

The Striving Possibles

Eric Steinhart

www.ericsteinhart.com

ABSTRACT: Why is there something rather than nothing? Leibniz offered a surprising answer to this question with his theory of the striving possibles. His theory was that possible objects strive to become actual things. More perfect possibilities strive more intensely. All the possibilities compete with each other, and the best possibilities win the competition to become actual. Leibniz has a surprisingly modern analysis of the concept of perfection. Possibilities are bit strings, and their perfections are their complexities. The theory of the striving possibles can be formulated in evolutionary terms.

1. The Striving Possibles

One of the most interesting Leibnizian ideas is the *doctrine of the striving possibles* (Leibniz, 1697; Blumenfeld, 1981; Rescher, 1991: 171-172, 174-175). Leibniz says there is a population of abstract objects. These abstract objects are “essences”; they are the forms of things. If an essence is concretely realized, then it exists; otherwise, it lacks existence. For example, *fatherhood* is an essence which is concretely realized by fathers. If there are fathers, then fatherhood has existence. But unicornicity is an essence which is concretely realized by unicorns. Assuming that there are no unicorns, it follows that unicornicity is an essence which does not have existence. It is a property which is not instantiated. Leibniz says that every essence strives for existence:

from the fact that something rather than nothing exists, it follows that in possible things, or in their possibility or essence itself, there is a certain demand or (so to speak) a claim for existence; in short, that essence tends by itself toward existence. From this it follows, furthermore, that everything possible, that is, all that expresses a possible essence or reality, tends with equal right toward existence, the degree of this tendency being proportionate to the quantity of essence or reality, that is, to the degree of perfection of the possible involved. (1697: 86)

The doctrine of the striving possibles involves the *Law of Striving*. It can be expressed as “essence tends by itself toward existence”. Or else as “*Everything possible demands that it should exist*, and hence will exist unless something else prevents it, which also demands that it should exist and is incompatible with the former” (Leibniz, in Rescher, 1991: 171). The Law of Striving does not involve any God or any physical thing. It is an ultimate sufficient reason for the existence of concrete things. The Law of Striving is a natural law. Leibniz gives an argument for the Law of Striving:

This proposition, that everything possible demands that it should exist, can be proved *a posteriori* [from empirical evidence], assuming that something exists; for either all things exist, and then every possible so demands existence that it actually exists; or else some things do not exist, and then a reason must be given

otherwise than from a general reason of essence or possibility, assuming that the possible demands existence in its own nature, and indeed in proportion to its possibility or according to the degree of its essence. Unless in the very nature of essence there were some inclination to exist, nothing would exist; for to say that some essences have this inclination and others not, is to say something without a reason, since existence seems to be referred generally to every essence in the same way. (Leibniz, in Rescher, 1991: 171-2; see also 206)

Of course, Leibniz says that the Law of Striving operates within the mind of God. Thus essences demand that God make them exist. But that is unnecessary. And the very way that Leibniz states the Law of Striving makes God irrelevant. In fact, since God is a concrete thing, if God were to exist, then the Law of Striving would be responsible for the existence of God! It would bring God into being. The Law of Striving is more fundamental. Leibnizian metaphysics doesn't need God.

2. Abstract Possibilities are Bit Strings

According to Steiner (1998: 4-5), a conceptual Pythagorean says that the essences of things are mathematical structures. Leibniz is a conceptual Pythagorean. He says the essences of things are numbers (Rescher, 1991: 191; Strickland, 2006: 21). The numbers 0 and 1 have special significance for Leibniz. He was an early student of the binary number system (Ryan, 1996). He thinks of 0 as analogous to nothingness and of 1 as analogous to the pure being of God (Leibniz, 1703; Strickland, 2006: 21-25).

All created things are produced by the combination of being (1) and nothingness (0). Obviously, there is no need to think of 1 as God or being or 0 as nothingness. Those old-fashioned interpretations are irrelevant to the reasoning. These numbers are just numbers. The numbers 0 and 1 are *binary digits*. Since binary digits are also known as *bits*, a series of binary digits is a series of bits. A series of object of some type is also known as a *string*, so a series of bits is a *bit string*. Here's an example: 00110101.

Of course, when we write out a bit string, we're making use of the linearity of space. More abstractly, a bit string associates some ordinal position with a bit. It is a set of ordered pairs of the form (ordinal position n , bit at the n -th position). For instance, spelled out with mathematical precision, the bit string 00110101 is $\{(0, 0), (1, 0), (2, 1), (3, 1), (4, 0), (5, 1), (6, 0), (7, 1)\}$. And you can see that this string marks n with 1 if n is prime and with 0 otherwise. This bit string carries some information about the first few numbers. Any bit string is a function from some ordinal n to the set $\{0, 1\}$. A bit string (henceforth just a string) from n to $\{0, 1\}$ is finite iff n is finite; it is infinite otherwise.

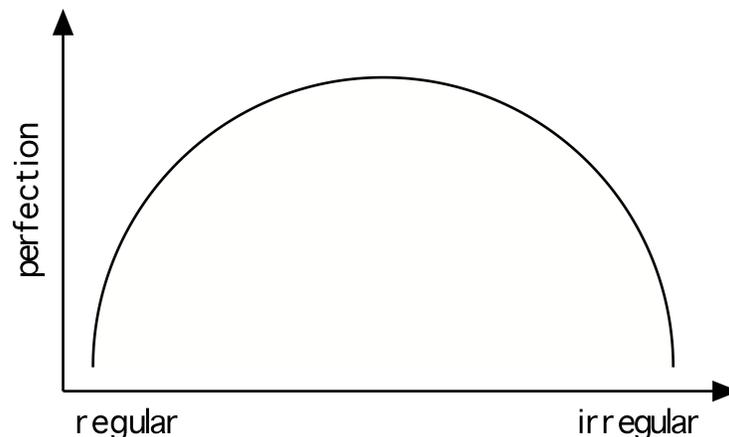
3. Perfection is Proportional to Order and Variety

At several points in his writings, Leibniz identifies perfection with *quantity of essence* (Leibniz, 1697; Rutherford, 1995: 23). But the quantity of essence of some thing is the quantity of *harmony* in that thing (Rutherford, 1995: 35). Harmony is proportional to both order and variety (Rutherford, 1995: 13). Thus Leibniz writes that God has "chosen

the best possible plan in producing the universe, a plan which combines the greatest variety together with the greatest order” (PNG, sec. 10; see DM, secs. 5-6). Again he writes that perfection is “the greatest possible variety, together with the greatest possible order” (*Monadology*, sec 58). Thus perfection is proportional to both order and variety (Rescher, 1979: 28-31). As order and variety increase together, so does perfection.

It is reasonable to model variety as irregularity and to model order as regularity. But these concepts can be analyzed in computational terms. A *string* is a sequence of binary digits (it is a series of bits). Strings have varying degrees of regularity. These ideas can be made mathematically precise using the notion of *algorithmic compressibility* from Kolmogorov. Thus regularity corresponds to algorithmic compressibility, while irregularity corresponds to algorithmic incompressibility. Irregular strings are *random*.

A string that is entirely regular has minimal variety and maximal order; a string that is entirely irregular has maximal variety and minimal order. For example, a string that consists of all 0s is regular; a string that is random is maximally irregular. According to Leibniz, since perfection maximizes both order and variety, both of these extreme types of strings are minimally perfect. Thus an entirely regular string has perfection zero while an entirely random string has perfection zero. Perfection is convex.



4. The Best of All Possible Universes

For Leibniz, the essences are infinite bit strings. There is a set of these bit strings (of these essences). Leibniz states that all the essences in this set strive for existence. But some of them cooperate with each other (they are consistent with each other) while others compete (they contradict one another). So there is a great war among these essences. They are all engaged in an abstract struggle for concrete reality. This abstract struggle partitions the set of bit strings into subsets. Leibniz describes it like this:

Everything possible demands that it should exist, and hence will exist unless something else prevents it, which also demands that it should exist and is incompatible with the former; and hence it follows that that combination of things always exists by which the greatest possible number of things exists; as, if we

assume A, B, C, D to be equal as regards essence, that is, equally perfect, or equally demanding existence, and if we assume that D is incompatible with A and with B, while A is compatible with any except D, and similarly as regards B and C; it follows that the combination ABC, excluding D, will exist; for if we wish D to exist, it can only coexist with C, and hence the combination CD will exist, which is more imperfect than the combination ABC. (Leibniz, in Rescher, 1991: 171)

For Leibniz, the most perfect set of essences wins the struggle to become actual. But this is just the biggest set of mutually compatible essences: “out of the infinite number of combinations and series of possibles, one exists through which a maximum of essence of possibles is produced into existence” (1697: 86). This biggest set of mutually compatible essences is the best of all possible universes.

The Leibnizian doctrine of the striving possibles implies that the best of all possible universes exists (and Leibniz did indeed think that our universe is the best of all possible universes). But it seems obvious that our universe is not the best of all possible universes. So the doctrine of striving possibles needs to be modified. Furthermore, the Leibnizian doctrine ignores the relations that essences have with each other. More complex essences depend on simpler essences. Essences do not vie for actuality all at once. Potentials are anchored in actualities. If some essence is actualized, then it has potentials. Those potentials vie amongst themselves for actuality.

5. Evolution by Axiological Selection

There are some concrete things rather than none. The existence of any concrete things requires an explanation. The explanation cannot involve any concrete things. So, the explanation for the existence of any concrete things can involve only abstract things in abstract relations. One of these abstract explanations is the the Leibnizian *doctrine of the striving potentials* (Leibniz, 1697; Blumenfeld, 1981; Rescher, 1991: 171-5).

The original version of the Leibnizian striving possibles suffers from many problems.¹ These problems can be solved by recasting the Leibnizian doctrine in evolutionary terms (Swenson, 1997: 58). According to the evolutionary version of the striving potentials, the potentials are analogous to organisms; just as organisms struggle for survival, so the potentials struggle for actuality; just as the fittest organisms survive the struggle, so the most perfect potentials become actual. Hence the evolutionary version of the striving potentials describes an abstract evolutionary algorithm.

The evolutionary version of the striving potentials begins with the assertion that there are some abstract *potentials*. Potentials are ordered by a *dependency* relation. More complex potentials depend on simpler potentials. The dependency relation is analogous to the relation between some asexual *parent* organism and its *offspring*. Every potential has some more complex offspring potentials; every complex potential has exactly one simpler parent. Exactly one potential is *independent*. The independent potential is

simple. Since it does not depend on any parent potential, the simple potential is the *initial potential*. If the initial potential is actual, then a simple thing exists.

If every parent of a potential is actual, then that offspring potential is *active*. Every active potential *strives* for actuality.² Every striving potential either *competes* with others for actuality or it does not.³ If some striving potential does not compete with any others for actuality, then its striving succeeds; it becomes actual. Every striving potential competes with and only with its siblings. Thus all the offspring of some actualized potential compete with each other for actuality. They are alternative versions of their parent. If some striving potential wins this competition, it becomes actual; if it loses, it does not become actual. Potentials strive more or less *intensely* for actuality. The intensity with which any potential strives for actuality is proportional to its value.⁴ The offspring of any potential are all racing together towards actuality. The best offspring run fastest and win the race. Rescher states that “in the virtual competition for existence among alternatives it is the comparatively best that is bound to prevail” (2010: 33-34).

Among all the potentials, the initial potential stands out for its independence. Since the initial potential has no parents, it follows by default that every parent of the initial potential is actual; hence it is active; hence it strives for actuality. Since the initial potential has no siblings, it does not compete with any others for actuality. Since it does not compete, it succeeds; it becomes actual. The simple initial thing exists. But now the simple initial thing has many offspring potentials. They all compete for actuality, and the best among them become actual. These are the most perfect children of the initial thing; they are the things in the first generation. Each first generation thing has some offspring potentials; the offspring of each thing compete for actuality, and the best among them become actual. These are the second generation things. The iteration of this logic produces an infinitely ramified genealogical tree of ever better things. Every thing in this tree is surpassed by every possible improvement of itself.

There are many explanations for the existence of concrete things. One of these is the evolutionary version of the Leibnizian doctrine of the striving potentials. Since value plays a key role in that theory, it can be referred to as *evolution by axiological selection*. One great advantage of evolution by axiological selection is that it parallels evolutionary theories in the natural sciences (in physics, chemistry, and biology). Since evolution by axiological selection has this advantage, it is better than every competing explanation for the existence of concrete things. Hence it is the best explanation. So, by inference to the best explanation, evolution by axiological selection is true. Evolution by axiological selection asserts that every active potential strives for actuality. But if those potentials strive, then they are animated by some abstract power. This power aims at the maximization of comparative value. It is an optimizing power. According to the ideas developed here, this power is *spirit*. Therefore spirit is an optimizing abstract power, which gives concrete existence to all concretely existing things.

6. An Evolutionary Version of the Striving Possibles

It is natural to think of the doctrine of the striving possibles in evolutionary terms (Swenson, 1997: 58). The essences are analogous to organisms; the struggle for actuality is analogous to the struggle for survival; and the victory of the most perfect essences is analogous to the survival of the fittest organisms. The doctrine of the striving possibles describes an abstract evolutionary algorithm. Thus Rescher states that “in the virtual competition for existence among alternatives it is the comparatively best that is bound to prevail” (2010: 33-4). Here is an abstract evolutionary algorithm:

- *The Zeroth Generation.* Start with the simplest possibles. These possibles are abstract forms. They struggle, so that the best among them become *zeroth generation* actualities. These actualities are concrete things which realize the forms.
- *The First Generation.* The actualities in the zeroth generation have potentials, which are successor possibilities. These successor possibilities struggle, so the most perfect among them become actual. These best successor possibilities become the *first generation* actualities. Since many zeroth generation actualities have many potentials, and many of these will win the struggle, the successor relation is a branching relation: each zeroth generation actuality is the root of a little branching bush.
- *The Second Generation.* The actualities in the first generation have potentials, which struggle for actuality. The most perfect among them become *second generation* actualities. Once more, each first generation actuality is the root of a little branching bush, whose leaves are the second generation actualities.
- *The Higher Generations.* The actualities in the n -th generation have potentials, which struggle for actuality. The most perfect among them become the $(n+1)$ -th generation actualities. And so it goes. These laws entail the existence of an infinite hierarchy of increasingly perfect actualities. It has an n -th generation for every finite number n . Each n -th generation actuality is the root of a little branching bush, whose leaves are the $(n+1)$ -th generation actualities. So the hierarchy has the form of a forest. Each tree in this forest has as its root one of the zeroth generation actualities.

Notes

¹It seems to imply the existence of the best of all possible universes; but no such universe exists. It seems to maximize the number of things; but this maximization of the number of things contrasts with the maximization of value.

²Leibniz says that every potential tends to actuality; every essence tends towards existence (1697: 86). He says that “Everything possible demands that it should exist” (Leibniz, in Rescher, 1991: 171). But in the evolutionary version, the striving for actuality follows the dependency relation on potentials.

³For Leibniz, every potential competes with every other; it is a war of all against all. Thus “Everything possible demands that it should exist, and hence will exist unless something else prevents it, which also demands that it should exist and is incompatible with the former” (Leibniz, in Rescher, 1991: 171). But on the evolutionary version, the competition is merely among the sibling offspring of any potential.

⁴Leibniz says each potential has a tendency to actuality and that “the degree of this tendency [is] proportionate to the quantity of essence or reality, that is, to the degree of perfection of the possible involved” (1697: 86). And again “the possible demands existence in its own nature, and indeed in proportion to its possibility or according to the degree of its essence” (Leibniz, in Rescher, 1991: 171-2; see also 206).

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