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реабилитации и курортологии Минздрава России,***Калинина Л.А.***врач – трансфузиолог,**МПО «Кооператив Мираздрав», г. Москва*<https://doi.org/10.5281/zenodo.13135467>**Abstract**

An analysis of scientific publications on non-drug therapy technologies and the regulatory influence of associated states of water and electronic activation of the body is presented. Based on a number of evidence-based scientific studies in the field of mechanisms of action of non-drug treatment methods (changes in the functional state, initiation of DNA transcription, mitochondrial activity, and others), a biophysical mechanism for the regulatory action of the associated water phase, which constitutes the fundamental basis of life, has been proposed.

A conceptual basis for the direction (wave medicine) has been proposed, ensuring the implementation of a strategy for maintaining and restoring field regulation of cellular metabolism based on the principles of quantum biophysics of water.

Keywords: light therapy, associated water, quantum biology, electron-donor activity, preventive medicine.

Introduction

Modern humanity is experiencing a critical phase of biosphere life, characterized by increasing instability of the relationship between man and the biosphere [1]. This instability on the human side is obviously manifested by a pandemic of non-infectious and infectious diseases, and on the biota side by the extinction of insect and animal species. In both cases, the reason is the same and it lies in the technogenic pressure on human health and the biota of the planet. However, the physical mechanisms of these cause-and-effect relationships remained unknown for a long time. In many ways, their study was hampered by subjective reasons, which, first of all, manifested itself in a lack of understanding of the regulatory role and energy function of water in cellular metabolism, as well as non-local interactions of electrons in the organizing associated phase of water [2,3].

A way out of this impasse is possible only on the basis of intellectual breakthroughs in understanding biosphere connections based on actually operating mechanisms of interaction between living organisms, includ-

ing humans, of course, with the biosphere. It is necessary to immediately focus not only doctors, but also specialists in interdisciplinary fields of knowledge of the Earth sciences, on the study of the primary cellular regulatory mechanisms that constitute the primary circuit of metabolic regulation, carried out through wave processes. It is important to understand that the neuro-humoral regulation of metabolism, which represents the secondary and tertiary control circuits of metabolic processes, is dependent on the primary regulatory circuit. It is disturbances in wave regulation, which modern medicine pays insufficient attention to, that are the dominant causes of metabolic diseases, including the weakening of immune defense against carriers of parasitic diseases.

Based on this understanding, discussed in more detail in a large series of scientific publications and a number of author's monographs, the priority area of medicine and, in particular, hygiene in its generalized presentation is Quantum Biophysics of Water. Quantum physics of water is a scientific approach to physical

concepts of water, studying quantum cooperative processes in it, and its particular section in relation to living organisms is quantum biophysics of water. The methodology of quantum physics of water is based on the study of critical phenomena [4] caused by phase transitions in the organizing phase of water, and quantum phenomena associated with macroscopic charge ordering and exchange processes in an open system [2,3]. Based on the concepts of quantum biophysics of water, priority innovative areas of hygiene and medicine in general are formulated, including interdisciplinary research in the field of Earth sciences, aimed at ensuring biospheric conditions for the safety of life.

The basis of wave regulation is body water, the study of which the authors have devoted the last quarter of a century. Let us emphasize once again that it is WATER, which has a complex structural organization, including the quantum properties of the electronic subsystem of its associates [2,3], that occupies a key place in maintaining life. The quantum behavior of water associates manifests itself not only in the production of regulatory signals, accumulation of environmental energy, transport functions, but also in such phenomena as non-local interaction. It is the latter property of water that is of fundamental importance for understanding the mechanisms of maintaining life, which can be considered as "a mode of existence of electronic quantum oscillators" [5].

In this regard, the purpose of this study is to integrate knowledge about cellular regulatory mechanisms based on the recognition of the dominant significance of the primary regulatory circuit - wave phenomena in cellular metabolism that occur under the influence of the electronic subsystem of the body's associated water phase.

1. Disadvantages of the known mechanisms of action of non-drug therapies

The health of modern man is weakened and for this reason previously widely used pharmacological drugs, mainly used as replacement therapy, turn out to be not only ineffective, but, moreover, dangerous. Drug correction of metabolic disorders does not eliminate the causes of diseases, which manifests itself not only in the form of side effects of drugs (drowsiness, dizziness, fatigue, nystagmus, nausea and memory loss), but also leads to an exacerbation of diseases and their transformation into more pathological conditions. For these reasons, non-drug treatment methods are increasingly used in clinical practice. Among them, methods based on the use of electric currents, electromagnetic and acoustic waves stand out: c low-level vetotherapy (LLLT) [6-10], electrotherapy [11], magnetic stimulation [12], extracorporeal shock wave lithotripsy [13, 14]. An important and valuable heritage of oriental medicine is reflexology (Zhen-Jiu, acupuncture) [15,16].

These methods of therapy, as well as the use of balneological factors, are characterized by insufficient evidence of effectiveness, which is largely a consequence of the lack of scientific understanding of the primary mechanisms and conditions leading to therapeutic effects.

It is now recognized that the mechanisms of the beneficial effects of laser radiation on the body are based on biological processes at the cellular and molecular levels [7], which suggests the presence of electrically active endogenous chromophores [6]. However, the paradox of such technologies lies in the effect of very low radiation intensities. In this case, molecular excitation of chromophores can only cause the emission of secondary radiation, without setting in motion a complex system of molecular mechanisms. Other scientific approaches are required that correspond to the essence of the processes occurring under low-intensity effects of physical factors on the body.

The fact that the first site of cell reaction to the effects of radiation is mitochondria with their electron transport chain indicates the appearance in the system of excess (relative to the initial state) electrons, which is also confirmed by a decrease in the redox potential of body water. The appearance of electrons leads to an increase in ATP production, modulation of reactive oxygen species and induction of the expression of TNF transcription factors, activation of DNA transcription and other metabolic effects. It is obvious that laser radiation itself does not supply electrons to the cell and does not have the ability to cause observable biochemical changes.

On the other hand, low-intensity laser beam therapy, as well as reflexology, affect the entire body, cells and tissues, and not just at the site of radiation or acupuncture (when using reflexology), and can change the metabolome profile [9]. There is also activation of DNA transcription, which leads to the synthesis of short-chain peptides. The combination of cytokines produced in the body obviously causes complex interdependent homeostatic changes at different levels, primarily in the nervous system, leading to the activation and inclusion of previously inactive neuronal connections in the process of functioning [15]. But the very appearance of cytokines in the cytoplasm of cells cannot be a direct consequence of exposure to laser, light radiation, or neuronal connections. Although the role of the nervous system in regulating the reactions of various body systems is great, nevertheless, the primary reaction of the body systems is associated with the transformation of the structural organization of the associated water phase in the body systems [2].

It seems paradoxical, but similar changes in the body both at the cellular and organismal levels occur when electron-donor media are used as therapeutic therapy (physically activated waters for both oral and cutaneous use [2,17,18]) and some balneological procedures (aeroionotherapy, apitherapy [5], etc.).

Obviously, the list of medical technologies that use the processes of activation of body systems through the implementation of the transfer of electrons from the outside into the water matrix and cells is not limited to the examples discussed above. It is important to note that all these technologies involve nonlocal processes of electron transfer. In this case, the structural organization of the electrically active phase of water, represented by associates, changes. In turn, associates perform an energy function and have a regulatory effect by

influencing the processes of keto-enol tautomerism and transport functions.

This ability of water associates to perform such unusual functions deserves special consideration.

2. Biophysics of water is a theoretical basis for describing the functioning of the primary regulatory circuit of cellular and organ metabolism

Considering the role of metastable states of water in the regulation of metabolic processes, it is advisable to dwell on general questions regarding the phenomenon of life itself. Life from an elementary cell to a whole organism is characterized by complexly organized behavior, which is based on the principles of emergence, which cannot be described from the standpoint of a "biochemical and molecular" approach [18]. The "biochemical and molecular" approach, popular in biology, medicine and genetics, is also unable to explain the most important properties of living systems to "feel" and "perceive" external stimuli [19]. Condensed matter physics, when limited to local, short-range, and perturbative approaches, also fails completely. This is also due to the role commonly attributed to water - in fact the main component of living matter, which has long been considered simply chemical (as a "solvent" or reactant/product). However, many data today show that living matter can be correctly represented as a superstructured coherent matrix formed on a water basis [20,21]

This is a promising theoretical approach, considered within the framework of "quantum biology" (QB), a science capable of solving such problems of living organisms as morphogenesis, adaptation, autopoiesis, memory, teleology, biosemiotics [21]. The theoretical basis of KB - quantum mechanics and its fundamental principles have been used to elucidate complex biological processes and molecular homeostasis, photosynthesis, enzyme-catalyzed reactions, magnetic perception, smell and vision, DNA fragmentation and transcription, cellular respiration, mitochondrial activity, and brain thinking and consciousness. All these attributes of living matter manifest themselves within the framework of quantum superposition, quantum coherence, and quantum entanglement, quantum tunneling and other effects [20-23]. However, modern "quantum" approaches in biology still remain "corpuscular", since they are based on semi-classical concepts. The further development of clinical medicine and medicine as its practical discipline requires rethinking based on the involvement of wave ideas about the basic component of living things - water [2].

The answers to these pressing questions of quantum biology are provided by a new scientific approach to water physics, which studies quantum cooperative processes in liquid water - quantum physics of water and its special branch in relation to living organisms - quantum biophysics of water (QWW). Quantum physics of water studies critical phenomena caused by phase transitions in the organizing phase of water, and quantum phenomena associated with macroscopic charge ordering in an open system [2,4,24]. A new understanding of the physics of water allows us to obtain answers to pressing problems of modern natural science, ranging from the lower levels of cooperative behavior of

water associated with the formation of a metastable phase of water, to quantum phenomena of non-local electron transfer and control of cellular biological processes, to global manifestations of self-organization of water in the planet's geosphere in the form electrophysical weather and climate controller.

Based on the scientific principles of "Biophysics of Water", water is a heterogeneous state of matter, characterized by a domain organization, the organizing phase of which is metastable polymorphic compounds. In water, such a phase is the phase of associated water, represented by polymorphic ices VI, VII, VIII (Wolrafen pentamers [25,26], stabilized by nanovoids and electrostatic charges in a delocalized state [2], possessing the properties of macroscopic self-organization.

At the heart of macroscopic quantum effects of self-organization is the concept of "quantum coherence," which, according to the views of Vladko Vedral and Seth Lloyd [27,28], plays a central role not only in physics and chemistry, but also in biological systems. A derivative of quantum coherence is the property of quantum nonlocality, which is understood as the connection of spatially separated states or processes without the mediation of local interaction carriers. Another interpretation of the term "nonlocality" assumes the presence of a quantum potential according to the de Broglie-Bohm theory [29], responsible for the interactions of events separated in space and time (the so-called transactional interpretation of quantum mechanics [30]). In quantum mechanics (Copenhagen interpretation) it is customary to call such connections non-local correlations, but not transactions (de Broglie-Bohm wave interpretation).

Biophysics of water as a science is the basis for understanding the patterns of relationship between all living things and the environment, affecting not only cellular metabolism as the fundamental basis of all living things, but also allows us to answer pressing problems in the development of civilization.

Modern classical science, despite enormous efforts in this area, is not able to determine the basic mechanisms underlying the pandemic of diseases, since it does not connect them with the macroscopic quantum states of water in biological structures, the spatial and temporal non-locality of the influencing physical environmental factors, as well as the biological significance of nuclear transformations of elements in the body and other manifestations of biosystems of quantum properties, in which water in its associated state performs the main functions of controlling biochemical processes, ensures the metabolic interaction of the cell with the environment and its protection from unfavorable factors.

The organism, through the phase of associated water, is also a macroscopic quantum system, each organ and each cell of which interacts not only with each other, but also with the environment. It is due to non-local connections that our health, or, conversely, ill health, has a significant dependence not only on what we drink and eat, but also on the electrophysical state of the environment. This connection is manifested through the exchange interaction of quantum oscillators, which results in the transfer of charge (electrons)

and information in the form of self-similar wave packets of electrons [3,31].

To implement these processes in living organisms, all its cellular structures are in an electrophysically nonequilibrium state, that is, they contain an excess negative charge, which determines the degree of their delocalization and, accordingly, the strength of the regulatory influence on intracellular processes and intercellular interactions.

An important aspect of the quantum behavior of the associated water phase both inside and outside the body is associated with the phenomenon of high-temperature superconductivity of water similar to the high-temperature superconductivity of granular glasses with on / off intermittency [32]. Its significance for Quantum Biology and Biophysics of Water lies in the fact that high-temperature superconductivity has the entire complex of properties of living organisms, including coherence, supersensitivity to external influences, the ability to convert various types of energy, non-local interaction and other properties of quantum objects [3].

Based on this, the phase of associated water in the body forms the primary circuit for the regulation of cellular metabolism, controlling biophysical and biochemical processes, including such functions as the initiation of DNA transcription, control of fragments of its nucleotide sequence, the cell cycle and other processes [33]. This is the basis for identifying medicine as an independent direction, focused on restoring the primary wave level of regulation of all biological processes in the body. The scope of competence of wave medicine and, in particular, wave hygiene also includes ensuring external conditions for human wave safety from man-made pressure on ecosystems. When considering the subject areas of wave medicine, it is necessary to proceed from the fact that the term "wave" does not mean electromagnetic waves, but waves of matter (electrons).

3. Wave medicine is a system of scientific substantiation and technologies for countering a pandemic of diseases of metabolic etiology

Wave medicine, the physical basis of which is Quantum Biophysics of Water and Quantum Biology, is a system of scientific concepts and technologies aimed at maintaining and restoring in the body the primary level of regulation of metabolic processes performed by the phase of associated water. The phase of associated water, the electronic component of which has the entire complex of properties inherent in living organisms, is the only and unique object that is responsible not only for regulatory functions in its cells, but also for interactions with the environment through electronic exchanges.

It is the latter feature of living organisms interacting with the environment that distinguishes wave medicine as an independent direction, since human health largely depends on the state of the environment.

When first considering the subject area of wave medicine, associations arise of some of its abstractness, but in practice, when using wave technologies, everything is concrete: those technologies that connect the body with sources of electrons in the environment have objectively high rates of therapeutic effect. For example, the latter, in addition to those listed above, include

biologically active natural compositions based on humic and fulvic acids, mechanically activated preparations, nature-like technologies, including technologies based on high-temperature superconductivity [5] and others.

The technological basis of wave medicine also includes the creation of generator equipment based on physical mechanisms for accumulating electrons from the environment and their coupling with the human body, which provides the possibility of restoring human health in stressful living conditions.

Technologies for physical activation of drinking and circulating (in centralized water supply and heating systems) water, which provide a systemic homeostatic effect on the human body due to the supply of electrons, have high prospects for therapeutic and preventive action. It is important to understand that these technologies have a prolonged effect not only through direct contact with activated media and objects, but also non-locally through quantum conjugation.

Another highly effective area of wave medicine includes the use of electronic matrices of tissue-specific drugs that have a targeted regulatory effect on individual systems of the body [34]. Electronic copies of bio-regulators are prepared on the basis of known compositions prepared from peptide-protein complexes of cell membranes [35,36]. However, for their effective and safe use, especially in multiple organ pathologies, it is necessary, first of all, to restore systemic regulation in the body through the use of electron-donor media or activating technologies.

The object of wave medicine is also the phase of associated water in the body itself, since its structural and physical state and the intensity of exchange electronic interactions change over time, especially during the aging process [5]. It can be said that the youth of the human and animal body can be restored by replacing structural defects in the phase of associated water (ortho-isomers of water with para-water, paramagnetic essential elements with non-magnetic isotopes, removal of deuterium and nuclear complexes [37]).

A separate area of wave medicine, requiring researchers of a new format, is associated with the possibilities of non-local transfer of wave information of DNA (wave genetics), first discovered by Nobel laureate Luc Montagnier [38,39,40].

There is an assumption that it is precisely the wave transfer of genetic information, realized during the process of fertilization of the egg, that implements the mechanism for the radical purification of DNA from defects in the structure of associated water, which is in complex with polynucleotides [41].

And finally, wave medicine, in terms of its component discipline - wave hygiene, is designed to provide safe (from the standpoint of the state of the geomagnetic background both in the places where humans and the biosphere are localized) conditions for the life of humans and animals. This problem is aggravated by the ever-increasing pressure on the ecosystems of various technologies that destroy the electronic state of the lithosphere and atmosphere of the planet, as can be judged by the decrease (by 10%) in the flux density of

the planet's magnetosphere, which serves as a non-local response of the electronic component of the Earth [42].

4. Methodological aspects of wave medicine

The discipline of "wave medicine" is interdisciplinary in nature, affecting related areas of life and Earth sciences. At the same time, the key points of new knowledge about human health are associated not only with specialized knowledge of a number of medical disciplines, but also with basic wave concepts from the field of low-temperature physics, quantum biology and the fundamentals of quantum mechanics, which predetermine the need for preliminary training of specialists in these areas of knowledge. It is obvious that the terminology established in various fields of knowledge will require some time and new developments aimed at connecting and unifying newly emerging scientific areas.

Another methodological feature of the discipline is associated with the need to overcome the existing stereotypes of classical biochemical thinking and accept the wave concept of quantum physics, now divided into two camps.

The methodological foundations and regulatory framework for the use of wave technologies in practice are based on a system of indicators of the bioenergetic activity of water, the biological compatibility of consumer products and medications, and the quantum potential of the living environment.

Within the framework of the methodology of wave medicine, in particular its section – wave hygiene, aimed at preventing diseases of metabolic etiology, a system of government regulation measures is needed in the field of the current area of life safety, called "geoelectronic safety", which should include:

- a set of regulations to limit the use for research, technological and military purposes of technologies based on the accumulation of electron energy scattered in the geosphere or its dissipation (cold plasma technologies);
- a set of regulations to change the requirements for food quality, drinking and sanitary water, coolants in building heating systems, residential and industrial environments, including electrical and radio-electronic equipment in terms of human bioenergy safety;
- measures to limit the technogenic load on urban ecosystems, aimed at restoring the electron-donor activity of soils, which are the main reservoir of electrons in a delocalized state and a source of air ions in the atmosphere;

The introduction into practice of state regulation measures in the field of geoelectronic security will make it possible to stop the developing epidemic situation, manifested in the growth of non-infectious morbidity, mass mental disorders, endoecological disaster (intoxication of the human body, animals, plants) in the biosphere, threatening human existence.

Comparing the relationship between geoelectronic safety and chemical and biological safety, it should be noted that other areas of safety are subordinate to geoelectronic safety, since the influence of toxicants and pathogens, as well as the "human factor" of technosphere accidents, manifest their effect on the body

through suppression of the immune system, hormonal disorders regulation, other systemic changes in cellular metabolism initiated by electron-deficient conditions of the environment and drinking water. Maintaining the electronic imbalance of living organisms is a system-forming factor in the homeostasis of living organisms and humans, which is the main object of regulation in the geoelectronic security system.

Drinking water has a special place in the system of human geoelectronic security as one of the main ways to replenish electron deficiency in the body, which can be implemented in conditions of electron-deficient environmental conditions. Other food products, including tea, juices, and drinks do not have this ability, since the ionic compounds in their composition are more durable compared to the relatively stable anion-radical forms of oxygen and cannot provide the body with electrons to maintain the stability of the hydration structures of membranes and organelles, as well as oscillatory processes in cells.

In the issues under discussion, it is necessary to particularly focus on the influence of the bioenergetic activity of bottled waters on the human body. Bioenergetically active water is electrically nonequilibrium water with metastable associates of anion-radical forms of oxygen as carriers of electrons, the decay of which ensures the influx of electrons to the cellular receptors of a living organism and the maintenance of electrical nonequilibrium in cells and organ structures, necessary for the stable functioning of macroscopic quantum oscillators of the associated water phase.

The properties of drinking bottled water reflect the global changes in the electrophysical state of the planet that have occurred in recent decades, which negatively affect both the human body and the bioenergetic activity of bottled water, which is subjected to destructive effects during multi-stage water treatment processes. Drinking water with low values of bioenergetic activity, determined by the degree of its charge (electronic) nonequilibrium, belongs to biologically inert media.

The energy inertness of drinking water is reflected at the cellular level by a decrease in hydration energy, difficulties in conformational transitions in proteins and cell membranes, a decrease in the rate of transfer and degree of transformation of metabolites due to an increase in energy barriers to electron transfer and dehydration of its membranes, and an increase in the tension of energy-supplying cell organelles. Such changes lead to disruptions in the functioning of regulatory mechanisms, accompanied by metabolic disorders, and, as an extreme manifestation, the promotion of temporary anabiosis of cells.

The entry of inert water into the body is also accompanied by a decrease in the effectiveness of the antioxidant defense system, an increase in the levels of cell aberrations and the possible manifestation of mitotic activity of altered cells, including cells of parasitic organisms, permanently or temporarily present in the intercellular space.

The lack of electrons entering the body when taking inert water may be accompanied by unfavorable changes in the cell cycle - disturbances in the expres-

sion of operons, a high probability of “skipping” “restriction points” by functionally altered cells, during which damaged cells are rejected and the possibility of their degeneration into cancer cells appears. [2].

Emerging systemic imbalances in the activity of cell organelles negatively affect the balance of hormonal regulation and, in general, with constant consumption of such bioenergetically inert water - the appearance of imbalances in the activity of the human body systems and its vulnerability to toxins, pathogens, physical and other stresses [2]. Subsequently, these imbalances manifest themselves in one form or another of diseases, as well as in contamination of the intercellular environment with toxins (endoecological catastrophe [43,44]).

In this regard, new technologies for producing bioenergetically active waters, which can significantly compensate for the negative effect on human health in electron-deficient environmental conditions, are becoming relevant. The use of technologies for the production of bioenergy-active drinking water will not only reduce the incidence of disease in the population, but will also serve as an effective mechanism for productive human longevity.

Main directions of wave medicine:

1. Associated states of water: historical background of the formation of views on the structural and physical state of water, methods of observing associated water, theoretical ideas of the processes of formation of associated water, properties of the phase.
2. Scientific provisions on the primary regulation of metabolic processes in cells and body systems based on field interactions of associated states of water.
3. Physical ideas about the mechanisms of self-organization and wave transfer of electrons in aqueous media and their use in restorative medicine technologies based on quantum mixing and wave transfer of biological information.
4. Scientific foundations and regulatory framework for environmental hygiene, preventive, restorative and therapeutic medicine based on ensuring the sustainability of non-local wave interactions of living organisms with the biosphere.
5. Methodology and quantum technologies of restorative, preventive and therapeutic medicine using nature-like technologies, including those based on high-temperature superconducting materials, electron-donor media and organ-specialized aqueous preparations.
6. Physical conditions for the metabolic interaction of the organism with the environment. The influence of the “electronic deficiency” factor on the state of ecosystems and human health. Providing favorable environmental (electron-donor) conditions for the population, developing agricultural production and solving a complex of other problems of the national economy.

Conclusion

In a small article, the authors did not set out to cover all the medical aspects of non-drug therapy, limiting themselves to the key points of the regulatory action of the body's associated water phase and its non-local interaction, which underlie the wave (quantum) concept of life.

According to the authors, the new discipline - wave medicine methodologically combines the known technologies of both Western and Eastern medicine, putting at the forefront the regulatory processes carried out by a special state of water - the phase of associated water, stabilized by electric charges (electrons) and capable of field interaction with the environment thanks to the complex properties of the superconducting state of its electronic subsystem.

Instrumental and methodological implementation of the methodology for non-local diagnostics and correction of the functional state of human body systems, based on established patterns of exchange electronic interaction between water structures, allows you to register quantum information about an object (organism) according to the emission characteristics of the Bose condensate of electrons in water (quantum diagnostics of the state of body systems) and carry out correction of human body systems using a non-local feedback system.

Considering the dependence of human health on the electronic state of the environment (quantum potential), technologies for compensating for the lack of electrons (and therefore restoring the associated water phase) in the human body, as well as in any other organism, are taking priority. But this is not enough for the safe development of the biosphere and maintaining the sustainability of society. Measures are needed aimed at limiting the impact of the technosphere on the lithosphere, which is the main reservoir of geomagnetic energy, replenished due to the transformation of solar energy, and the human environment.

In general, new knowledge makes it possible to establish the leading role of associated water in the homeostasis of the body, the electronic exchange interaction of the body with the natural environment, which is non-local in nature. The new paradigm of hygiene, preventive and integrative medicine, implemented on the basis of quantum technologies of wave medicine, will make it possible to stop the dangerous growth trends of both non-infectious and infectious morbidity of the population.

Wave medicine technologies are in demand not only by the current needs of the population to correct their health, but also create a scientific and methodological basis for overcoming the dangerous tendency of a pandemic of metabolic diseases to develop into a biosphere catastrophe.

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