

## Ring Determinism and Probabilism

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### Democritus-Bacon-Laplace's Tradition

Traditional determinism has at all times had a combative relationship with subjectivity. Therefore, all categories of knowledge related to the latter, were poorly represented by the former. Among these, is the category of probability or "chance". *Ring Determinism* resolves this conflict by clarifying its principles.

Ancient Greek philosophers demonstrated a tendency to divide all judgments into "true of Nature" and "opinion of mortals" (Parmenides). As to the first, a prevailing basic principle of absolute determinism was recognized. Each subject and its phenomena have a stringent causative grounding, fully definite and regular. With regard to the second, the element of relativity and indeterminacy was supposed. Democritus quite unambiguously spoke on this subject: events whose causes we do not know seem to be random. Here, the manifestly subjective human condition of "chance" and its rather unsteady ontological status is indicated.

This observation by Democritus (and its many variations,) was later elaborated by F. Bacon, T. Hobbes, B. Spinoza, R. Descartes, Z. Lamettrie, P. Holbach, D. Tolland, A. Collins, J. Priestley and especially P. Laplace. His hard line approach resulted in it's being called "absolute determinism".

These great materialists simultaneously banished "chance" from the world of objective nature. They considered determinism to be strictly representative of Nature and they left no place for doubtful categories. The status of the subjective world in materialism was uncertain. Therefore, "chance" was left helplessly swinging in air.

Let's try to recollect the synonyms of relating to chance: unexpectedness, contingency, unplannedness, unpredictability, randomness. The subjective character of all these terms is quite obvious. The act of disassociating any event and its actualization by the subject occurs. It was just the subject who "did not expect, did not plan, has not scheduled, has not predicted" the given event. It is important to underline that is not the problem of an event which occurs irrespective of the subject. It is in a pure form *the problem of the subject* who **can not** or **does not know** how to foretell it by virtue of specific causes.

In a classical experiment with the throwing of a coin, the chance occurs because the *thrower* and the *witnesses* can't reliably predict the outcome. The person is not capable enough to precisely measure the muscle effort required to reach the desired outcome. Therefore he cannot specifically ensure this or that outcome. However, if the thrower of a coin attaches precise enough sensors, this outcome can be predicted precisely up to the moment of its fall. The motions of arm and coin are routine mechanics strictly subordinate to determinism and fall under precise calculations. As to the widespread notions about chaos as absence of any order, this is a naive error. Chaos is an absence of order at only a relevant level of understanding. This absence

is always indemnified by a stringent determinancy, which is not apparent at our level. Analogous reasoning is usable in all similar "random" situations.

### Chance in the bi-causal world

Within the framework of the concept of Ring Determinism, any living organism receives the status of a causative autonomy in relation to the remaining world of the Nature. Its internal physical world develops under laws of two determinisms: customary and ring. Actually it is necessary to bind to any organism, a special *bi-causal* model of the world. Necessity, safely and with favour for itself to interact with an external world, puts an organism before the problem of building an *algorithm of successful conduct*. By the development of this algorithm, it is inevitably necessary to take into account a number of objective characteristics of the world of surrounding objects. Actually the organism should *forecast* a forthcoming situation and for this purpose *to model, reconstruct* an external world by means of the internal controlling system.

At miscellaneous levels of organization of organisms this problem is decided variously: from making primitive reflexes and instincts to creation of the composite models of mind. However, the general principle remains unified: while the situation develops within the framework of a model and algorithm designed by subject - organism, it is considered, that determinism reigns. As soon as the situation leaves this framework and starts to develop in a non-standard way, an unexpected discomfort takes place. If within the framework of a subjective, there is no argument to this discomfort and it is considered a chance occurrence.

Such happens quite often. This problem leaves us rather uneasy, especially if we take into account the fact that the world around us is immense, and the organism is rather narrowly limited, localized in space and time. Here it is necessary to recollect Nicolaus Cusanus who compared the person to a *microcosm* which reproduces ("subtends") in itself, the huge world of an ambient nature. This microcosm creates inside itself and for itself *a similarity* with the universe, that of an infinitely large world.

Actually, any organism comprehends the world in a centrifugal mode, being guided by the logic of induction: that the model of the world and the algorithm of successful conduct which is checked by him locally and *a priori*, is extended to all the surrounding world. Here, it is a nuisance to see that the external world always proves much more complicated than any models and schemes.

It is necessary to recognize as a synonym of a chance, the "failure as an error of forecasting". A specific field of application of the category "chance" is located in the space and time of the world of an organism or a similar self-organizing system within an adjacent part of the environment. Only here, errors of forecasting are committed. Only here, on the border of spheres of influence of two versions of determinism, conflicts arise. Therefore, chance can be estimated also in the capacity of specific effects in the clash of two determinisms.

It turns out that it is possible to probe even in such a specific borderland. Such instruments of subjective knowledge as *the probability* and *reliability* help to orientate oneself in the world of chance. John Locke was right when spoke, that *the probability compensates for the lack of knowledge*. These instruments, we emphasize, are relevant for an organism only within the framework of the aforementioned specific boundary world. Outside its limits, in the areas completely controlled by one of two determinisms, they have no sense and value. The same as chance, they are missing in a well-ordered part of the inner life of an organism and in all the remaining external natural world.

If philosophers, objectivists, materialists and theologians, in every possible way, ill-use the category "chance", then any kind of philosophers - subjectivists, to the contrary, in every possible way, glorify it. In a situation of opposition of two determinisms, they rely wholly on the internal world and consequently, are inclined to mentally extend its regularities outside the limits of the world of the subject; to apply to the remaining world, the specific properties of a local (ring) determinism. They exaggerate the role and scales of the subjective world of the person and aspire to give chance the status of an objective category, to extend the sphere of its application outside the limits of the inner life, to all of the external world.

Before the occurrence of the concept of Ring Determinism in philosophy, there was no clear idea about the substantial parallel co-existence of two comparatively independent physical worlds with their own special versions of determinism. Therefore there was an imminent confusion, and philosophers frequently aspired to climb into this or that field with inappropriate yardsticks of determinism. With Ring Determinism, all goes to the proper places.

Among a flock of doctrines of philosophical subjectivity there is *philosophical skepticism*, engendered in Ancient Greece and modified today into some schools having positivistic tendencies.

The tendency is characteristic of the modern positivists to a maximum degree, to concentrate on directly observable empirical outcomes and on the descriptive theoretical apparatus built on them, minimally resorting to metaphysical reasons of mind - detailed definitions of on-hand situations instead of causative arguments. A characteristic example: if we place the positivist in a classical situation "the black cat in a dark room" he without the slightest doubt, will insist on the absence of the cat, until he treads on the tail of the poor creature. An empirical situation "there are no data about the cat" he automatically transfers into a cognitive - behavioral position - installation "the cat does not exist". As soon as the cat emits a wail, the situation swings to the other: "there are data about the cat", and the position - installation, there and then, swings to the contrary - "the cat exists". Agreed that this is a rather meager methodology. From this, it is not too far up to a primitive "cut-and-try" method which in Ancient Greece was absolutized marginally by skepticism.

For a comparison, the materialist in such situations will suppose the existence of the cat, he will believe in its possible reality, therefore will start to seek indirect methods for detection of its presence and will not jump to conclusions before obtaining reliable data. Some take the "active" position of the positivist and accordingly, will not have the "indecision" of the materialist. However it is necessary to note, that in the event of the presence of the cat in a room, the initial position of the positivist will be 100 % in error, with all the consequences implied.

Positivists absolutize an available empirical situation, are satisfied with that empirical luggage that is, for today. For them, the substantial, independent outlook of the existence of a material world is a redundant theoretical assumption. Therefore for them, the fact of co-existence of two determinisms and the limitation of a sphere of application of the category "chance" ensuing from it, is inadmissible. They are ready to apply this category without distinction to everything that is observed by them.

### **The situation in the physics of a microcosm. Temporary triumph of a positivistic methodology**

It was necessary to concentrate specifically on one aspect of positivism to better understand the epistemological situation accompanying the development of physics in the XX century. Actually, it is necessary to establish the fact of a temporary triumph for positivism. I shall not

dwell on the frank positivism of the Relativity theory here. It is material for another article. Here, it is necessary to dwell on the positivistic tendency in the methodology of modern physics in the microcosm as it affects the category of "chance". As a critical entry point of physics on the position of the methodology of positivism, it is necessary to recognize the act of absolutization *of uncertainty, or indeterminacy* principle (indeterminacies, correlation) of Heisenberg.

For not too dedicated in essence of an affair I shall shortly explain. We shall assume we are given the task of measuring parameters of motion (coordinate, speed, impulse, energy ...) of any body. In our routine macro world it is easily implemented: it is possible to determine all this by sensors or visually, in light beams reflected by a body. Interaction with these sensors and with an incident beam does not influence a macro body; therefore, it is possible to measure to any degree necessary.

Essentially, a different situation applies in a microcosm. Here, to make similar measurements, it is necessary to probe a micro particle in interaction with microparticles of the same scale, which are placed in our measurement devices. It is almost the same as if we probed the motion of a flying stone by throwing other stones of the same size at it. Clearly, the first such measurement simply "knocks our micro particle out of the saddle", and inevitably *distorts* the initial parameters of its motion, and it will not be possible for us to make *the second precise measurement*.

The situation with only one precise measurement in a situation with subsequent distortions in each act of measurement greatly complicates any activity in probing a microcosm. For the definition of some important physical quantities and parameters, one measurement is insufficient. For example, to speak about a small fraction *of a motion-path* of a micro particle, *two* precise measurements (two coordinates or coordinate + impulse) are a minimum requirement. It turns out that precise attempts to map a trajectory and similar things, is exceedingly difficult. If the methodology of materialism prevailed in physics, apparently, it would cause "a problem with the second measurement".

So, the uniqueness of the situation in describing events and processes in a microcosm will show the *impossibility of establishing* precise values for some combinations of quantities and parameters. Here it is – the border zone of two determinisms: subjective (internal, ring) and objective (external, linear)! Here, chance and probability eminently appear in the foreground. To physicists, there remains the problem of how to offer a substitution for determining precise values of interesting parameters through special schemes of probabilistic distributions of their values in space and time.

Now instead of the statement "the particle is at point X at instant t," it is necessary to say, "the object can be in various places in some designated spatial domain within the limits of some designated time-slice with various probabilities of which value can be calculated, proceeding from a special map of distribution presented in a matrix of some kind". Too difficult for the ordinary mind? Unfortunately, there is no other way to describe the situation. Such is the harsh reality of a border zone.

Honor and praise to the great physicists of the XX century! However they too are people, same as we. And weaknesses are peculiar to them too. One of them is the tendency to exaggerate the meaning of their own vision of the world. And as the vision of the microcosm for physicists today is mainly probabilistic, they aspire to present their own probabilistic descriptions in the capacity of the real situation in the microcosm. For example, being incapable of making the second precise measurement and to reconstruct a precise motion path of a micro particle, physicists have decided to consider that *the trajectory does not exist at all* (!). There are also all

the other objective characteristics, parameters and their combinations that require two or more precise measurements! Instead of them physicists offer us the descriptive maps of probabilistic distributions by which they effect calculations.

Here it is already necessary to say to physicists “ Stop guys! You have climbed out of the range! It is one matter – descriptive models of reality in which you are strong, and another matter – the reality in itself. One cannot be confused with other. Imagine if geographical map-makers would demonstrate the same ambitions. They will absolutize their maps of districts and, maybe, even force you to move your dwelling if it does not coincide with their drawing!

Philosophers-materialists should say today to physicists: weakness of your descriptive methods is your subjective problem, *a problem of submission* of events of an external world to the inner life of the subject. It is not a problem of nature, not a problem of the microcosm. If you are not capable of making two precise measurements in a row for a micro particle, the trajectory should not disappear. In its world, essentially nothing varies because of your weakness. The objective world exists in itself, irrespective of methods of our probing and our description. It is an unconditional element of belief and a basic requirement of common sense and materialism.

It is necessary to specify that the physics of the microcosm is only *one special section of physics*, and should supplement the remaining structure of physics instead of running counter to it. Another special section is presented, for example, by statistical physics. It works, not with separate molecules and atoms, but with large statistical ensembles. Thus, it is necessary *to abstract* one's mind from the existence of separate particles, to knowingly remove them from consideration. This is dictated by reasons of convenience, of submission of the information and economies of exploratory forces. Actually, separate particles in statistical physics simply do not exist. However these physicists not so are ambitious, as quantum physicists. They do not attempt to negate the existence of substantial particles in a nature.

*Specificity in quantum physics will consist in abstraction from precise values of some combinations of parameters of microparticles.* It is a question of a unique cognitive situation when the capability to receive information on events in a microcosm in all desirable completeness *is limited in principle*. Physics is compelled to rectify this defect (we shall recollect Locke's above-stated remark) with probabilistic distributions of the parameters. But it does not give the right to these particular experts to negate the substantial existence of precise values. In the light of the above, it is necessary to recognize the uncertainty principle of Heisenberg as only a computational convenience for physicists and not as a basic principle of Nature. So, to us lies ahead the need to patch in the XXI century, this quirk of a philosophical and physical idea of the XX century.

A similar situation develops on other borders of physical knowledge of the world – in cosmology. Here too as it happens, it is impossible to get the total volume of desirable information about an event or object. In the limitation of direct data retrieval, physicists stand before the problem of the gaining indirect information. In some aspects, probabilistic methods are appropriate. It is necessary for theorists to make many guesses for the clarification of a situation. If positivistic methodology and philosophy will prevail here, it is necessary to refuse consideration of not-directly observable things, such as “ black holes” and very much distant objects.

If we criticize physicists, it is necessary to add the following. I would call the condition of modern physics of the microcosm as in a raw state. Today, we have quantum and matrix ways to describe the phenomena of the microcosm. Two not entirely bad, working, *descriptive methods*. But there is no *method to explain*! Strictly speaking, a complete and proper mechanics does not

exist as yet. There are two convenient methods or parallel versions for calculation of the kinematics of the microcosm. Ask any physicist: why two electrons in one atomic orbit cannot have an equal “spin”? And he at once will answer you: so *the application of the Pauli principle demands it*. The physicist Pauli is placed in the role of a demiurge? Funny, but it is a fact. The description is used instead of an argument.

A similar situation, in my judgment, was already in physics – before the mechanics of the Newton. At that time, descriptive methods reigned too. Astronomers compiled tables of positions of planets of the Solar system. Physicists attempted to find in them simple invariants. The most far-reaching of the then known kinematics were Kepler's laws. These were interesting, but inexplicable regularities in the motions of planets. And only with coming of the great Newton was born the complete, rigorous, classical mechanics with its causal-force substantiation.

I think, the full rigorous mechanics of the microcosm waits for us in then not-so-far future. Enough material has been accumulated. It remains only to wait for the coming of the new Newton. And may Ring Determinism aid him!