

Dedicated to [Ernst Paul Specker](#)

http://www.god-does-not-play-dice.net/Ernst_Specker.pdf

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Subject: Re: [The "cloud" of contextuality](#)
 Date: Fri, 18 Jan 2013 04:55:05 +0200
 Message-ID:
 <CAM7Ekx=g00uAjJjKOi-3dfg_X0b0QqmOxF1qL98_wukDjwjrOw@mail.gmail.com>
 From: Dimi Chakalov <dchakalov@gmail.com>
 To: [snip]

Dear colleagues,

No reply has been received to my email sent two weeks ago.

Meanwhile, I tried to explain [the issue](#) at

<http://www.god-does-not-play-dice.net/#Klauder>
<http://www.god-does-not-play-dice.net/Klauder.pdf>

Please send me your professional opinion.

The issue is indeed well-known, since 1935. The latest relevant reference in the text above is from Ernst Specker regarding the "Infuturabilien" (Die Logik nicht gleichzeitig entscheidbarer Aussagen, *Dialectica* 14, 239-246 (1960); [p. 243](#)). Professor Specker was also associated with ETH Zurich, and acknowledged the receipt of my proposal on Wed, 20 Apr 2011 18:41:44 +0000.

Unfortunately, he left us eighth months later. God bless his soul.

We must restore the heritage of [Ernst Paul Specker](#).

Looking forward to hearing from you at your earliest convenience,

Sincerely,

Dimi Chakalov

On Fri, 4 Jan 2013 15:15:08 +0200, Dimi Chakalov <dchakalov@gmail.com> wrote:
 [snip]

Note: Three weeks after my email [above](#), I still haven't received any answer. Perhaps these people simply can't understand the meaning of [Infuturabilien](#) in Ernst Specker's article ([p. 243](#)). Let me help.

Unlike [Bell's argument](#) [[Ref. 1](#)], the Kochen-Specker theorem does not depend on separability and/or locality assumptions. The issue is not about "correlations" nor "[noncontextual hidden](#)" (whatever), and has nothing to do with Bell's argument which **cannot** display the noncolorizable UNSpeakable *pre-quantum* [Kochen-Specker states](#).

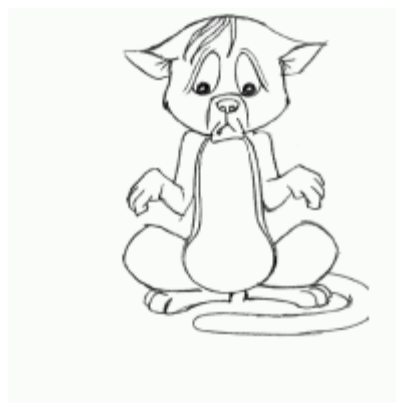
They show up in a Hilbert space of more than two dimensions: it is *in principle* [impossible](#) to 'color' with 0's and 1's without violating orthogonality constraints and obtain "consistent predictions about a quantum mechanical system" ([Ernst Specker](#)), because the noncolorizable "quantum states" of [[whatever](#)] are **neither** "quantum" **nor** "states". They do not pertain to *anything physical*, hence cannot fit in any Hilbert space [whatsoever](#). It does **not** matter whether we would change the "context" and "multiply them in different order" (see [above](#)), because all permutations of possible sequences/orders of multiplication will **always** show the same number of noncolorizable "quantum states" of [[whatever](#)].

The issue here is that the permutations of possible cases of "context" (see [above](#)), introduced with all possible sequences/orders of "multiplication", will demonstrate with certainty that **all** quantum "states" can switch from physical, colorable quantum observables to **unphysical**, noncolorizable "quantum states" of [[whatever](#)], and back. To explain this fundamental quantum phenomenon (which cannot be demonstrated with Bell's argument), let me simplify it by introducing three quantum guys, Tom, Dick, and Harry. They have three degrees of freedom by raising their hands upon observation: only left hand [L, up], or only right hand [R, up], or both hands [up, up]. Thus, if Tom becomes colorable quantum observable in particular "context" (see [above](#)) with [L, up], Dick and Harry have to pick up the remaining alternatives for this "context", **but** if Dick chooses [R, up], Harry **will have no hands** and will **not** become colorable quantum observable. If at some other *instant* (as measured with your macroscopic wristwatch) Harry chooses to raise both hands [up, up], and Dick chooses [L, up], then Tom **will have no hands** and will have to stay in the initial **unphysical**, noncolorizable "quantum states" of [[whatever](#)], from which the three quantum guys *evolved* by changing the "context".

Perhaps the simplest explanation is offered by [Chris Isham](#): "the implication of the discussion above is that the value ascribed to B (resp. the result of measuring B) depends on whether it is considered together with A1, or together with A2. In other words the value of the physical quantity B is *contextual*." In our parable, the quantity **B** will show up with different combination of "hands", and will **not** have any pre-existing "state". To explain this crucially important situation, suppose we identify the three quantum guys by their raised hands, say, Tom has only [L, up], Dick has only [R, up], and Harry can only raise both hands [up, up]. Then the fundamental feature of Quantum Theory is that at any *instant*, as measured with your (inanimate) wristwatch, one of the guys **will have no hands**, because at *this* instant he will remain **confined** (remember [quarks](#)?) in the **unphysical unspeakable noncolorizable** pre-quantum [[whatever](#)], from which the three quantum guys *evolved* by changing the "context".

Generally speaking, the notion of *potential reality* can be parameterized with the variable [[psi](#)] from the Potential Reality ([PR](#)) interpretation of QM -- in the case of {Tom, Dick, Harry} [[psi](#)] equals 3, while in the case of 'spin up/spin down' [[Ref. 1](#)], [[psi](#)] equals 2. Yet in $\dim(H) \geq 3$ some percentage (Helena Granström, [p. 2](#)) of all possible explications may have [[psi](#)] **zero**, similar to 'the ideal monad *without windows*' or Kantian thing-in-itself (*das Ding an sich*). Notice that *potential reality* is practically *non-existent* in classical mechanics; in QM **it** can be proved for only *one* instant of "joint probability distribution" in $\dim(H) \geq 3$; and in [QCD](#) **it** holds *permanently* in the form of [quarks](#) and "[god particles](#)". The quantum vacuum is a special entity of its own, because its [[psi](#)] is *not* determined: it has [[psi](#)] **zero**, *i.e.*, no "real particles".

Also, the Potential Reality interpretation of Quantum Mechanics introduces actualization or rather *physicalization* of **one** potentiality with **certainty** at the instant 'now' from the Arrow of Space -- **one**-at-a-time, and with unit probability current. The rest of potentialities -- all but **one** -- don't matter, because they have become at *this* instant noncolorizable and 'have no hands'. In other words, the explication of **one** colorized "jacket" -- one-at-a-time and with unit probability -- is the essence of PR interpretation of QM. It is depicted with the first photo below, as opposed to the postulated "collapse" in the orthodox interpretation of QM (recall that all "superposed cat states" are supposed to "evolve" in some "absolute Newtonian time", denoted with **t** in the Schrödinger equation).



People try to obscure 'the ideal monad *without* windows' and the case of 'one of the guys will have no hands' with phrases like "quantum value indefiniteness", as if they could in principle suggest **any** value -- you name it -- of the "uncolored" [whatever], only in the case under consideration the "value" has miraculously become "indefinite". But they *cannot* suggest **any** value whatsoever, because *any* value will be necessarily *physical*, hence colorizable. For example, the notion of 'zero *something*' (such as "dark matter") pertains to a *physical*, and hence colorizable stuff (say, I claim there are zero bananas in my ears), while the noncolorizable [whatever] is opposite to 'zero *something*', and should be 'zero *nothing*'.

Also, the question of whether one can use some "hidden variables" to explain the noncolorizable [whatever] presupposes that some "hidden" quantum stuff may **physically exist** in the first place. If so, we would be able to calculate the number of blond quantum angels that can fit on the head of a pin, and explain, for example, the "hidden" physical basis of spin (Hans Ohanian). But even if such hidden *physical* stuff were possible to exist, it will be colorizable, as we could at least *talk* about it. However, in the case of the Kochen-Specker theorem we can't show anything physical whatsoever: the noncolorizable [whatever] does not *physically* exist.

To cut the long story short, if we denote the **unphysical unspeakable noncolorizable** pre-quantum [whatever] with 'John', **it** (not He) can be symbolically presented, along with its localizable, physical, EPR-like entangled and correlated 'jackets' cast from **it** on the 'curved wall of the cave', as

John <--> jackets.

This is the essence of Quantum Theory in $\dim(H) \geq 3$, after [Kochen-Specker](#) and [Gleason's theorem](#). There will be always "probability measures" which are *discontinuous*; hence they cannot qualify as 'probability measures' by virtue of [Gleason's theorem](#).

The so-called **John** stands for the *potential*, not-yet-physical, pre-quantum, unspeakable, and noncolorizable quantum-gravitational "it", which is always **separated** from its *physicalized* "jackets" due to the **dynamics** of the [Arrow of Space](#) (cf. also option YAIN (iii) [above](#)). There is no other way to proceed. If you wish to ignore **it** and drop *everything* on a dead fixed spacetime equipped with a [dead frozen](#) Cauchy hypersurface ([Robert Wald, p. 201](#)), you will only explore Feynman's '[blind alley](#)'.

NB: We must never [hide](#) these essential facts from our students. They are kids and have the right to know *everything* we know.

Recall *the* most widely known public secret in theoretical physics -- [localization](#). Everything else, Bell's argument included [[Ref. 2](#)], is based on the nature of quantum reality: "In general, a variable *has* no definite value before I measure it; then measuring it does *not* mean ascertaining the value that it *has*." ([Erwin Schrödinger](#)) Which means that the noncolorizable UNSpeakable pre-quantum "state" (called here '[John](#)') does **not** belong to the inanimate physical world, but only casts there its perfectly well localized "jackets" on the '[curved wall of the cave](#)' -- *the* most widely known public secret in theoretical physics, called [localization](#). Don't forget that a single quantum particle does possess full "[jackets](#)" -- *energy* and *momentum* at particular *location* and *instant* -- all of which match the **path** of macroscopic water droplets in [Wilson cloud chamber](#) (see discussion [above](#)). And secondly, **all** these "jackets" are entangled with/by John from [The Beginning](#).

In the context of Einstein's dictum 'God casts the die, not the dice' (English translation by Jean Untermyer), the "die" is the noncolorizable UNSpeakable pre-quantum "state" called '[John](#)', while its 'jackets' refer only to the **physical** presentations of 'the quantum world *out there* without observers'. Surely John's jackets can't live on [Minkowski spacetime](#); in the case of the human brain, check them [here](#). To avoid confusion, bear in mind that the [binding phenomenon](#) is *biological* presentation of entanglement due to 'the ultimate John' or '[the universe as ONE](#)', while at [galaxy length scale](#) we see [the same](#) entanglement inducing [gravity & rotation](#) on its "jackets". It's like a song played with three very different instruments -- biological, quantum, and gravitational; the basic assumption from 'the universe as a brain' is that *the psyche* can [penetrate matter](#) only at macroscopic length scale, thanks to which we have **life**, from [microorganisms](#) to humans. We will put aside for now the obvious question (prompted by Virgil's statement *Der Geist bewegt die Materie* and 'the ultimate John' [[John 1:1](#)] or the [Noumenon](#) of 'the ideal monad [without windows](#)') about whether 'the universe as a brain' may or may not have qualities resembling human mind and consciousness.

In general, the genuine [quantum state](#) in the quantum realm 'out there' is **not** what we can observe at macroscopic length scale -- [either "nose" or "arm"](#) (bzw. [particle or wave](#)). The quantum "jumps" would inevitably look *both* "instantaneous" and "[random](#)" to an observer who has imposed a classical "filter" through which 'the quantum world *out there*' can cast its jackets at the length scale of tables and chairs.

The genuine *ontic* noncolorizable UNSpeakable quantum "it" is **not** about [probabilities of something](#), because any such 'something' is already "colored": we can think about it, speak about it, and offer some probability for its observation. It is best described with the macroscopic "[jackets](#)" of spin: there is no small rigid body rotating about its axis, but "spin **minus its physical basis**" ([Hans Ohanian](#)). We do observe water droplets, as we know [since 1929](#), as well as the "[jackets](#)" of spin and [localization](#) of an electron', but never *the* genuine *ontic quantum state itself*.

Likewise, we observe [rotation](#) in astronomy, but people should stop speculating about some "dark" stuff, just as we don't speculate about some '[small rigid body](#) rotating about its axis'. If you look at the left-hand side of field equations ([Kevin Brown](#)), the **intangible** ([Hermann Bondi](#)) **pure energy** has the same ontological status of 'energy of *something* **minus its physical basis**', and if some people try to trace **it** back from its [linearized](#) "jackets", they will fail and would consider **it** "dark", like in the story with [Stavros](#).

Observe that 'probability' and 'energy' pertain to the local (physical) mode of spacetime, and must be treated like adjectives -- we have only 'probability of *something*' and 'energy of *something physical*', while the *intangible* ([Hermann Bondi](#)) **pure energy cannot** refer to *anything physical*. If it could, it will be *colorizable*, which means '**converted** into energy of *something physical*' or "timber" (see below).

Moreover, the **transition** between "the intangible energy of the gravitational field (as it will be called here), which is not described by the energy-momentum tensor, and the tangible forms which are so described" (Sir Hermann Bondi, Conservation and non-conservation in general relativity, *Proc. R. Soc. Lond. A* 427 (1990) 249-258) may be *bi-directional* -- matter could **dissolve** back to the vacuum and stay available there for any partial, full, or "over unity" recall, **if and when needed**. If you disagree, you have to embrace the weak cosmic censorship hypothesis, according to which spacetime singularities are produced in gravitational collapse of "physically reasonable" matter that evolves from "[smooth](#)" initial data (James Isenberg, [footnote 3](#)), and are hidden behind some "[event horizon](#)" that can [crack](#) and expose some naked time-like singularities which will, in turn, ruin the whole universe.

The phenomenon of '**pure energy**' is noncolorizable and UNSpeakable as well. Its **conversion** into physical stuff with [positive energy density](#) determines "the rate at which the nongravitational matter receives (*physicalized* - D.C.) energy and momentum from the gravitational field" ([Hans Ohanian](#)). Perhaps such **conversion** of "marble" into "timber" (see below) is [atemporal](#), and includes alteration of the quantum wave *phase* producing [constructive interference](#) in the [quantum vacuum](#). We should indeed consider it a *nonconservation* law (*ibid.*) of the *dynamics* of spacetime along the [w-axis](#).

In general, a gravitational "field" *per se* does not exist as physical reality but only as *potential reality* of noncolorizable and *intangible* '**pure energy**'. Its *physicalized* presentation ("timber", see below) is **not** 'objective reality at a point' but a fleeting *wegtransformierbar* faculty of gravity, which makes the story of Tom, Dick, and Harry to resemble the Landau-Lifshitz [pseudotensorial](#) recipe: in both cases, we get *some* physical stuff, but **not** the whole thing which keeps its Genidentität (Kurt Lewin) through time, so we can eliminate "by hand" what we have, and obtain "new" physical stuff.

In the context of the [school of fish metaphor](#), the *intangible* gravitational **pure energy** ("marble", see [below](#)) of 'the school as ONE' becomes *physicalized* (example from particle physics [here](#)) by fixing the **next** state of every [quasi-local](#) fish ("timber"), yet at the very same instant every quasi-local fish has **already** feedback-instructed (past tense) 'the school as ONE' about its *possible* **next** state.

$$\underbrace{R_{\mu\nu} - \frac{1}{2}g_{\mu\nu}R}_{\text{Marble}} = \underbrace{\kappa T_{\mu\nu}}_{\text{Timber?}}$$

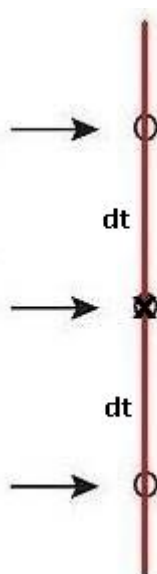
At every instant 'now', the end result from the nonlinear marble-timber negotiation is *already*-correlated in timber's **past**. Hence a [proton](#) can exist *only* as [self-acting](#) timber (just like the [human brain](#)), and the [Higgs](#) are not physical but "dark", just like the "dark" [basis of spin](#). Likewise, if we look at the [brain](#) we can't detect its mind but only the **past** states of a [self-acting](#) brain. Simple, no?

$$R_{ij} - \frac{1}{2}g_{ij}R = \frac{8\pi G}{c^4}T_{ij}$$

«Space acts on matter, telling it how to move. In turn, matter reacts back on space, telling it how to curve.»

C.W. Misner, K.S. Thorne, J.A. Wheeler – *Gravitation*, Freeman & Co., 1973 (p.5).

Consider a horizontal step from a ladder, and picture it as an instant 'now' (marked with **x** ; see the drawing below) from the [Arrow of Space](#), at which the **nonlinear** negotiation (recall Escher's [drawing hands](#)) between the *intangible* "marble" and the tangible "timber" has *always* been **already** completed *at the very instant* we look at it (Leibnizian [pre-established harmony](#)).



A "horizontal" instant 'now' (marked with **x**) from the *flow of time* in the [Arrow of Space](#), defined with respect to the fleeting 'potential future' (*not yet* marked with **x**) and 'irreversible past' (already *not* marked with **x**). The **red** vertical ladder shows the global mode of spacetime, which does not *physically* exist. The **re**-creation of physical universes at the instant 'now' produces the flow of time and *requires* energy [nonconservation](#) and "[dark](#)" [effects](#) along the vertical axis (Phoenix Universe), while matter and energy are conserved one-at-a-time in their horizontal physical universe. The gaps **dt** are made **zero** by [the "speed" of light](#), which produces a *perfect* continuum of the *accumulated-in-time* dimensions of spacetime.

The arrows symbolize some kind of "[torch](#)" which highlights different points from space, but because this torch would have to "move" to different points, physicists claim that such torch does not exist, and our perception of the flow of time is an illusion, or at best an effect of [thermodynamics](#). They also claim that the flow of time does not and [must not](#) *physically* exist, which is correct: physically, the "vertical" gaps **dt** are truly **zero**, thanks to which "the entire manifold is constructed by smoothly sewing together (notice the poetry - D.C.) these local regions" (cf. [above](#), p. 31).

Notice that the *potential future* (not yet marked with the instant \mathbf{x}) is made of *not yet* quantum-gravitational "**it(s)**", which resemble a "dough" or rather continual *density* of *intangible pure energy*. There is no metric there, no spatial relations (inside vs. outside, left vs. right), and no *set theory* relations, such as 'one vs. many' either. **It** (not He) is the ultimate presentation of *entanglement* (Verschränkung): "*the characteristic trait of quantum mechanics*" ([Erwin Schrödinger](#)). We can only sense the UNSpeakable **it** with our brains [here](#).

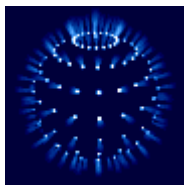
At the *instantaneous* step 'now' marked with \mathbf{x} above, we have an *already*-negotiated energy conservation that is indistinguishable from [Minkowski spacetime](#), so people can literally *insert* at this point \mathbf{x} the Hamiltonian formulation based on the notion of [hyperbolicity](#) backed with some sloppy speculations from [thermodynamics](#). Namely, "the coordinates are **asymptotically** those of a flat spacetime with inertial rectangular coordinates" ([H. Ohanian](#), private communication), gravity has become at *this* instant "[linearized](#)", and the two negotiating parties in [EFE](#) should have **anceled** each other (not exactly, due to the "[dark](#)" energy), or else "the [ether](#) would come back!" ([M. Montesinos](#)).

Also, the *instantaneous* step 'now' marked with \mathbf{x} above is the *instant* at which the '[GR elevator](#)' has been **suddenly** "pushed up" -- once-at-a-time -- and the whole universe has been **re**-created with positive mass, inertia, and a [dead frozen](#) Cauchy hypersurface, thanks to which at this instant of time "throughout the universe" ([Robert Wald](#), p. 201) we can indeed postulate [tangent vectors](#) -- again, once-at-a-time only.

Last but not least, at this point \mathbf{x} we have null vectors and null surfaces that are everywhere orthogonal to a null vector -- the "remnant" from the [Arrow of Space](#), which has been effectively **nullified** at the instant \mathbf{x} and the whole local (physical) mode of spacetime.

Then the **next** step 'now', at $t_0 + dt$, will **re**-create (Phoenix Universe) the whole universe anew from t_0 , but with different *content* at dt , which will be **re**-negotiated along the [atemporal](#) "vertical" [Arrow of Space](#), namely, in the [dark Zen gaps](#) dt of the global mode of spacetime.

Again, these **gaps** of *intangible pure energy* are **nonexistent** in the local (physical) mode of spacetime thanks to [the "speed" of light](#), and we can see *only* a *perfectly smooth* continuum of **already** completed and already **re**-negotiated 'world points' ([Bergmann and Komar](#)). The 'world points' **cannot** hold the [gravitational energy density](#) at a geometrical point (e.g., like electromagnetic energy on flat spacetime), because such classical 'world points' will **expose** the *flow* of *physicalized* energy coming from '[the universe as ONE](#)' in the "timber", and the flow will be [recorded with a physical clock](#), as in the example with the [Sun](#). Then the whole theory of relativity will be ruined, because we would have direct observational proof of such [absolute object](#).



Don't try to recover the genuine nonlinear dynamics of spacetime, exhibited in its "[waves](#)", from only *one* "horizontal step from a ladder", like in [Dirac-ADM](#) hypothesis. There is absolutely nothing resembling law and order in the "[spacetime foam](#)" to [raise](#) a robust [Lorentzian metric](#) within 10^{-30} seconds "after" the "[big bang](#)" and the increase of universe's "size" (with respect to

what?) by a [factor of \$10^{78}\$](#) , and keep the Lorentzian metric for at least [13.73](#) billion years rooted on the Planck length at which "points become *fuzzy* and *locality loses any precise meaning*" ([Sergio Doplicher](#)). We need perfect points at *all length scales*, made with the [atemporal](#) noncolorizable [dark Zen gaps](#) of the global mode of spacetime and the universe as [ONE](#).

Try a simple experiment [here](#). All you need is a brain. If your *brain* can do it, the universe should be able to do it as well; perhaps even better.

D. Chakalov
 March 7, 2013
 Last updated: April 13, 2013, 12:00 GMT

[Ref. 1] J. Bub, Quantum Correlations and the Measurement Problem, [arXiv:1210.6371v3](#) [[quant-ph](#)].

2 Correlations

Consider the simple case of measurements of two binary-valued observables, $x \in \{0, 1\}$ with outcomes $a \in \{0, 1\}$, performed by Alice in a region A, and $y \in \{0, 1\}$ with outcomes $b \in \{0, 1\}$, performed by Bob in a separated region B. Correlations are expressed by a correlation array of joint probabilities as in Table 1. The probability $p(00|00)$ is to be read as $p(a = 0, b = 0|x = 0, y = 0)$, i.e., as a joint conditional probability, and the probability $p(01|10)$ is to be read as $p(a = 0, b = 1|x = 1, y = 0)$, etc. (I drop the commas for ease of reading; the first two slots in $p(---|---)$ before the conditionalization sign $|$ represent the two possible measurement outcomes for Alice and Bob, respectively, and the second two slots after the conditionalization sign represent the two possible observables that Alice and Bob choose to measure, respectively.)

There are four probability constraints: the sum of the probabilities in each square

x	0	1
0	$p(00 00)$ $p(10 00)$ $p(01 00)$ $p(11 00)$	$p(00 10)$ $p(10 10)$ $p(01 10)$ $p(11 10)$
1	$p(00 01)$ $p(10 01)$ $p(01 01)$ $p(11 01)$	$p(00 11)$ $p(10 11)$ $p(01 11)$ $p(11 11)$

Table 1: Correlation array

cell of the array in Table 1 is 1, since the sum is over all possible outcomes, given the two observables that are measured.

[Ref. 2] Nicolas Brunner *et al.*, Bell nonlocality, [arXiv:1303.2849v1](https://arxiv.org/abs/1303.2849v1) [quant-ph].

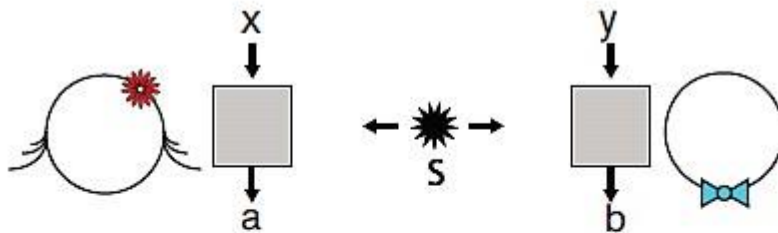


FIG. 1 Sketch of a Bell experiment. A source (S) distributes two physical systems to distant observers, Alice and Bob. Upon receiving their systems, each observer performs a measurement on it. The measurement chosen by Alice is labeled x and its outcome a . Similarly, Bob chooses measurement y and gets outcome b . The experiment is characterized by the joint probability distribution $p(ab|xy)$ of obtaining outcomes a and b when Alice and Bob choose measurements x and y .

When such an experiment is actually performed – say, by generating pairs of spin-1/2 particles and measuring the spin of each particle in different directions – it will in general be found that

$$p(ab|xy) \neq p(a|x)p(b|y), \quad (1)$$

implying that the outcomes on both sides are **not** statistically independent from each other. Even though the two systems may be separated by a large distance – and may even be space-like separated – the existence of such correlations is nothing mysterious. In particular, it does **not** necessarily imply some kind of direct influence of one system on the other, for these correlations may simply reveal some **dependence** relation between the two systems which was established when they interacted in the **past**.

Comment: The nonexistence of two-valued probability measures is **not** a formalization of the concept of [contextuality](#) viz. rejection of macroscopic realism (Erwin Schrödinger, [1935](#)): we have context-dependant "[states](#)" also in Bell's argument [[Ref. 1](#)], which complies with orthogonality constraints.

In our case, the noncolorizable UNSpeakable *pre-quantum* Kochen-Specker states correspond to the **full** catalogue of expectation values, which include non-commutative observables that **cannot** be [simultaneously measurable](#). Without such noncolorizable quantum "[states](#)", one would be able to "produce" with Gedankenexperiment a **full** catalogue of expectation values by

considering only one set of non-commuting observables, and would speculate further that such "wave function" might offer a "full description" of the quantum particle, provided we apply "counterfactual definiteness". But we can't, because the latter is applicable only and exclusively only to 'objective reality *out there*' from classical physics: if I toss a coin on the table and see heads, I can infer with certainty that the invisible state of the same coin was tails 'out there'. But this kind of classical reasoning is **not** applicable to Bell's argument [[Ref. 1](#)]: a quantum phenomenon is **not** a phenomenon unless it is an observed/registered phenomenon, **after** which we have 'quantum phenomenon' (try as an exercise the [Schrödinger cat](#)).

Surely we cannot measure all non-commutative observables at *one* instant, as recorded with our clock, but this constraint does **not** imply that a quantum particle 'out there' must conform to the nature of time relevant to *inanimate* macroscopic measuring devices, hence could *not* possess its noncolorizable UNSpeakable *pre-quantum* [ontic state](#). In the first place, we don't have time operators in QM and never will, and must never forget that the quantum realm 'out there' is **not** what we can observe at macroscopic length scale -- [either "nose" or "arm"](#) (bzw. [particle or wave](#)).

Again, the fact of the matter is that one cannot fit the noncolorizable UNSpeakable *pre-quantum* state "**it**" (never in plural) in any Hilbert space whatsoever. The "two" parties in Bell's argument, Alice and Bob, **is** (never in plural) a joint presentation of the noncolorizable *pre-quantum* quantum state "which was established when they interacted in the **past**" [[Ref. 2](#)].

It (not He) is not some additional object (like a bridge connecting two riversides), but 'the universe as [ONE](#)' manifested as 'the characteristic trait of quantum mechanics' ([Erwin Schrödinger](#)). The whole physical world (local mode of spacetime) is rooted on **it** and emanates from **it**. Nothing acts *between* Alice and Bob [[Ref. 2](#)] -- the so-called "ghost fields" (Gespensterfelder) or "spooky action at a distance" that would propagate "at least 10^7 times faster than the speed of light" (Nicolas Gisin *et al.*, [2002](#)) do not exist, just as there is no "action" *between* the brain and its mind ([Wolfgang Pauli](#)). They are **pre**-correlated "jackets" emanating from their common quantum-gravitational "**it**" which Albert Einstein envisaged as '[a total field of as yet unknown structure](#).'

It produces two mirror forms of entanglement, quantum and [gravitational](#), starting from the macro-world in two opposite "directions" along the **w-axis**. In the astrophysical form of entanglement, we encounter the tug-of-war manifestation of gravity between "[dark matter](#)" and "dark energy", along with the ubiquitous [rotation](#) -- just as in the case of "[spin](#)". Yet the majority of people would prefer "supermassive [black holes](#)" inhabited by [advanced Russian civilizations](#), instead of quantum gravity.

As of [today](#), nobody cares about the unfinished theory of [Albert Einstein](#). [Nobody](#).

D. Chakalov
 March 8, 2013
 Last updated: April 12, 2013, [17:32:39 GMT](#)

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Available online at
<http://www.god-does-not-play-dice.net/#ETH>