Blessed Noise

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Every engineer has to struggle with noise in the system he builds, measures, or tries to control and manipulate. His best hope is that the noise will be negligible, or at least, relatively small compared to the main signal. He knows that the noise is unavoidable. On the other hand, every scientist knows that any measurement is an average. To measure something with higher resolution means to take an average during smaller time intervals. The problems of noise and resolution (the average) seem to be the two main sources of our inability to measure anything with absolute accuracy.

One can find exact periodicity, exact symmetry, etc., only in mathematical structures. The uncertainty about what a specific phenomenological value is implies that, in nature, one will only find almost symmetry, almost periodicity, and so on. There is a possibility to parameterize this uncertainty. Such a "parameter" can be the difference between two different averages (measurements in different resolutions) or the difference between two almost equivalent points in an almost periodic process. Since there are endless ways to execute the average, the number of such parameters is infinite. The parameters, that are supposed to vanish under the hypothetically ideal circumstances within the usual paradigm, are not just some inconvenient, yet unavoidable, small perturbations around the main course of phenomena; but rather, these are the traces of the processes that create phenomena, the output parameters of the black box. In a non-linear world, wherein definition is discretization, discretization is averaging, and how we average defines (non-linearly) what is being averaged, it could be said that how we attain the average defines what is being averaged (defined).

The black box is neither a phenomenon nor an event - it is the "structure". The aspiration to achieve "consistency", "stabilization", is an abstract notion realizable through an infinite number of routes. Being qualitative potential, any realization is a specific mode, and such a mode is a multidimensional entity. A lesser dimensional cut of this entity can become the phenomenon. On the other hand, the phenomenon contains within its little discrepancy the almost values, those "infinitesimal tail"s that are the history of its becoming and the traces of the structure that stabilized into being the phenomenon. Knowing the structure enables us to activate the infinitesimal tails to control and manipulate the stabilized process (which is the object), or to destabilize and then re-stabilize it to be a new object or a different mode of the same object.

The possibility to control any complex system by means of the mapping is due to another peculiar attribute of the black box. Not only is the structure of the black box self-similar (i.e., it creates itself by almost replicating its own structure), but it also replicates its structure into any system with which it interacts. If we create a feedback between a black box and a system external to it, then the structure of the black box will be copied into the external entity. This means that the aspiration to achieve stabilization, and the possibility to destabilize and then re-stabilized the system in a different mode or a new order, is possible by utilizing the rules of the original mapping. The deeper reason for why this is so is the isomorphous nature of the logical structure, which is the self-same structure that created the phenomenon (any phenomenon). Only something that is there latently, or potentially if you wish, can be activated.

"Your picture is correct regarding the interaction of the mapping with the external and thereby defining the external that defines the mapping. You should know, though, that such a picture of your black box has tremendous beauty: it is symmetric in a very peculiar way. If you consider the black box and the external entity as two different systems interacting the way you suggest, then from a certain point on you can take any function, or any parameter that you use in both systems, and it will be a mapping in itself, similar in structure to your mapping. That is, any path made toward stabilization in this constellation can be looked upon as mapping... Both map the same system from different viewpoints. This is a kind of symmetry in different dimensions."

This method is aimed at changing the system from within the system's internal structure. We externalize the structure by turning it into "significance" (which is the black box) as a means to activate and control the system's internal structure. This operation is very subtle, employing the almost negligible infinitesimal tails to manipulate and re-create the system. It cannot be emphasized enough that control of the most prominent elements and parameters of the system is achieved by - what seems to be - the system's tiny, negligible and chaotic parameters. The big influence of a small, negligible perturbation - the butterfly effect - is a well known phenomenon in conventional non-linear dynamics and chaos theory. Perhaps, it is the most figurative illustration of our jargon (now there is someone we can blame for the last hurricane in Florida). Although such phenomena are indicative of small, random fluctuations creating dramatic appearances in complex systems, like the weather, they are not indicative of how to use such phenomena to control the weather. In conventional physics, non-chaotic, stable phenomena are not considered to be influenced much by small perturbations.

This conception changes, however, when we realize that even stable periodic phenomena come into being by stabilization of the underlying chaotic structure, and that through intelligently activating the infinitesimal tails (which are the traces and the means to activate the overall structure), we can control phenomena. Homeopathy, acupuncture, and other methods used in alternative medicine could also be indicative of the possibility of controlling complex systems (in this case, human physiology and psychology) by means of small, negligible influences. These methods, however, which are still somewhat controversial although also widely accepted, do not explain why they work and how to generalize them into more powerful methods of healing.

To demonstrate this idea, let's consider how the regularization of a physiological system creates the framework within which life can exist. This regularization mechanism is not only part of our physiology, but - as was shown previously - also guides our cognitive activities, our psyche as well as the interaction between our psyche and physiology. Life is the process of regularization (synonymous with the process of definition), not a collection of sub-systems participating in a process. The sub-systems and their constituent sub-sub-systems are just elements (significance, parameters) in terms of which the overall structure, the process of regularization and definition, is being realized. (Read more about regularization is Clara's article, The Loop Logic)

The principle of the black box suggests a new method of healing. This is how SHET put it:

"There are many different systems in the body, each having their own parameters, metabolisms, etc. All of them have to work well, each in itself, but that's not enough. They also have to work together as one system, one organism. As viewed by practitioners of Western conventional medicine, illness is in one or more sub-systems in an individual. And consequently, they try to fix that system, hoping the person will get well. You can take a different approach, which works much better, which fixes the overall system, and thereby, the particular system that is malfunctioning (in living organisms). Take several parameters from different sub-systems and make them work together by feeding the tails of one into the other to get all the selected parameters to become one stabilized system (not necessarily a sinus or fixed point, for it could be a stabilization that is like a strange attractor - remember the living organism has to interact not only with itself but also with the environment). Anywhere, in any environment where the system stabilizes (whatever attractor or chaotic oscillations around a fixed point), it is harmonious. That is, there can not be an overall parameter of how the system should be, only a structure of which harmonic dynamic the system should follow. As long as it does not explode but stays coherent (with enough pre-chosen parameters), you have done what you want."

As I mentioned earlier, there were those sessions that came out of the blue and created a new framework with which to think, which after quite a while unfolded into a more formal down-to-earth understanding. The previous session, however, demonstrates another aspect of the way SHET interacts with our world of ideas.

We were sitting in a café. At the time, I already had the mapping. My main effort was to develop algorithms in terms of the mapping to solve problems (I was working on how to constrain the mapping by proper boundary conditions in order to solve certain differential equations, for instance). We already had the general idea of how the structure of the mapping could replicate itself into external systems by interacting with them, but I was puzzled by the question of how to apply that knowledge and on what. I was looking for a system wherein the somewhat abstract general features were more important than its specific details, a system wherein the creation of correlations between its different parameters was more important than how the system created these correlations (anyway, how a complex system creates its correlations is not unique). I was looking for a system with the tendency to aspire to achieve balance and order, a system that would malfunction if part of its routes toward achieving the desired balance got stuck, a system complex enough that, when triggered, could find alternative routes to balance. While I sipped my coffee, human physiology came to mind as something that could fit all the above qualifications. I told Clara about this idea and argued that one could extract parameters like EEG, ECG, skin resistance, etc. from the body, and by extracting from these their infinitesimal tails one could try to correlate between them. I suggested using these parameters as the input parameters of our black box while taking some of its output parameters as a means to modulate an electromagnetic field, which would then be induced back into the body, closing the loop. This should create a higher correlation between the various sub-systems characterized by those parameters, which in turn would repair its malfunction. Of course, all this argumentation was based on the aspiration of the black box to achieve order and stabilization and its attribute of inducing its structure onto the system with which it interacted (in this case, the human organism).

I was not sure Clara understood the idea completely, and so a week later I returned to it. It looked then as if she had a revelation, as if she reinvented it, and then she came up with the above session. This session can actually be interpreted in several ways, and my above interpretation is merely one way. The session also implies that the black box structure is rather explicit in living systems, so the principle of the overall structure and the control of the system through its infinitesimal tails could be applied more directly, without using our external black box mapping as a control mechanism.

The ability of the structure to replicate itself into richer and richer expressions on different scales is the essence of self-organization and learning.

"What is self-organization? Creating a coherent significance? That's what most people believe. What's the difference between such a model and a more universally viable structure that can evolve and learn? Self-organization is not accidental, nor is it predetermined, but the creation of such structural integrity with such symmetry that can be homomorphous in its different transformations. Actually, learning is the carrying on of this aspect into richer and richer expressions on different scales."

And this is my cat, Sarastro: