

Knowledge of the Mechanism of Dreams can Aid in Problems Related to Room-Temperature Superconductivity

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Abstract High – temperature superconductors are required in many fields of modern technology. However the difficulties related to creation of low temperature conditions for superconductors and the labor-intensive production and operation are hinder their widespread application. After analyzing the possible causative mechanism of dreams, I surmised that in order to signals from the information field penetrating through the sleeper’s eyes into a brain during the rapid eye movement sleep, axoplasm of neurons must possess a high conductivity. I then inferred that this high conductivity was due to the effect of the cranial bones. These bones apparently protect the brain not only from physical injuries but also from various kinds of wave “noise”; this noise produces oscillating motions of positive ions in the axoplasm of neurons, and, as a result, electrical resistance is increased. I measured the electrical resistance of a number of metallic conductors, which I coated with materials of various compositions and found that when nichrome wires were covered with clean bone glue, there was a conspicuous decrease in this resistance; in conductors containing iron, covered with clean bone glue, the resistance decreased to zero. If a thin layer of bone glue is covered with Moment rubber glue, the coating of ardent superconductor becomes elastic that makes the superconductor shockproof and resistant to moisture and magnetic fields and thus promising for modern engineering.

Keywords: *dreams, conductivity of neurons, coated metallic conductors, ardent superconductivity*

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1. Introduction

High-temperature superconductors are used in many fields of modern technology. However, several obstacles prevent the widespread use of such superconductors. The first of these is the complex issue of creating constant low temperatures that allow the superconductors to function properly [1]. It has been reported that superconductors containing iron (pnictides) require lower temperatures than cuprates [2]. Studies of the internal structure of cuprates and pnictides led researchers to the idea that a superconductor is like a hamburger, in which the electric current flows through the “meat,” while the “buns” act as a supplier of electrons [1]. The meat in those crystal sandwiches is represented by layers of copper oxide or iron pnictides, composed of alternating layers of atoms. Examination of thin films that cover the crystal substratum under high magnification revealed that the cuprate coating consists of spiral ladders with a screw displacement; this structure produces twisting in the lines of the magnetic field and facilitates high-temperature superconductivity [3]. In the CuO₂ layers, all the atoms were at almost the same level. However, in the FeAs layers, the arsenic atoms were situated above or below the iron atoms, and four arsenic atoms, surrounding each iron

atom, were located at the tops of a tetrahedron [2,4]. The crystal lattices of recently synthesized superconductors also have a tetragonal structure [5,6,7]. Approaching the critical temperature for creation the tetragonal structure appears to be an important factor in the superconductivity of pnictides [2,4,5]. It appears likely that the pyramidal structure protects the conductor from the noise produced by electromagnetic and sound waves, which cause oscillations in the positive ions and thereby hinder the flow of electrons. It has long been known that placing conductors within a pyramid increases the temperature at which superconductivity appears [8]. A number of studies have investigated the changes in the long-range stripe-similar sequence at the critical temperature, which promotes the occurrence of high-temperature superconductivity [9]. Quasiparticle interference, in which particle-like behavior disappears as a result of defects in a material, creates standing waves and promotes superconductivity [10]. Based on the above observations, I conclude that when a conductor is isolated from electromagnetic and sound waves, the positive ions in the conductor’s crystal lattice go into a dormant state and do not impede the flow of electrons.

There is an ongoing search for new materials that can function as superconductors [2,4,5,6,7], however, solving the problem of room-temperature superconductivity has

reached an impasse. Practically all existing inorganic substances have been subjected to trials as part of this search, but no superconductivity at room temperature has been found [11]. Previous research efforts have examined the phenomenon of superconductivity particularly with regard to the doping used in the conductors [12,13], and it appeared that such a doping should certainly not be metallic [2,6]. However, no tests have been conducted on a coating similar to bone tissue.

The purpose of the present study is finding materials for coating of conductors, which are capable to reduce the electrical resistance in them.

2. Materials and Methods

To determine the possible influence of the cranial bones on the conductivity of neurons, I covered metal conductors with bone glue, which has been used by carpenters over the past century for gluing wood. Bone is a calcified connective tissue, composed of cells within a solid basic substance. Approximately 30% of this basic substance consists of organic compounds, mostly in the form of collagen fibers, and the remaining 70% is inorganic. The major inorganic component of bone is hydroxyapatite— $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$, but bone also contains various amounts of sodium, magnesium, potassium, chlorine, fluorine, carbonates, and citrates [14]. To determine the optimum coatings for the conductors, I tested several compounds, including pure bone glue.

Instruments. For the conductors, I used mostly nichrome and iron wires and also a foreign-made immersion water heater with a stainless steel sheath (Weltor, Inc.). To measure the resistance of the conductors, I utilized a household multimeter, DT-831 (ASD-Electro, Inc.) with a range of 200 ohms and resolution of 0.1 ohm. The following used conductor coatings were examined under a scanning electron microscope, EVO-40 (Carl Zeiss, Inc. Germany): pure bone glue; a dried mixture of superphosphate— $\text{Ca}(\text{H}_2\text{PO}_4)_2$ —and chalk (CaCO_3); a mixture of bone glue and $\text{CaCO}_3 + \text{Ca}(\text{H}_2\text{PO}_4)_2$; a mixture of bone glue and superphosphate— $\text{Ca}(\text{H}_2\text{PO}_4)_2$.

Making the bone glue and mixtures. I made the pure bone glue coating in a thermostatic water bath (by using a container with heated water, in which another container with bone glue granules (Bone Glue, Usolsk Glue Factory, Russia) and water was placed). The weight ratio of bone glue and water in the inner container was 1:1 and the temperature kept at 65–70°C. The bone glue mixtures were produced using the thermostatic water bath by mixing the bone glue with salts or Moment rubber glue (produced of Henkel AG & Co. KGaA, Germany).

Coating variants. Thirty eight pieces of 0.2-mm-diameter nichrome wire were degreased by gasoline and then, after measuring their resistance, dipped into the following media: (1) Moment rubber glue; (2) bone glue, melted in the thermostatic water bath; (3) humidified superphosphate— $\text{Ca}(\text{H}_2\text{PO}_4)_2$ —mixed with the melted bone glue in the proportion of 50:50; (4) a mixture in which three-quarters of the volume was $\text{CaCO}_3 + \text{Ca}(\text{H}_2\text{PO}_4)_2$ and one-quarter was melted bone glue; (5) a mixture in which three-quarters of the volume was melted bone glue and one-quarter was Moment rubber glue. The pieces of wire were immersed in the glue for no longer than one minute. Resistance was measured in a 1.5-mm-

diameter iron wire as well as in the water heater, in which the diameter of the stainless steel sheath was 4.0 mm. Then, the pieces of wire were immersed in the melted bone glue. After the conductors were removed from the glue, they were air-dried for six hours, and then their resistance was measured. After removal from the water bath, the thickness of bone glue on water heater was 0.5 mm. I then decreased the thickness of the bone glue layer to 0.05 mm by immersion it in the hot water. After drying the conductor again, I measured the resistance of the sheath, then dipped the conductor in the Moment rubber glue, dried it, and again measured the resistance. I then attached several household magnets to the sheath and measured the resistance.

Statistics. Data were analyzed using the STATISTICA StatSoft (6.0 Version). The results were expressed as means and with a 95% confidence interval. The Kolmogorov-Smirnov test was employed to analyze the normal distribution of the variables ($p > 0.05$). The data followed a normal distribution and were therefore analyzed using parametric tests. Student's *t* test for dependent samples was utilized to assess the differences in the resistance of electric current in the nichrome wires before and after the coverings were applied. For graphical representation of the data, non-metric multidimensional scaling ordination was carried out using the Bray-Curtis distance. Before calculation, the data were transformed according to Clarke and Green [15]. For each variant, I coated 5–11 nichrome wires and also the sheath of the water heater and a 1.5-mm-diameter iron wire. In all the cases, 40 conductors were used.

3. Results

It was found that in a 0.2-mm-diameter nichrome wire, which was coiled into a spiral with a 7-mm diameter and covered with the experimental composition, the electrical resistance did not decrease at ordinary room temperature. The electrical resistance also showed no reduction when the wire in the spiral was stretched to twice its original length. This was probably due to the magnetic field generated by the electric current as it passed through the spiral wire. It has long been known that magnetic fields destroy superconductivity [13]. The experimental coatings decreased the resistance after the wire was wound into large coils (100.0 mm in diameter) or folded in the form of a zigzag. With the iron wire, the resistance decreased to zero (Figure 1). The initial resistance of the water heater with the stainless steel sheath was 6.3 ohms (Figure 2b); after the sheath was coated with a 0.5-mm-thick layer of bone glue, resistance in the sheath decreased to zero at room temperature (Figure 2c). Bone glue is an insulator (Figure 2d). Thinning the layer of bone glue to a thickness of 0.05 mm caused the resistance in the sheath to increase to 4.5 ohms. However, after the heater was covered with Moment rubber glue and then allowed to dry, the resistance once again decreased to zero. Placing ordinary magnets on the heater did not affect its the electrical resistance. Electrical resistance in a 1.5-mm-diameter iron wire after the bone glue as well decreased to zero at room temperature as well (Figure 2f). Five days after the conducting the resistance measurements, I repeated the tests, and the results I obtained were close to the initial ones.

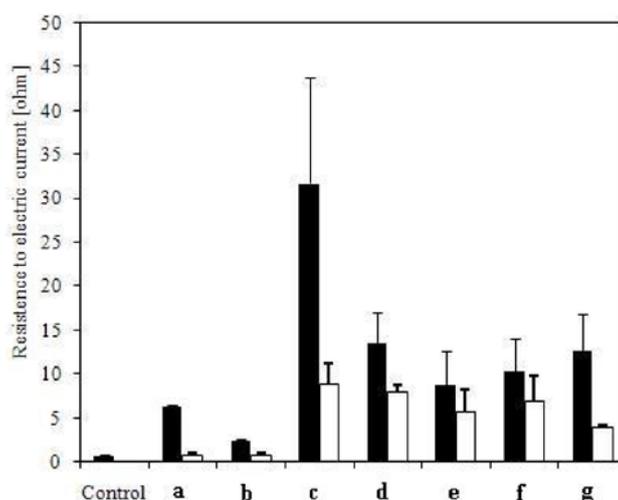


Figure 1. Variations in the electrical resistance (ohms, 20°C) of conductors with various coatings. The control instrument reading in the experiments was in the absence of a conductor. (a) Resistance in the 4.0-mm-diameter sheath of the water heater before (black) and after (white) coating with bone glue; (b) resistance in a 1.5-mm-diameter iron wire before (black) and after (white) coating with bone glue; (c) resistance in a 0.2-mm-diameter nichrome wire before (black) and after (white) coating with bone glue; (d) resistance in a 0.2-mm-diameter nichrome wire before (black) and after (white) coating with Moment rubber glue; (e) resistance in a 0.2-mm-diameter nichrome wire before (black) and after (white) coating with a mixture of bone glue and Moment rubber glue; (f) resistance in a 0.2-mm-diameter nichrome wire before (black) and after (white) coating with a mixture of salts— $\text{Ca}(\text{H}_2\text{PO}_4)_2 + \text{CaCO}_3$ —and bone glue; (g) resistance in a 0.2-mm-diameter nichrome wire before (black) and after (white) coating with a mixture of superphosphate— $\text{Ca}(\text{H}_2\text{PO}_4)_2$ —and bone glue.

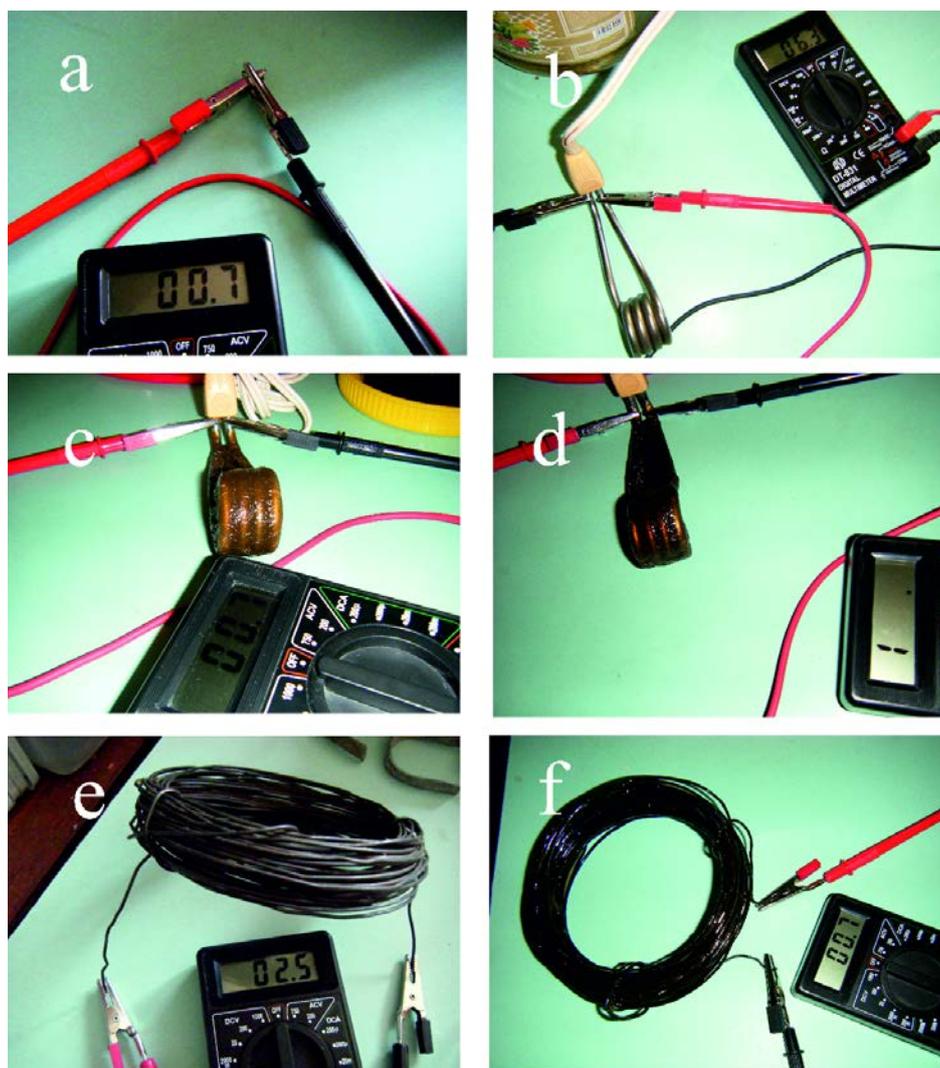


Figure 2. Measuring the electrical resistance (ohms, 20°C) in a conductor containing iron. (a) The control instrument reading in the experiments was in the absence of a conductor; (b) electrical resistance in the sheath of the water heater before the covering was applied; (c) electrical resistance in the sheath of the water heater after the bone glue was applied; (d) electrical resistance of the covering; (e) electrical resistance in a 1.5-mm-diameter iron wire before the covering was applied; (f) electrical resistance in a 1.5-mm-diameter iron wire after the bone glue was applied.

There was a statistically significant difference between the initial electrical resistance in the nichrome wires and the resistance after coating: $t(40) = 3.409$; $df = 39$; $p = 0.0015$. When the nichrome wire was covered with bone glue, the difference between the initial electrical resistance in the nichrome wires and the resistance after coating was as follows: $t(11) = 2.32$; $df = 10$; $p = 0.043$. When the nichrome wire was covered with Moment rubber glue, the

difference between the initial electrical resistance in the nichrome wires and the resistance after coating was as follows: $t(10) = 2.88$; $df = 9$; $p = 0.018$. Non-metric multidimensional scaling analysis showed that the coating of bone glue and mixture of bone glue with $\text{Ca}(\text{H}_2\text{PO}_4)_2 + \text{CaCO}_3$ produced the greatest decrease in resistance in the nichrome wire (Figure 3).

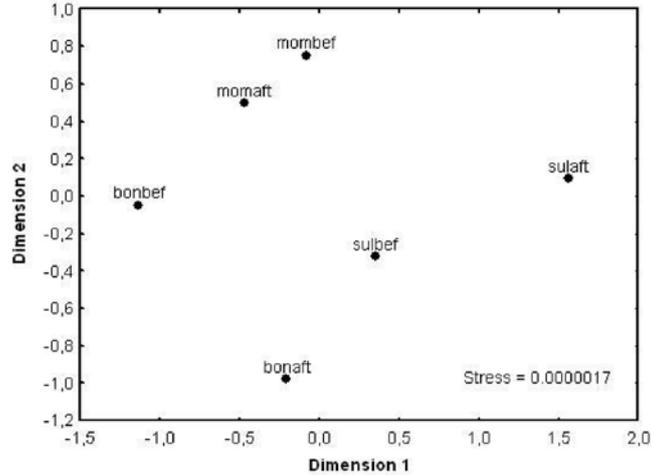


Figure 3. Non-metric multidimensional scaling ordination analyses of electrical resistance in the nichrome wires before and after the different coatings were applied. Bonbef = before covering with bone glue, bonaft = after covering with bone glue, mombef = before covering with Moment rubber glue, momaft = after covering with Moment rubber glue, sulbef = before covering with a mixture of salts and bone glue, sulaft = after covering with a mixture of salts and bone glue.

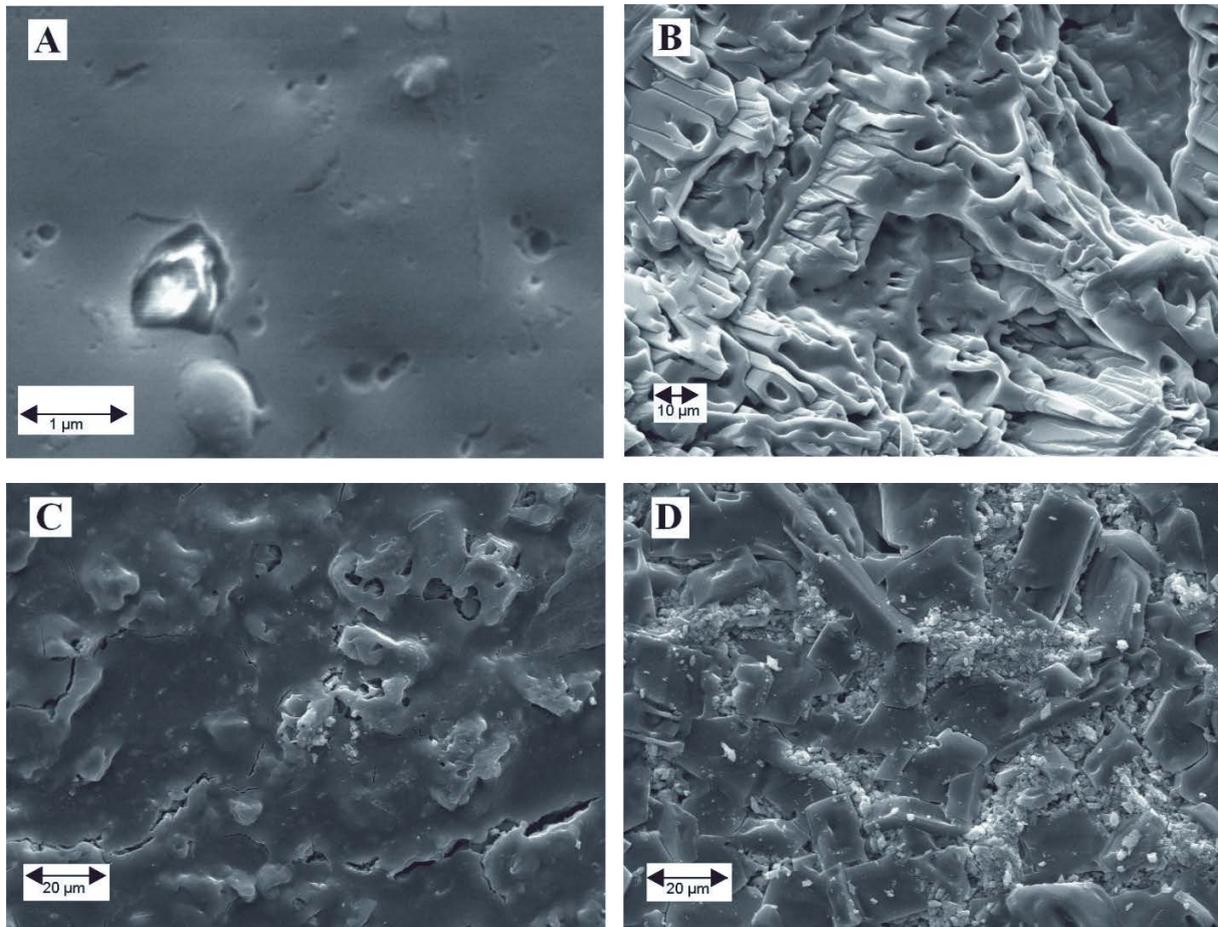


Figure 4. View of the coatings at high magnification. (A) The pure bone glue had cavities owing to microbubbles of air; (B) dried salts— $\text{Ca}(\text{H}_2\text{PO}_4)_2 + \text{CaCO}_3$ —obtained by mixing with water under carbon dioxide aeration show no structural disturbances; (C) the mixture of bone glue and salts— $\text{Ca}(\text{H}_2\text{PO}_4)_2 + \text{CaCO}_3$ —displays disturbances in its structure; (D) the mixture of bone glue and superphosphate— $\text{Ca}(\text{H}_2\text{PO}_4)_2$ —had disturbances in its structure.

Under a scanning electron microscope, it was evident that the various coatings showed defects in their structure; these defects were 0.5–40.0 μm in size (Figure 4). The coating that provided the greatest decrease in resistance in the conductors (bone glue) had defects that measured about 1.0 μm .

4. Discussion

Many useful mechanisms and devices cannot be created because the problem of superconductivity at room temperature is not solved yet. Now superconductors are cooled by liquid nitrogen, that anyway considerably complicates of their use. However my analysis of the literature has allowed to conclude that low temperature is not necessary for superconductivity to appear. The discovery of high-temperature superconductivity in the mid-1980s [1,2] overthrew the idea of temperature being a major factor in producing superconductivity. It became clear that a great deal depends on the composition of the doping used in such conductors [12,13,16]. At the same time, the conductivity of an electrical pulse in neurons of a brain is increased by other way. For appearance of dream, a key switch in the hypothalamus disconnects stimulations to the thalamus and cortex, and the system passes in dream [17]. Sleep is an active cerebral process and it consists of two completely different states—non-rapid eye movement (NREM) and rapid eye movement (REM) sleep. These states differ from each other just as sleeping and waking do [18]. According to the “scanning hypothesis”, movement of eyes during REM sleep coincides with the subject matter of the dreams [19]. In cells of neurons every waking moment, dozens of various reactions take place in neurons, and these reactions generate “noise”, which is manifested as electric oscillations; any extrasensory information that may be received during the waking state cannot be properly processed. During sleep, the workload for the eyes is practically zero, the “noise” subsides, and the overall energy demands for processing signals from the sense is considerably reduced [20]. After REM sleep was discovered, it was found that the inflow of sensory information and motor output during this period are simultaneously blocked [21]. Thus, during REM sleep, the conditions are suitable for “messages” from the information field to be delivered by way of electromagnetic signals to the analytic center of the brain, which are processed by means of released energy resources and generate dreams [20]. I hypothesize that signals from the information field are able to penetrate in the brain and become fixed in the memory via the eyes. This is explained by the fact that dreams can have color, which is created by the participation of pigments in the eye. Signals from the information field have to penetrate through closed eyes and be transmitted to the brain, where they become fixed in memory in the form of images, and thus the images are effectively “seen” by the eyes. Nerve impulses from photoreceptors in the retina are transferred to the brain via the optic nerve (which consists of millions of single fibers). The first area in which the signals are reduced is the lateral geniculate body of the thalamus, therefrom nerve fibers transport it to the primary visual cortex on the occipital lobe of the brain [22]. After the signal has been transformed into visual information, it is

sent in the form of an image to the hippocampus, where it is memorized [23]. A signal from the information field thus needs to possess high conductivity to pass along this route, and the cranium bones, apparently, promote high conductivity.

I covered metallic conductors with several kinds of coatings that had a composition similar to that of the cranial bones. My results showed that when nichrome wires were coated, there was a significant reduction in the electrical resistance. The greatest reduction in resistance was observed when the wires were covered by clean bone glue. When this coating was used on iron conductors, the electrical resistance was reduced to zero.

5. Conclusion

In the present study, I have demonstrated that metallic conductors exhibit considerably decreased electrical resistance at room temperature when coated with bone glue; when a conductor contains iron, the resistance falls to zero. Covering conductors with a thin layer of bone glue plus Moment rubber glue imparts elasticity, resistance to impacts, moisture and magnetic, fields to conductors without loss of superconductivity. The results of this study demonstrate that it is possible to create a coating for conductors that decreases electrical resistance to zero. Probably, there are synthetic coatings, which do not yield to bone glue in reduction of resistance in conductors, but harden faster.

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