

## **Some aspects of quantum mythology**

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### **Abstract**

The word *myth* represents the area of reference that is claimed as their own by folkloristic, anthropology, sociology, psychoanalysis, as well as philosophy, religion, and the fine arts. It is hard to define myth, as it is not reducible to a text; yet it cannot be left undefined either. Thence, it seems that myth can satisfactorily be explained only by itself. Here we can see an analogy to the classical physics, where the value of a certain characteristic must sometimes be calculated formally by the other characteristics, although it exists independently from these other characteristics – e.g. calculate the mass of a body by force and acceleration. Yet, in quantum mechanics we have an opportunity to calculate physical characteristics via themselves, using their eigenfunctions. This gives birth to an idea to explain myth via itself, using formalism similar to that of quantum mechanics. This article tries to find analogies between quantum mechanics and mythology, using as an analogy to the Euclidean room an axiological room with ethics, aesthetics, and pragmatics chosen to be the coordinate axes on the current case. In that way, it has turned out to be possible to find interesting analogies to the physical characteristics in quantum mechanics. The quantum mechanical theory of measurement seems to be a good analogy for description of the relations between myth and text. In the article, the necessary premises and a preliminary framework for the creation of quantum mythology have been outlined. The author does not claim that quantum mythology that is thus provided would make it possible to explain the nature of myth, but even a furtive application of this theory provides us an original approach to several problems in mythology, e.g. the problematic of influenciality, persistence and speed of spreading the myth.

### **Abrégé**

Le mot *mythe* représente la zone de référence qui est revendiquée comme la sienne par des folkloristes, des sciences humaines, de la sociologie, de la psychanalyse, ainsi que par la philosophie, la religion, et les beaux-arts. Il est difficile de

définir le mythe, car il n'est pas réductible au texte, et pourtant, il ne peut pas être laissé indéfini. Alors il semble que le mythe ne peut pas être expliqué de façon satisfaisante que par lui-même. Ici, on peut voir une analogie dans la physique classique, où la valeur d'une caractéristique est parfois officiellement calculée par les autres caractéristiques, et bien qu'il existe indépendamment d'autres caractéristiques – p.ex. on peut calculer la masse d'un corps d'après la force et l'accélération. Pourtant, dans la mécanique quantique, nous avons la possibilité de calculer les caractéristiques physiques par eux-mêmes, en utilisant leurs propres fonctions. Cela donne naissance à l'idée d'expliquer le mythe par lui-même, en utilisant un formalisme similaire à celui de la mécanique quantique. Dans l'article, nous avons essayé de trouver des analogies entre la mécanique quantique et la mythologie, en utilisant une analogie à l'espace euclidien d'un espace axiologique avec l'éthique, l'esthétique et la pragmatique choisi de l'être sur les axes de coordonnées dans le cas présent. De cette manière, il a été jugé possible de trouver des analogies intéressantes pour les caractéristiques physiques de la mécanique quantique. La théorie de la mesure de la mécanique quantique semble être une bonne analogie pour la description des rapports entre le mythe et le texte. Dans cet article nous avons décrit les prémisses et un cadre préliminaire nécessaires pour la création de la mythologie quantique. L'auteur ne prétend pas que la mythologie quantique permettrait d'expliquer la nature du mythe, pourtant même une furtive application de cette théorie nous donne une approche originale de plusieurs problèmes de la mythologie, p. ex. la problématique de l'influence, de la persistance et de la vitesse de propagation du mythe.

The word *myth* refers to an area of meaning claimed theirs by folklorists, anthropologists, sociologists, psychoanalysts as well as philosophers, researchers and practitioners of religion and artists. One can find several different approaches to the concept of myth from the history of research into myth: myth can be seen as allegory (Theagenes); twisted history (Euhemeros); childish deceit (Platon); literature (Aristoteles); personification of the forces of nature (Fontenelle); bearer of man's dignity (Herder), myth=myth, a blueprint for history (Schelling); disease of language (Friedrich Max Müller); proto-science (Andrew Lang); the result of opposing individualist

and collective categories (sociologists); symbol (symbolists), the verbal counterpart to rite (ritualists, e.g. Hyman, 1955); principle of structure (structuralists); the public expression of important states of mind (psychoanalysts); fiction (analytic philosophers), etc. Definitions of myth have been attempted on the basis of what myth is not (Lossev, 1991) and through how myth as a distinct non-communicated part of the worldview functions. Myth has been treated as refined lie or false propaganda (Douglas, 1953).

Different encyclopaedias and handbooks define myth first and foremost as text or traditional text (Spence, 1994: 11). This is – as a bad example – a conclusion in the spirit of science: completely correct while useless. Researchers into myth also prefer views, according to which myth is not text and that the phenomenology of myth is impossible (Panikkar, 1989: 212). This in turn is – again, as a bad example – a conclusion in the spirit of the humanities: very smart while completely futile. One can't define myth, yet it cannot be left undefined either. The present article was written from the point of view of a metaphysician rather than that of a physicist. There are several reasons for this:

i) a metaphysician has no obligation to be wise (a sophist) as a physicist does;

ii) a metaphysician has to be competent in asking questions rather than in answering them;

iii) a metaphysician may compose speculative schemes without experiments to ground them (doing proper experimental research is complicated and time-consuming while precludes the help of competent specialists in myth).

According to the classical scheme of definition, myth has time and again been explained with the help of other concepts as if myth could be a specific term in relation to a more general generic term (a kind of text, a kind of science, e.g. primitive science etc.). Such definitions have successfully been parried by Lossev in the 1920–30s. The author of the present article has come to favour Lossev's view that myth can satisfactorily be explained only by itself.

**Question 1:** Are there any possibilities to explain myth through itself and where to look for such possibilities?

**Answer 1:** A similar situation can be found in classic physics, where the *value of a quantity* sometimes has to be calculated through other quantities, although the quantity sought itself exists independently of the *auxiliary quantities*. For example, mass is calculated through force and acceleration using Newton's second law. It is makes sense to calculate the acceleration of a body through force and mass

$$a = F/m \quad (1)$$

where  $a$  stands for acceleration,  $F$  is force and  $m$  is mass. Thus it is possible to calculate the mass of a body with the help of the following formula:

$$m = F/a \quad (2)$$

Formally, everything is in order, but the content of formula (2) differs remarkably from the content of formula (1). While in formula (1), the acceleration of a body is truly proportional to force and inversely proportional to mass, then in formula (2), mass depends in no way on force or acceleration – it just has to be formally calculated through force and acceleration. Sometimes, this kind of approach may even be disturbing, for example, in case we calculate the impulse of a body  $p$  through the *product* of its mass and velocity:

$$p = mv \quad (3)$$

where  $v$  stands for velocity. In cases corresponding to formulae (2) and (3), one is tempted to find ways to calculate necessary values through themselves for their values make sense even without the quantities needed to calculate them. Thus, one might ask in classic mechanics as well as in mythology: what possibilities are there to calculate a value through itself?

Such possibilities exist in quantum mechanics, there the possibility to calculate values through themselves rather than through other values is quite often used. Thence the idea of the answer: perhaps it is possible to explain myth by itself using a formalist method similar to that of quantum mechanics (QM). The resulting formalism in mythology could be called quantum **mythology** or the quantum theory of myth (QMy).

**Question 2:** In the quantum theory of myth (QMy), how should one seek the analogues to the physical quantities of quantum mechanics (QM)?

**Answer 2:** In the present article, the principles of quantum mechanics are touched on as briefly as possible. More thorough accounts are available, e.g. Piron (1976) and Hughes (1988). In QM, the operator  $\mathcal{F}$  is set in correspondence with the physical operator  $F$ .

$$\mathcal{F} \Psi_n = f_n \Psi_n \quad (4)$$

where  $\Psi_n$  is an *eigenfunction* and the equation has determinations in case of certain *eigenvalues*  $f_n$ . The eigenfunction is a non-trivial determination of the eigenvalue equation in case of an eigenvalue, which gives the eigenvalue equation a determination in the first place. The spectrum of eigenvalues may be continuous or discrete. In QM, the operators have to be linear. (Let us assume this for a while.) In addition, the operators have to be real, non-imaginary.

In quantum mechanics, the particle is represented with the state function  $\Psi(r,t)$ . The state function is normalised in the following way:

$$\int |\Psi(r,t)|^2 dV = 1, \quad (5)$$

thus the probability of finding the particle  $|\Psi(r,t)|^2 dV$  in a space element is  $dV$ .

Let us try to view myths in quantum mythology as consisting of elementary myths or mytologemes *EMy*. The

elementary myth can be presented as the state function  $Y(r,t)$  over a space  $\rho$  at a fixed value of the time-resembling parameter  $\tau$ , while  $|Y(\rho,\tau)|^2 d\rho$  gives the probability of finding  $EMy$  in the space element  $d\rho$  in case of a certain  $\tau$ .

Quantum mechanics was not made meaningful by formalism as such but rather by meaningful content given to the form. Quantum mythology would not have any heuristic power, if we used physical space and time, for myths are not located in space and time like physical objects. What would be the analogue of physical space and time in quantum mythology?

In order to find an answer, we will turn to classical logic. There are at least two ways of defining a concept:

i) a verbal definition (classic definition, genetic definition);

ii) ostensive definition (immediate or indirect).

It is generally thought that we can define only concrete and not abstract concepts in this way. Indeed, one can ostensibly explain a child what *dog* means by showing all manner of dogs and pictures of dogs. But is there an ostensive way of showing a child what is *honesty* or *goodness*? Yes, by telling stories, fairy tales, and myths. A story allows us to refer to abstract concepts. Here one gets the feeling that myths might be related to axiological abstract concepts. What are the operators of axiological modal logic?

**Axiological** modal sentences express judgment. Value is a term signifying the qualities of objects that are either positive or negative from the point of view of a person (subject), group or society.

The linguistic expressions of axiological modality are *absolute* or *relative* judgments of preference: *it is good that...*, *it is bad that...*, *it does not matter that...*, *it would be better if...*, etc.

The logical structure of a judgment consists of the following elements:

- the subject of the judgment, i.e. the person or group conducting the judgment;
- the matter of the judgment, i.e. the judged object, subject or phenomenon;

- the character of the judgment, either absolute or relative;
- the basis of the judgment, i.e. the viewpoint from which the judgment is made.

The intervals of axiological values could be treated as distances, but what would they measure? Absolute good in the one end of the axis, absolute evil in the other, neutral in the zero point. But what could it be that we study in this way?

First and foremost, it might be an ethical judgment of value. However, in physical space, there are three dimensions. How many should be sought in quantum mythology? Shall one suffice? The author's firm opinion is that even one-dimensional tasks should certainly be solved. But axiology allows us more dimensions, e.g., a three-dimensional model, the axes of which could be **ethics, aesthetics, and pragmatics**. Again, we face a host of interesting questions (e.g., whether and how these axes cross one another). However, in some approximation the model is usable. When necessary, one-dimensional models for aesthetics and pragmatics can be used, and also, two-dimensional models are an option.

When building something new, one should use as much analogy as possible, for certainty's sake. In quantum mechanics, the operator of the co-ordinate coincides with the co-ordinate. Let us apply the same for now. What parameter should be analogous to time? In mythology, time of many different sorts is used, none of which is completely appropriate here. Of course, other possibilities should be researched, such as the uses of sacred and profane time (Eliade 1992) but one of the most interesting candidates for a parameter similar to time in quantum mythology could be the passage of generations. Myth is stationary in the generational moment, as is the physical quantity in time. Myth alters to a significant degree when there is a change in generations. The emotional influence of myth could correspond to the operator of the impulse; likewise, the ability of myth to influence individuals' judgments of value could correspond to the Hamiltonian or the *operator of energy*.

**Table 1.** Comparable quantities in quantum mechanics and quantum mythology

QM	QMY
Physical 3-space	Axiological space (ethics, aesthetics, pragmatics)
Physical time	Passage of generations
Impulse	Emotional influence
Energy	The ability of myth to change judgments of value

**Question 3:** What kind of tasks will such formalism help solve?

**Answer 3:** A typical task of quantum mechanics is to describe the temporal behavior of the quantum system. If a particle described by means of the state function  $\Psi$  is stable, the situation is described by means of the *first-grade* differential equation

$$\partial\Psi/\partial t - \mathbb{L}\Psi = 0, \quad (6)$$

in which  $\mathbb{L}$  is a linear operator. Generally, this operator cannot be derived – it has to be determined through experiment. Continuing the analogy, if one assumes that the state function of myth resembles the wavefunction of de Broglie, we can use an equation analogous to the Schrödinger equation:

$$i\hbar_m \partial Y/\partial \tau = \mathbb{H}_m Y, \quad (7)$$

where  $\hbar_m$  is the Point-Planck constant, an analogue to the Planck constant, and  $\mathbb{H}_m$  is an operator corresponding to the Hamiltonian or *the operator of energy*. For a particle that moves in an outside field, the Schrödinger equation should be noted in the following form:

$$i\hbar_m \partial Y/\partial \tau = \left[ -\left(\hbar_m^2/2m_m\right)\Delta + U_m(\rho) \right] Y, \quad (8)$$

in which  $m_m$  is the analogue to mass,  $\Delta$  is the Laplace operator and  $U_m(\rho)$  describes the external field potential. The external field could be the external pressure to judgments of value. EMy mass is the measure of its inertia against axiological *drifting acceleration*. The stability of myths corresponds to the conservation of energy, myths come into being and disappear due to external pressure. For example, the myth model of a stable community can be treated as a hydrogen-like atom, etc. The Point-Planck constant has to be determined separately. Myth can be seen as a discrete phenomenon, for its change can be considered non-continuous and determining the Point-Planck constant is very important. After it is determined, we may start research into the possibilities of describing the Heisenberg uncertainty relation within quantum mythology. Uncertainty applies in quantum mechanics between the energy of quantum state and the lifetime of the state:

$$\Delta E \Delta t \geq \hbar/2, \quad (9)$$

where  $E$  stands for energy. The analogous formula in quantum mythology would be the following:

$$\Delta E_m \Delta \tau \geq \hbar_m/2. \quad (10)$$

The relation presented in (10) is very interesting, for an interpretation of it says that the shorter the lifetime of a myth, the worse is the influence of a myth with finite lifetime *defined*.

**Question 4:** How are myth and text related?

**Answer 4:** Here, the measurement theory of QM comes handy. The interaction of the myth with its narrator during the narration gives us a text (which ostensibly defines axiological concepts and also gives them judgments). An interesting problem here is constituted by the cosmological scenarios in mythspace. In an application of the measurement theory, one has to be very careful. It seems that in quantum mythology, the reference, meaning and sense of an expression in the sense of

Gottlob Frege may easily be confused. Getting accustomed to thinking in the axiological space is not easy.

**Question 5:** What do we achieve with this kind of formalism?

**Answer 5:** The present article merely drafted the outlines of quantum mythology. Applying the theory in concrete contexts is a task of science rather than that of philosophy. However, a definite example will be presented below.

Quantum mythology gives us an opportunity to treat myth from a slightly different point of view. For example, the necessity to speak about the mass of AMY allows us to distinguish between mythologemes with different mass: Cosmological primal myths with huge mass (bosons, e.g. the Higgs boson), intermediary everyday myths (leptons and quarks) as well as zero-mass young myths (photons) that can exist only when moving with the speed of light. Perhaps this is the reason why rumours spread very fast?

**Conclusion:** Quantum mythology is an attempt to analyse myth quantitatively and developing a coherent method is possible using the analogue of quantum mechanics. Quantum mythology offers us the possibility to study myth from a new point of view and creates an opportunity to analyse myth through itself quantitatively.

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