

20th Century Physics—A Eulogy

Vesselin C. Noninski

New York Sofia Institute, 149 West 12th Street, New York, NY 10011

This text explores the need for reform in physics which arises from the shown analysis of some examples of studies which, although seemingly of only historic importance, in fact form the backbone of modern physics. Although the technical arguments given are conclusive, some initial thoughts are presented regarding their social impact.

Introduction

The social damage of persistent imposition of problematic science as genius science far exceeds the harm which such imposition incurs on natural science itself. This effect is much obscured due to the usual substitution, by modern society, of technology for science. All looks well on the surface, given the technological revolutions which have occurred during the past several decades, let alone that fundamentals are rarely traced back to their origins. If any discrepancy is detected there, it is relegated only to the history of science, as a matter closed to technical discussion. Deep in society, however, invisible processes take place, subtly shaped by the curved world view of the toxic science, with results not as spectacular but quite the opposite, suddenly erupting as political crises, seemingly out of nowhere.

The connection between pathological science and the health of society at large may seem hard to explain, least of all easy to prove, but that connection may start becoming slightly more evident when one realizes that social sciences can embrace the postmodernist view, such as, for example, that “truth is only an invention” as some academics now believe, only if none other but the natural sciences have provided them with grounds to so adopt. For, how otherwise could truth be only an invention, if hard sciences were maintaining otherwise; that is, if hard sciences were holding firmly onto their essential beginnings, never allowing for even a trace of doubt in, at least, certain firm knowledge, which is not an invention, such as postulates, definitions and basic logic?

One can hardly imagine healthy functioning hard science, based strictly on reason, on logic and the scientific method, co-existing with con-

fused social sciences, influencing the society at large. If such a state existed, then there would always have been stopping scientific mechanisms of logic and reason, which would come forth and sanitize mainstream society from insanity. Enclaves of insanity are inevitable in any free society but insanity overtaking the mainstream is dangerous and self-destructive.

The disconcerting fact is that the swelling postmodernist approach, a flawed approach if indeed it is rooted in the falsity of the current fundamentals of modern physics, is already overflowing outside of academia and is steadily becoming the mainstream politics, implemented in legislation and international conventions. Therefore, considering the need for prompt correction, there is some urgency in clarifying what deformities of the fundamentals the sciences may contain, and if and how these deformities are affecting social thought, respectively, society at large.

It has become usual for people in the soft sciences, who like to be thought of as philosophers and genuine scientists, to sprinkle their writings with 20th century lingo, perceived as highly scientific and academic, in order to appear more learned, regardless of the fact that they have no idea what this lingo actually means. They have been mocked¹ for that intellectual snobbery, although it should become clear from the text below who is really to feel the mockery on his back. It is clear that persons such as Karl Popper² rely on others, socialized as scientists, to have done their homework when using the conclusions in that homework for advancing their own questionable theses, in the same way you and I rely on engineers and constructors to have properly built the bridge we are about to cross, thus maintaining our faith that the bridge will not fall.

On the other hand, a physicist, such as Alan Sokal¹, cannot enjoy such an excuse. It is his job to know better when it comes to the fundamentals of physics, but, as it concerns the fundamentals of 20th century physics, it does not appear that he has devoted much thought to them but is ready to criticize others regarding matters he himself has not understood well.

Of course, when a doctrine has ubiquitously encompassed the world of science and society, it seems unfathomable that it could be false since so many people subscribe to it. This had been the case with Nazi ideology and with Communism, and this is how it is with the postmodernism today. Moreover, Communist ideology has purported to be the ultimate scientific doctrine that ever existed. This brings us back to the question at hand. How is Communism the most scientific since it has been most tolerant and acceptive toward a doctrine governing physics during the entire 20th century, until today, which can be seen and proven immediately to be outright wrong, as shown below. Fascism during its time and postmodernism today have been equally as receptive of that hitherto unseen demonstrable pseudoscience. At least, if that is a consolation, the latter did not claim a scientific absolute, as Communism did. All these 20th century ideologies coalesce in the solidarity of the unquestionable acceptance of the pretense that the illogical is science. Thus, without resolving this common root of evil, any social doctrine will ultimately be futile and will share responsibility for not only not being able to cure the ills of society, but, in actuality, aggravating them.

Inspection of the fundamentals of physics, carried out below, reveals a truly unacceptable state of affairs. Unbelievable as it may sound, a major part of contemporary physics is indelibly connected with one single mathematical construct, known as the Lorentz transformations, which, although mathematically consistent, has no physical meaning. Remove the non-physical Lorentz transformations, and nothing comprising the gist of what today's theoretical physics prides itself in, will remain. There will be no cosmology, no string theories, no theoretical foundations for

particle physics or high energy physics, no Higgs bosons, no gravitational waves and whatnot. All these ideas and claims must be abandoned as not rooted in reality.

It is even more noteworthy that, aside from showing that Lorentz transformations are non-physical by analyzing them directly, their physical inconsistency and clash with basic logic is efficiently demonstrated by the senselessness of nothing other than Einstein's relativity, which these very transformations render internally contradictory, violating its own first postulate. This fact regarding Einstein's relativity makes it not even controversial in the sense that climate change, homeopathy and postmodernism are. Directly discernible inadequacy in the pages in a scientific text, as the ones shown below, are unequivocal proof, not controversy. The "in your face" facts shown prove that we are not dealing here with a conspiracy theory. The real "fake news" is any announcement that there have been experimental confirmations of Einstein's relativity or of anything else related to the Lorentz transformations. The really controversial, if not scandalous, state of affairs regarding Einstein's relativity, is the mere tolerance in mainstream science of such immediately provable incorrect physics. Furthermore, politicians use as a political tool for election the spending of tax dollars on education as an abstract term, but never bother to analyze what is really being taught at schools and universities. It could be, in addition to malfunctioning academia, that this intellectual complacency and laxity, allowing senselessness to penetrate curricula, is another reason why such an obviously flawed undertaking has so efficiently ambushed big science and society.

Paradoxically, Einstein's relativity, the theory which invalidates itself, provides a unique opportunity, which science has never entertained before, to have a doctrine, promoted to such significance, be unequivocally discernible as incorrect by even people of average scientific comprehension, even with limited science background.

Indeed, it is up to really anyone of even limited experience in science to see at once that the second and the fourth set of equations in §10 of

the founding paper³ referred to the one (k) and the other (K) of the two coordinate systems in uniform translatory motion are affected after the application of the Lorentz transformations shown as equation set 3—equation set 4 referred to K contains velocity v explicitly and implicitly (through the coefficient $\beta = \frac{1}{\sqrt{1-\frac{v^2}{c^2}}}$), while equation set 2

referred to k does not contain velocity v (cf. Fig.1 here)¹³. Hence, as a result of applying the Lorentz transformations the physical law is affected when referred to the one (k) or the other (K) of the two coordinate systems in uniform translatory motion.

From the above assumption, in combination with the principle of relativity, it is clear that in the immediately ensuing time (for small values of t) the electron, viewed from the system k , moves in accordance with the equations

$$\textcircled{2} \quad \begin{aligned} m \frac{d^2 \xi}{d\tau^2} &= \epsilon X', \\ m \frac{d^2 \eta}{d\tau^2} &= \epsilon Y', \\ m \frac{d^2 \zeta}{d\tau^2} &= \epsilon Z', \end{aligned} \quad \begin{array}{l} \text{no } v \text{ present} \\ k \end{array}$$

in which the symbols $\xi, \eta, \zeta, X', Y', Z'$ refer to the system k . If, further, we decide that when $t=x=y=z=0$ then $\tau = \xi = \eta = \zeta = 0$, the transformation equations of §§ 3 and 6 hold good, so that we have

$$\textcircled{3} \quad \begin{aligned} \xi &= \beta(x - vt), \eta = y, \zeta = z, \tau = \beta(t - vx/c^2), \\ X' &= X, Y' = \beta(Y - vN/c), Z' = \beta(Z + vM/c). \end{aligned}$$

With the help of these equations we transform the above equations of motion from system k to system K, and obtain

$$\textcircled{4} \quad \left. \begin{aligned} \frac{d^2 x}{dt^2} &= \frac{\epsilon}{m\beta^3} X \\ \frac{d^2 y}{dt^2} &= \frac{\epsilon}{m\beta} \left(Y - \frac{v}{c} N \right) \\ \frac{d^2 z}{dt^2} &= \frac{\epsilon}{m\beta} \left(Z + \frac{v}{c} M \right) \end{aligned} \right\} \begin{array}{l} v \text{ present} \\ K \quad \dots \quad (A) \end{array}$$

violation of the first postulate

Fig. 1

Part of §10 in ref.³ directly showing the violation of the first postulate a.k.a. the principle of relativity due to the application of Lorentz transformations (eq. set 3)—the physical law referred to the two systems k and K in uniform translatory motion is affected—eq. set 4 contains velocity v , while eq. set 2 does not contain velocity v .

This affecting of equation sets (systems of equations) 2 and 4 is in direct contradiction to the first postulate of the theory stated in §2 of ref.³:

1. The laws by which the states of physical systems undergo change are not affected, whether these changes of state be referred to the one or the other of two systems of co-ordinates in uniform translatory motion.

Nothing more needs to be said regarding anything at all about the unsuitability of the Lorentz transformations and their progeny for physics, as well as about Einstein's relativity, the only role of which is to provide one more convincing proof that these Lorentz transformations are useless for physics. A theory such as Einstein's relativity, based on such a fatal internal contradiction, as the one shown, deserves nothing other than full rejection. Needless to say, such a theory can never meet with experimental confirmation and any claim for such is clearly impossible.

Such a categorical argument, as the one shown above, unequivocal and yet easy to see in the very pages of ref.³, has been missing throughout the decades, over a century now, and that has allowed for the wide spreading of this non-science, fueling barren hopes for some new unheard of world of knowledge. The has stimulated the imagination of ever increasing number of muddled dreamers, spawning fantastic unbelievable visions of worlds that can never be. This is considered enjoyable by some, but alas is hallucinatory and untrue, as far as the physical world is concerned. It has grasped adherents so strongly, as would some kind of fanatic religion or heroin, with an addiction and protective passion unmatched in history.

The passionate advocacy and defense has created a new culture in academia, which goes well beyond only the material opportunism of protecting salaries and grants. This is turned into a way of life and pride, a token of belonging to some higher, elite sect of special intellect.

In this case, however, fanaticism is further justified by calling it science, clothing it

in pseudo-intellectualism and quasi-learnedness, which, unlike the typical maverick sect, legitimizes it in the eyes of society all the more, as something ubiquitously mainstream and proper. Adherents, more and more steadily occupying academia, bask in this bliss. To expect that they will heed scientific argument and abandon their world of hallucinations, no matter how devastating to their unfounded belief, is a sign of naiveté.

One tends to stop short at this point, as far as further implications, especially social implications, of this pathological science go, because this is up to this point where the devastation can be quantified and unconditionally proved and rejected. The problems in the fundamentals are directly provable, as seen, the spread in science of the disaster can be determined precisely by observing where the Lorentz transformations are involved, the material damage to society can also be exactly estimated by the amount of public funding for projects based on the Lorentz transformations. There is countable evidence of propaganda from the mainstream media.

What is more subtle to prove categorically is the social impact of that flawed science, its role in the formation of twisted ideologies and doctrines, the visible part of which is the harmful indoctrination of even one who would become the President of the United States, believing and governing under the influence of his mentor Laurence Tribe⁴ understanding, that "constitutional space" can be curved just as physical space is curved as 20th century physics in the face of Einstein's relativity falsely proclaims. We just saw that Einstein's relativity can prove nothing of the kind because anything connected with it contradicts not only the physical world, but logic itself, let alone the infeasible suggestion that findings in physics can be transferred mechanically into the social sphere.

To sustain this, the senselessness-loving clique needs a strong lobby, because someone has to pay for these exercises in futility. Proponents have developed a whole arsenal of protective mechanisms ranging from personal assaults and accusations of incompetence to creating the atmosphere that criticizing it is an expression of bad taste.

Obviously, the fact that the floodgate of peer-review has been wide open for the discussed toxic science and has allowed the onslaught of insanity in such proportions to flood science, shows that the peer-review process, so much acclaimed by some, is broken. The known system of peer-review should be repaired and improved. As a first step, peer-review should be required only for aspiring scientists in their formative years as researchers. An accomplished scientist with tens of peer-reviewed publications, especially as a sole author, should be exempt from further peer-review, his or her reputation serving as a guarantee of scientific quality. It is inconceivable how sometimes junior editors can prevent quality research from being published, to say nothing of pandering to the party line, as the engine to decide what is to be published and what is not. This is only scratching the surface of the problem. The real reason why science has brought itself so low should be the subject of a special deeper study.

Physics professionals have come to the point where the only argument which will attract their attention is when their funding is at stake. As already mentioned, other arguments, even of sound scientific nature, are ignored by them outright. Thus, another method to correct this deepening chronic problem of physics abandoning reason is to apply questioning under oath in a quasi-judicial procedure, especially when it comes to funding of the mega projects based on the Lorentz transformations. Since current academia really begins to listen when funding is at stake, the quasi-judicial additional layer of accountability¹⁴ becomes the best method of filtering the pseudo-science from public funding. To be really efficient, the scientific argument should be formulated in such a way that even a person, such as a Congressman or a Senator with basic knowledge of science should be able to personally understand it. To form such an unequivocal and yet comprehensive argument is a rare occurrence. Fortunately, such a circumstance has been found and, as mentioned, the argument proposed above has

such qualities. By applying this quasi-judicial approach, the most efficient science policy known to this author, the manipulators tolerating senselessness for their own advantage, would know that there will be consequences when they twist every word or claim¹⁵.

Finally, I should mention this again—the correction of the obvious easily detectable problem, having not only closely scientific but also affecting the wider social milieu, can be achieved only by involving outside help, by engaging responsible parties outside of academia, who can understand personally this easy to comprehend fatal error and stop its public funding. Therefore, to require that first consensus should be reached in the professional circles, and then look for understanding by the wider society, is to help this problem to further persist.

Although of lesser impact than Einstein's relativity, analysis of papers demonstrating similar disregard of reason, logic and the principles of the scientific method are shown in the ADDENDUM. The analysis in in the ADDENDUM indicates that we are dealing with a broader problem of intellectual poverty than just the above-discussed one concrete false theory imposed on the world at the beginning the last century. The poor and muddled way of thinking is detected in all the *Annus mirabilis* papers.

This adds more strokes to the portrait we are trying to create of the connection between the flaws that have ambushed physics and the advent of postmodernism, especially in its truth-denouncing postulates, giving rise to a colorful voluntaristic mix, which requires a special kind of ill talent. As already said, there is a lot more to be clarified about this connection between the world of science and the world outside of it. This text gives as much as it can as a firm basis on the scientific side. What the actual parameters are of this affecting the social sciences is a matter of further research for which the text at hand only gives a hint.

ADDENDUM

Another observation supporting the conclusion that we are dealing with a systematic problem

In support of the conclusion that the crucial flaw in paper³ is not some happenstance error but is an expression of a systematic way of erroneous thinking, can be made when looking at ref.⁵. The deceptive substitution, detected in ref.⁵, of an expression for a coefficient $p_n = p_m \frac{B_m^n}{B_n^m}$, obtained from an equality only valid at high temperature, namely

$$p_n B_n^m = p_m B_m^n, \tag{1}$$

mistakenly replacing it in the equation valid for low temperature

$$p_n e^{-\frac{\epsilon_n}{kT}} B_n^m \rho = p_m e^{-\frac{\epsilon_m}{kT}} (B_m^n \rho + A_m^n), \tag{2}$$

is an error of the same type as that in ref.³ From ref.³ the incredible conclusion is inevitable that one and the same body in one and the same system can obey two different laws of motion at the same time, while in ref.⁵, this same unbelievable kind of thinking results in two different equilibria being valid at the same time and at the same temperature for one and the same system.

This kind of twisted thinking has been systematically implemented in society for over a century as some kind of novel, innovative thinking and that has further shaped the intellectual milieu in other disciplines at universities, thus taking the rest of society on a really destructive path, trying to convince society that imagination (which really is gross error in science) is more important than knowledge.

Paper on Specific Heat⁶—Planck’s radiation law again not derived

Planck’s radiation law has not been derived in another paper, the paper claiming to explain the anomalous specific heat of solids⁶, wrongly portrayed as a great scientific achievement—the incorrect second equality, under the specified conditions, in the second chain of equalities on page

183 of ref.⁶

$$\frac{\int E e^{-\frac{N}{RT}E} \omega(E) dE}{\int e^{-\frac{N}{RT}E} \omega(E) dE} = \frac{0 + A\epsilon e^{-\frac{N}{RT}\epsilon} + A.2\epsilon e^{-\frac{N}{RT}2\epsilon} \dots}{A + A e^{-\frac{N}{RT}\epsilon} + A e^{-\frac{N}{RT}2\epsilon} + \dots} \tag{3}$$

defeats the claim that Planck’s radiation law $\frac{R}{N} \beta v$ has been derived in ref.⁶

Furthermore, the attempt to connect the alleged correction of the specific heat law of Dulong and Petit $c_v = 3R$ for anomalous specific heat, using the known Planck law has also failed.

To achieve similarity with the Dulong and Petit law. Einstein has remodeled Planck’s radiation law to have the ideal gas constant R appear as part of Planck’s expression for the average energy $\bar{\epsilon}$. Planck’s expression for $\bar{\epsilon}$ is not at all only valid for 1 degree of freedom, as the author of ref.⁶ assumes, and thus proceeds to multiply it by 3 to resemble the Dulong and Petit law. Neglecting even the fact that, should degrees of freedom be considered at all, a harmonic oscillator has 2, not 3 degrees of freedom. Had he plotted this “corrected” Dulong and Petit law, he would have seen that the form of the graph and the values of c_v , have nothing to do with what is known from experiment.

Instead, the author proceeds with taking the first derivative of the mentioned 3 times $\bar{\epsilon}$, with respect to T , and claims that the result is plotted on page 186 of ref.⁶ as a function of $\frac{T}{\beta v} = \frac{kT}{h\nu}$. However, it is not. The figure on page 186 of ref.⁶ shows experimental (the dots) and calculated (the dashed line) heat capacity c_v as a function of temperature T , both curves referring to one concrete value of $\lambda = 1.1^{-5}m$, assessed by using the experimental value of $c_v = 1.828$ corresponding to $T = 331.3$ from the table on page 190 of ref.⁶ For the experimental data plotted in the figure on page 186 of ref.⁶, taken also from the table containing the respective data for diamond on page 190 of ref.⁶, a scaling coefficient $\frac{\lambda k}{hc} = 0.00076$ is used to simplify the x -axis span of the temperature from 0 to 1 (this does not make λ the independent variable on the x -axis, as implied by the

author). For the same reason the third equation from the top (equation (8)) on page 186 of ref.⁶ is reduced to 5.94. $\frac{(\frac{1}{T})^2 e^{\frac{1}{T}}}{(e^{\frac{1}{T}} - 1)^2}$ and is plotted as the dashed curve therein.

The theory proposed that specific heat of solids has anything to do with the Planck resonators, however, fails because experimental data (the dots), being of 3 times greater value, do not fall on the calculated dashed curve. Even the *petitio principii* using the same experimental data on page 190 to calculate λ from his theoretical formula 5.94. $\frac{(\frac{h\nu}{kT})^2 e^{\frac{h\nu}{kT}}}{(e^{\frac{h\nu}{kT}} - 1)^2}$ seen on page 186 to compare

it back with the same experimental data on page 190, does not help either. In addition, it is hardly conceivable that the specific heat of a given solid would be associated with resonators having the same frequency (wavelength) for all the temperatures studied, especially at such a wide range as that in the study. The fact that everything that is presented in the figure on page 186 of ref.⁶ is for one single wavelength λ , makes all the discussion involving λ regarding that figure, as well as anything else on pages 187 through 190 involving λ effects, without basis. Structure of solids may certainly affect specific heat and cause anomalies but that has nothing to do with the attempted conjecture that anomalous specific heat of solids is associated with quantum effects stemming from Planck's radiation law.

Therefore, none of the claims in ref.⁶ are sustained. It should also be mentioned that, although, as seen, Einstein's relativity must be removed from science without a trace, a legitimate theory of the anomalies in the specific heat of solids may be sought in terms of proposed classical explanation of how energy is transferred amongst harmonic oscillators, proposed by C. I. Noninski⁷.

*The paper on Brownian Motion*⁸

Einstein's Brownian motion paper⁸ fails to prove a connection between the behavior of particles suspended in liquid and the behavior of an ideal gas or ideal solution first by failing to derive the os-

motiv pressure equation from the expression of entropy S . Thus, to derive the known osmotic pressure equation, Einstein uses the following expression for entropy

$$S = k \ln W = k \ln \int_{-\infty}^{\infty} C e^{-\frac{E}{kT}} dp_1 \dots dp_\ell = k \ln 1 = 0. \quad (4)$$

by considering that the coefficient C in what he considers an entropy expression; namely, $\int_{-\infty}^{\infty} C e^{-\frac{E}{kT}} dp_1 \dots dp_\ell$ is $e^{\frac{3}{2}T}$ and can be factored out of the integral, leading to eq.(4). However, that expression for entropy is 1 to begin with, therefore Boltzmann's expression $S = k \ln W$ yields nothing else but 0. This makes the connection with osmotic pressure unfounded because the expression for pressure p (the expression at the end of §2, p.558 of ref.⁸) is not derived.

More importantly, §3 fails to derive an expression for the diffusion coefficient D based on thermodynamics because the second and third expressions in §3 give

$$-K \delta x = kT \frac{\partial \delta x}{\partial x}, \quad (5)$$

from the first equation $\delta F = \delta E - T \delta S = 0$. However, eq.(5) cannot be a true equality, showing a negative quantity equal to a positive quantity, let alone that it is meant to apply to particles independent of each other with no quantum effects, for which the partition theorem requires $\frac{3}{2}kT$, to say nothing of the fact that this average energy $\frac{3}{2}kT$ has no x -dependence through an x -dependent coefficient which one sees in eq.(5). The inability to derive D in thermodynamic terms makes all further efforts in ref.⁸, as trivial as they are, to connect any of the standard solutions of the diffusion equation (Fick's second law) with the thermodynamics of an ensemble consisting of individual particles, in vain. Thus, it cannot be considered that this particular paper, ref.⁸, provides any reasoning in support of the atomistic nature of matter.

*The paper on Photoelectric Effect*⁹

The heuristic paper on photoelectric effect⁹ cannot sustain the claim for quanta being the carriers of light. To prove the view that a set of resonators behave as the particles of an ideal gas, Einstein uses the known expression $S - S_0 = R \ln \frac{v}{v_0}$ for the entropy difference valid for an ideal gas with the intention to show that exactly the same entropy difference holds for radiation contained in volume v . Such an analogy would be the proof, Einstein conjectures, that the behavior of these two seemingly different systems, an ideal gas and radiating resonators, is the same, hence radiation behaves as a system of individual particles and is not continuous. To show this, he uses an expression for the entropy of the radiation enclosed in volume v

$$S = v\varphi(\rho, v)dv = -\frac{E}{\beta v} \left\{ \ln \frac{E}{v\alpha v^3 dv} - 1 \right\}. \quad (6)$$

However, he fails to consider the fact that when volume v is changed to v_0 , frequency ν also changes to ν_0 . The dependence of frequency ν of a standing wave on the dimensions of the enclosure are well known from wave theory: $\nu = \frac{c}{2Ln}$, which leads to E_0 different from E and to the new expression for entropy

$$S_0 = v_0\varphi(\rho, v)dv = -\frac{E_0}{\beta v_0} \left\{ \ln \frac{E_0}{v_0\alpha v_0^3 dv} - 1 \right\}, \quad (7)$$

corresponding to the new volume. This will lead to a more complicated expression than $S - S_0 = R \ln \frac{v}{v_0}$ when subtracted from expression for S in eq.(6). Thus, the intention to demonstrate similarity between radiation and an ideal gas, thus giving a basis for a view that light consists of quanta, is not achieved. This failure determines also the failure to derive

$$W = \left(\frac{v}{v_0} \right)^{\frac{N}{R} \frac{E}{\beta v}}. \quad (8)$$

as the proof that probability in Boltzmann's law in the case of light has thermodynamic origin and consists of mutually independent energy quanta.

This problem has been pointed out by Nauenberg in ref.¹⁰. However, the author of ref.¹⁰

considers it to be only a gap in the theory. As shown here, however, this is a crucial problem regarding scientific justification of the view for the quantum character of radiation, a crucial problem laid out in the theory as early as §4 of the paper.

Having seen that all paragraphs, §1 through §7, have failed to justify the conjecture that light has anything to do with particles, §8 stands on its own, applying this unjustified claim in the case of the photoelectric effect.

The above-seen failure to justify theoretically the quantum character of light makes the relations given in §8 only a rehash of relations already known from the earlier experimental works of Stoletov¹¹ and Lenard¹² (cf. Fig.2 on p. 162 of ref.¹²).

It should be noted, however, that there is nothing unusual in the view that energy is transferred and exchanged in portions, including in the case of the photoelectric effect. On the contrary, this view is contained most naturally in classical mechanics and physics. This intuitively qualitatively clear fact has been shown quantitatively by C. I. Noninski in his paper⁷, which will be the subject of discussion elsewhere.

References and Notes

1. Sokal, A. and J., B., *Fashionable Nonsense*, Editions Odile Jacob, 1999.
2. Popper, K. R., *Conjectures and Refutations: The Growth of Scientific Knowledge*, pp. 33–39 BASIC BOOKS, Publishers, New York, London, 1962.
3. Einstein, A., "On the Electrodynamics of Moving Bodies" in *The Principle of Relativity*, English translation of the original Einstein A., *Zur Elektrodynamik bewegter Körper*, *Annalen der Physik*, **17**, 891–921, 1905, pp. 37–65 Dover, 1952.
4. Tribe, L. H., The Curvature of Constitutional Space: What Lawyers Can Learn From Modern Physics, *Harv. L. Rev.*, **103**, 1–40 (1989).
5. Einstein, A., Zur Quantentheorie der Strahlung, *Phys.ZS.*, **18**, 121–137 (1917).
6. Einstein, A., Die Plancksche Theorie der Strahlung und die Theorie der spezifischen Wärme, *Ann.Phys.*, **22**, 180–190 (1907).
7. Noninski, C. I., Energy and Heat of the Particles of a Thermodynamic System, *Khimia i Industria (Sofia)*, **6**, 172–177 (1964).
8. Einstein, A., Über die von der molekularinetischen Theorie der Wärme geforderte Bewegung von in ruhenden Flüssigkeiten suspendierten Teilchen, *Annalen der Physik*, **17**, 549–560 (1905).
9. Einstein, A., Über einen die Erzeugung und Verwandlung des Lichtes betreffenden heuristischen Gesichtspunkt, *Annalen*

- der Physik*, 17, 132–148 (1905).
10. Nauenberg, M., Gap in Einstein's Early Argument for Existence of Photons *Physics Today*, 58, 17–18 (2005).
 11. Stoletow, M. A., On a kind of electrical current produced by ultraviolet rays *Phil. Mag. and J. of Sci.*, 26, 317–319 (1888).
 12. Lenard, P., Ueber die lichtelektrische Wirkung *Annalen der Physik*, 4, 149–198 (1902).
 13. NOTE: to save space, henceforth all quantities are denoted as in the English translation of the respective papers.
 14. As the US Representative Lamar Smith has suggested.
 15. The author has heard in academia, in most seriousness, that "Einstein must be wrong in order to be right".