated whole and leaves nothing wholly isolated and disconnected. A cognitive system is to provide a framework for linking the *disjecta membra* of the bits and pieces of our knowledge into a cohesive unity. A cognitive system is to be a *structured* body of information, one that is organized in accordance with taxonomic and explanatory principles that link this information into a rationally coordinated whole.[8] The functional categories governing this organizational venture are those of understanding, explanation, and cognitive rationalization.

The underlying idea of a unity of knowledge has found many forms of expression over the course of time. The encyclopedia as a synoptic compendium of knowledge is historically its prime literary expression. And the university as an educational enterprise is historically its prime institutional expression. On the contemporary scene, its prime manifestation is the Internet with its powerful (though still rudimentary) search engines for effecting a coordination of information.

What counts for a cognitive system is the explanatory connection of ideas, not the particular style or format of their presentation. A system is individuated through general features relating to its structure and its rational architectonic, not through the particular manner of its expository development. Cognitive systematization is thus an epistemological notion, not a literary or rhetorical one—a matter of the organization of information, not its mode of presentation; of explanation, not of exposition.

The idea of systematization is intimately intertwined with that of planning in its generic sense of the rational organization of materials.[9] Planning, like organizing, is a mode of intellectual action, and it too exhibits the "amphibious" character of systematization. On the physical side one can have such projects as town planning, architecture, and landscape gardening; on the cognitive side, one can plan the or-

ganization for the purpose of explanatory or deductive or dialectical (persuasive) or mnemonic codification. Again, systematization is closely connected with the enterprise of design, albeit with a difference in orientation. For design—as generally understood—aims at the realization of physical forms,[10] while systematization is not less concerned with intellectual ones. But the basic issues are the same on both sides: the articulation of a rational structure on the basis of "best-fit" considerations, with all the parameters of systematization—economy, efficiency, generality, uniformity, and so on—figuring in this role. A cognitive system is a "design for knowing," and system building is preeminently a problem of rational design.

A painting or piece of architecture—any good design—must combine a variety of potentially conflicting elements in the conjoining synthesis of a cooperative harmony, and this sort of rational unification is exactly what a system is all about. The harmonious systematicity of knowledge is thus to be construed as a category of understanding, akin in this regard to generality, simplicity, and elegance. Its immediate concern is with form rather than matter, and it bears on the organizational development of our knowledge rather than on the substantive content of what is known, and deals with cognitive structure rather than subject-matter materials. Just as one selfsame range of things can be characterized simply or complexly, so it can be characterized systematically or unsystematically. Systematicity relates in the first instance not to *what* we know—the facts at issue in the information at our disposal—but rather to *how we proceed in organizing our knowledge.* And these two issues are, of course, going to be closely interrelated.

The Functions of Cognitive Systematization

The truth about reality must inevitably form a system, but this is more than can be said for our *knowledge* of it. Cognitive harmony consists in systematization—in fusing the sundry bits and pieces of our knowledge into a cohesively structured and rationally integrated whole. It constitutes an ideal for the rational articulation of our knowledge—alike in its formal and its factual subdomains. However,

it is well to begin by recognizing that there is no justification for issuing in advance—prior to any furtherance of the enterprise itself—a categorical assurance that the effort to systematize our knowledge of the world is bound to succeed. The systematicity of our factual knowledge is not something that can be guaranteed a priori, as prevailing on the basis of the "general principles" of the matter. The parameters of systematicity—coherence, consistency, uniformity, and the rest—represent a family of regulative ideals toward whose realization our cognitive endeavors do and should strive. But the drive for systematicity is the operative expression of a guiding aim or objective and thus not something whose realization can be taken for granted as already certain and settled from the start. There is no valid reason to assume or presume from the very outset that systematicity will ultimately emerge in the results of our inquires. The best we can do here is to proceed in the light of a hope that we expect the wisdom of hindsight to validate eventually.

This drive for cognitive order and cohesion is informed and crucially conditioned by a coordinate cognitive drive for comprehensiveness, variety, novelty, and the like. As students of human biology have shrewdly observed, the central nervous system of humans demands a novelty of inputs to avoid boredom—exploratory behavior and novelty-tropism are a fundamental aspect of the biological outfitting of higher animals.[11] Clearly, the systematization of our knowledge of fact has a deep Darwinian rationalization. To make our way in a difficult world, we humans, as rational animals, need to exploit regularities for our effective functioning. Now, the rules and principles of rational procedure are easiest to grasp, master, to apply, and to transmit if they themselves are organized in as a rational structure, that is, are developed systematically. And the concern for system is nothing else than this drive for metarulishness, an effort to impart to our principles of behavioral and intellectual procedure a structure that is itself a manifold integrated by systemic principles.

A cognitive system is not just a collection of endorsed (or accepted) *theses* but also embodies the *rationale* that underwrites these endorsements. The characterization of a system-included thesis in normative terms (as "true," "warrantedly assertible," and the like) is the

product of the operations of rationale-establishing principles that are no less crucial to the makeup of the system than the theses it accommodates. Christian Wolff's formula applies: a cognitive system as "a collection of truths duly arranged in accordance with the principles governing their connection" (*systema est varbartum inter se et cum principiis suis connexarum congeries*).[12]

But the question remains: what rational considerations render systematicity so desirable—what is the legitimative grounding of its status as a regulative ideal in cognition? What, in short, does systematicity do for us? After all, systematization is a purposeful action and "system" is a functional concept—systematizing is something that has to have a purpose to it. The answer here is straightforward. Knowledge is organized with various ends in view—in particular, the heuristic (to make it easier to learn, retain, and utilize) and the probative (to test and thereby render it better supported and more convincing). *Homo sapiens* as a rational animal exhibits a deep need for understanding, and the facets of rational structure (unity, comprehensiveness, coherence, and the rest) are constitutive components of that systematicity through which alone understanding can be achieved.

This epistemological dimension will be our prime focus of concern. In the present study of cognitive systematization it will, in effect, be the monograph and not the textbook that is the paradigm. We shall put aside the psychological aspects of knowledge acquisition and utilization (learning, remembering, and so on), focusing instead on the rational aspects of organizing knowledge in its probative and explanatory dimensions. We shall deal with the systematizing of knowledge as a matter of cognitive planning for theoretical and purely cognitive purposes rather than focusing on matters of learning and training.

Given such a focus on probative and explanatory issues, the systematic development of knowledge—or purported knowledge—may be seen to serve three interrelated functions:

1. *Intelligibility:* Systematicity is the prime vehicle for understanding, for what renders factual claims intelligible is their systematic interrelationships. As long as they remain discrete and disconnected, they lack any adequate handle for the intellect that

seeks to take hold of them in its endeavor to comprehend the issues involved.

2. *Rational organization:* Systematicity—in its concern for such desiderata as simplicity and uniformity—affords the means to a probatively rational and scientifically viable articulation and organization of our knowledge; the systematic development of knowledge is thus a key part of the idea of a science.
3. *Verification:* Systematicity is a vehicle of cognitive quality control. It is plausible to suppose that systematically developed information is more likely to be correct—or at any rate less likely to be defective—thanks to its avoidance of the internal error-indicative conflicts of discrepancy, inconsistency, and disuniformity. This indicates the service of systematization as a testing process for acceptability, an instrument of verification.

Let us consider these three themes more closely. Its commitment to providing a rationale renders cognitive systematization an indispensable instrument of rationality. Within a systematic framework, the information to be organized is brought within the control of a network of rule-governed explanatory and justificatory relationships. The facts are thus placed within patterns of order through their subordination under common principles, and their explanatory rationalization is accordingly facilitated. Systematicity is the key to understanding—it provides the channels through which explanatory power flows.

Cognitive systematization thus constitutes an instrumentality explanation, and we explain things with an end in view—namely, to make them intelligible. And this calls for a discernment of rationally available patterns, rendering matters "only natural and to be expected" through the provision of a suitable rationale. A systematic synthesis on the basis of evidential or explanatory cohesion does the job of "accounting for" the theses at issue in both senses of this term—that is, to explain the fact and to provide grounds for its claims to factuality. In this way, a cognitive system provides illumination: the systematic interconnectedness of facts render those at issue amenable to reason by setting them within a framework of ordering principles that

bring their mutual interrelationships to light. But what is the nature of the interconnecting linkages at issue here?

The two main possibilities for rational linkage are connections of the probative or *evidential* order and connections of the justificatory or *explanatory* order. There is an important difference here between these two. In the latter case we are concerned with what medieval schoolmen called the order of why-it-is-so reasons (*rationes essendi,* or ontological reasons), and in the former with what they called why-we-hold-it-to-be-so reasons (*rationes cognoscendi,* or epistemological reasons). Consider the height of yonder tree. I say it is roughly one hundred feet high. The ontological reason for my claim will lie in the following sort of explanation: that it is a tree of such-and-such sort, which has such-and-such growth characteristics. And that the soil and weather conditions afforded it with such-and-such requisites for growth. On the other hand, the epistemological reason for my claim might simply be that it cast a shadow of approximately ten feet at a time when a certain ten-foot pole cast a shadow of one foot. The one set of reasons deals with the *explanation* of our claims, the other with how we *substantiate* them—our rationale *for our holding them to be so.*

But notwithstanding the distinction that is at work, there need be no separation here. For in the end the best basis for evidentiation—for substantiating a claim—is through an understanding of why it is in the larger scheme of things that the claimed fact must be so. Substantiation should cohere with substance. And, so, the very fact that a certain item fits neatly into an explanatory system provides a powerful indication that we have gotten it right and affords us with substantial evidence for this claim.

The systematic development of our knowledge accordingly provides us with a test of cognitive appropriateness; it serves as a monitor of the adequacy of the articulation of our body of knowledge (or purported knowledge). This is evident from a consideration of the very nature of the various parameters of systematicity: consistency, consonance, coherence—and even completeness (comprehensiveness). The advantages of injecting these factors into the organizing articulation of our knowledge are virtually self-evident. In the pursuit of factual knowledge we strive to secure correct information about the

world. We accordingly endeavor to reject falsehoods, striving to ensure that to the greatest feasible extent the wrong theses are kept out of our range of cognitive commitments. And the pursuit of consistency, consonance, coherence, and completeness clearly facilitates the attainment of this ruling objective. The systematization of knowledge is a prime instrument of error-avoidance—of cognitive quality control.

There are in fact very different sorts of "errors." There are errors of omission, which arise when we do not accept the statement *P* when *P* is in fact the case. These involve the sanction (disvalue) of ignorance. And there are errors of commission, which arise when we accept *P* when in fact not-*P* is the case. These involve the mark of cognitive dissonance and outright mistake. And clearly both sorts of missteps are errors. The rules of the cognitive game call not only for rejecting falsehoods and keeping the wrong things out but also for accepting truths and assuring that the right things get in. Systematization is a great help in these regards. It is presumptively error-minimizing with respect to the two kinds of cognitive errors. Given its coordinated stress on comprehensiveness and mutual fit, the systematization of our knowledge clearly facilitates the realization of its governing objective: the engrossing of information in the context of an optimal balance of truth over falsehoods.

An effective cognitive system must be constructed more like a medieval trail than a modern highway. It must follow the natural bends and contours of the terrain that it traverses rather than cutting a level path through it all. A good system must afford a vivid look over its landscape as it stands rather than reshaping that landscape to suit its own convenience. Again, those parameters of systematization must themselves be balanced on systematic harmony. Achieving simplicity, say, through sacrificing comprehensiveness by arbitrarily dismissing inconvenient detail, is a pathway not to supersystematicity but to a betrayal of the systemic enterprise as such.

The Value Dimension

At this point the reader may well feel tempted to interject as follows:

> The preceding discussion has insisted on the harmony of the domain of fact. But as was stipulated from the very outset, harmony requires both systemic integrity and evaluative positivity. Granted, the discussion has shown in some detail that the factual realm entails systemic integrity by way of inferential interconnection. But this axiological aspect of the matter yet remains untouched. This comment is quite in order and it is now time to remedy this omission.

The evaluative dimension here is rooted in the nature of the systemic integrity at issue. For in this factual arena it is not just a system that is at issue but a *cognitive* system—one whose very integrity is rooted in inferential principles of logical interconnection. It is this logical coherence of fact—the circumstance of it admitting a smooth inferential transit from place to place within the overall domain—that facilitates comprehension. Systematicity facilitates cognitive access: a systemic whole of inferentially interrelated fact is for this very reason user friendly for rational intelligences engaged in the quest for understanding.

The evaluative aspect of factual harmony is accordingly grounded in the circumstance that the realm of fact is not only a systemically cohesive unit under the aegis of principles but that the principles at work here are themselves the fundamental principles of rational cognition. But cognition itself is a prime human good. And rationality is a deeply normative conception in which all of the characteristic cognitive virtues of a *system* of propositions—unity, coherence, simplicity, and the rest—play a prominent role. All of these, after all, are so many modes of intellectual economy and elegance that render the body of knowledge at issue user friendly to a mind seeking to understand and master it. All such fashions are "aesthetic" aspects of a body of information that facilitate its comprehensibility. Accordingly, any intelligent being committed to rational comprehension is bound to prize these features of cognitive systematicity. For intelligent beings, comprehensibility and intelligibility are automatically bound to count as cardinal virtues because they render the materials at issue grist to its mill. Systems as such can be good or bad; but *cognitive* systems can by

their very nature lay some claim to positivity. In sum, in the case of a specifically cognitive system it is the factor of systemic integrity itself that provides for the positivity that is requisite for a harmonious whole.

This value dimension of a cognitive system—the infusion of value into the realm of fact through the mediation of its comprehensibility—was already at work in the teaching of Plato. The following passage from the *Timaeus* clearly attests to this:

> The world is the best of things that have become and its course is the best of courses. Having come to be, then, in this way, the world has been fashioned on the model of that which is comprehensible by rational discourse and understanding. . . . The demiurge [world-maker] brought the world from disorder into order, since he judged that order was in every way the better. . . . Wishing to make this world most closely like that intelligible order which is best and in every way complete . . . its maker did not . . . [make several] but this cosmos has come to be and is and shall hereafter be one and unique. . . . [On this basis] the body of the universe was brought into being, coming into concord (*philia*) by means of proportion (*analogia*). (*Timaeus* 32 B.C.)[13]

In just this same way, the cosmogenesis of Book 10 of Plato's *Republic* pictures creative Necessity as compiling a single unified rational harmony (*harmonia*)—explicitly so characterized. And throughout the history of neo-Platonism this aspect of interconnected coherence of fact and reality remained in the foreground. "All things conspire together" (*sympnoia panta*) was a central thesis of Plotinus.

In any event, cognitive systematicity, however, occupies a different situation. Its status as a regulative ideal is inherent in the very nature of the cognitive enterprise. For the key aspects of system—that is, comprehensiveness and order—engender a native aspect that inheres in the very nature of humans' cognitive position as a creature emplaced *in medias res* in a world not of our making, and hostile or at best indifferent, that we must bring under cognitive control.

Systematic Harmonization in the Cognitive System Concept Itself

It is clear that harmonious systematicity is itself a systemically fact-coordinative concept that unites in a symbiotic and systemic union various elements that, from the purely theoretical perspective, might well go their separate ways, but which "the ways of the world"—or, rather, the conceptualizing mechanisms that afford our instrumentalities for their rationalizations—have inseparably joined together.

The parameters of systematicity (simplicity, regularity, uniformity, comprehensiveness, cohesiveness, unity, harmony, economy, and so on) all represent certain intellectual values or norms within the cognitive enterprise. To be sure, this fact that systematicity involves a coordinated plurality of desiderata means that these may possibly conflict with one another in concrete contexts. The pluralism of desiderata—the fact that each must be taken in the context of others within the overall picture of systematicity—means that their pursuit must moderate them to one another. Whenever multiple desiderata interact, we cannot appropriately cultivate one without reference to the rest. For when we have to evaluate something where different, incommensurable, and potentially conflicting value parameters are at work, the issue is no longer one of maximization but one of harmonization, of getting a balance that, when all is considered, achieves optimality without necessarily maximizing each of those parameters.[14] Harmonious balance is the key here.

Consider an analogy: The prime desideratum in a motor car is its safety. But it would not do to devise a "perfectly safe" car that only goes 1.75 miles per hour. Safety, speed, efficiency, operating economy, breakdown-avoidance are *all* prime desiderata of a motor car. Each counts, but none predominates at the expense of another. A good car design incorporates them all. The situation with respect to our cognitive ideals is altogether parallel. In formulating an effective cognitive system in a particular case, achieving completeness may require sacrificing simplicity. The need for mutual support and functional unity may countervail against functional elegance and economy. In the cognitive systematization of a certain body of knowledge the various pa-

rameters of systematization—simplicity, uniformity, comprehensiveness, and the rest—may represent focuses of conflict and tension.

Systematicity is an internally complex and multicriterial conception that embraces and synthesizes all the various aspects of an organic, functionally harmonious whole. The paradigmatic system is a whole that has subordinate parts whose existence and functioning facilitate—indeed, make possible—the existence and functioning of the resulting whole. A true system is subject to a pervasive unity of interrelated components, a unity that correlates with the notion of functional harmony completeness.

Interestingly enough, then, the conception of systematic integrity that is pivotal for harmony is thus itself a system-oriented conception: a whole that represents a congeries of closely interrelated and harmoniously interconnected conceptions. It is a composite idea, a complex Gestalt in which various duly connected, structural elements play a crucial role. The notions of *organism* and *organic unity* provide a unifying center for this range of ideas whose focal point is the harmonious collaboration of mutually supportive parts operating in the interest of a unifying aim or principle.[15]