

**Electrocardiography and its History in the Reflecting the Means of Collecting****Konstantin Anatolyevich Bugaevsky***The Petro Mohyla Black Sea State University, Nikolaev, Ukraine***\*Corresponding Author**

Konstantin Anatolyevich Bugaevsky, The Petro Mohyla Black Sea State University, Nikolaev, Ukraine.

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*The article presents the results of the research concerning the presentation of the history of creation and practical application in various branches of medicine of such a method of research as electrocardiography and reflection of history and practice of ECG in such types of collecting as philately and faleristics. Postage stamps, envelopes and other philatelic material devoted to ECG and famous native and foreign scientists, connected with creation and introduction in practice of this method of research, are presented in the work. The article also presents commemorative medals and badges related to electrocardiography and issued in different years. The article is of interest for a wide range of readers.*

**Keywords:** Electrocardiography, Philately, Postage Stamps, Envelopes, Faleristics, Commemorative Medals, Badges**Introduction**

I would like to start my short story about the first steps in the creation and introduction into medical practice of such a demanded and diagnostically valuable method of studying the human heart, as electrocardiography (ECG), with a little information about the creator of ECG Willem Einthoven. Willem Einthoven was a Dutch physiologist of Jewish origin. He graduated in 1885 from the University of Utrecht. Since 1885, professor of physiology at the University of Leiden. Main works in electrophysiology. Mathematical analysis of electrocardiograms allowed Einthoven to make significant clarifications in the deciphering of the heart's electrical reactions. In 1903 with the creation of a string galvanometer, Einthoven laid the foundation for clinical electrocardiography. Einthoven's own idea of the three leads of the heart currents, the triangle diagram (Einthoven's triangle), illustrating the change in the height of the electrocardiogram waves and their interaction depending on the lead mode, the physiological explanation of each wave and interval of the electrocardiogram. In 1913, he suggested vectorcardiography. One of the first researchers in the field of neuroelectrophysiology. Revealed impulse activity in the so-called depressor nerve, registered impulse activity in the sympathetic system nerve pathways. Winner of the Nobel Prize (1924). He died on September 29, 1927 [1-3].

**Materials and Methods**

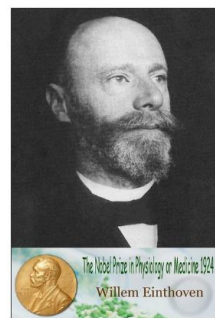
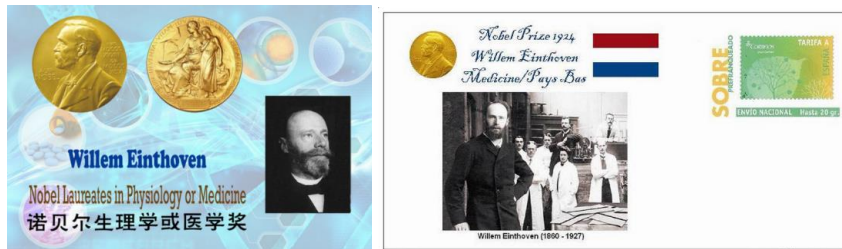
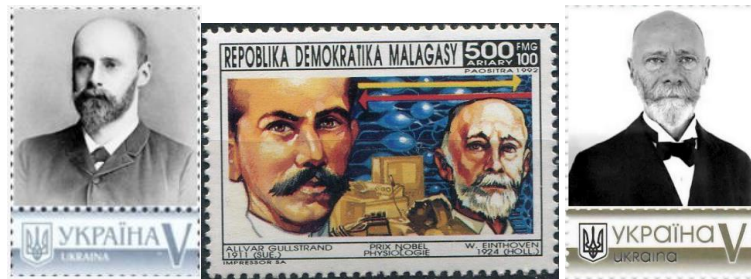
To conduct this research, with the help of various information sources, such as Internet pages and specialized sites for collectors, specialized philatelic and numismatic catalogs, thematic articles in special editions, the information of interest was selected, which was systematized and analyzed. The most interesting and colorful illustrations, designed as screenshots of stamps, envelopes, medals and coins, with corresponding references to the source of information on the screenshots used further by the author as illustrations in one or another section of the article, were selected. When selecting illustrative and textual materials, the author took into account the requirements concerning copyrights. The author excludes any conflict of interest when writing this article.

**Aim Article**

The purpose of this article is to present the results of a study devoted to the extent to which collecting media, particularly philately and numismatics, reflect the history and development of such medical fields as osteopathy and chiropractic.

**Results and Discussion**

A number of philatelic materials (postage stamps, envelope and post cards) are dedicated to this famous scientist and Nobel Prize winner in the field of physiology and medicine, presented in [4,5].



**Figure 1:** Philatelic Materials Dedicated to Willem Einthoven

Quite interesting, both from the point of view of historical value and collection, is a commemorative medal dedicated to W. Einthoven. Einthoven, which is shown in (obverse and reverse). On its obverse, in the middle, is a portrait of the scientist, his first and last name “WILLEM EINTHOVEN”, with the dates of his life, with an image of a human heart in the background and an inscription in English on the lower edge of the medal that reads

“Inventor of the electrocardiograph”. [6]. The reverse of the medal shows the stages of a patient’s examination, including his blood pressure measurement and the ECG process, with the inscription at the top of the medal “EKG” and “Graphical recording of the heart rhythm” [3,6]. In addition, in the same figure, presented, in obverse and reverse, two more commemorative medals dedicated to this scientist [3].



**Figure 2:** Commemorative Medals Dedicated to W Einthoven and ECG

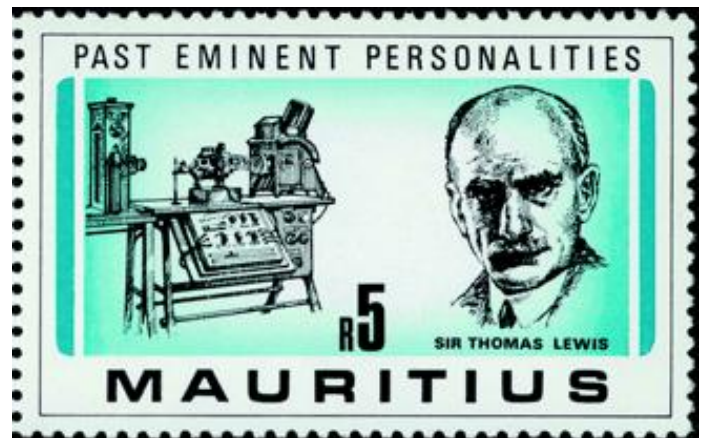
Continuing the story about the introduction of ECG methods into medical practice, it is impossible not to mention the German scientist Theodore Brugsche. Various scientific sources of information state the following: “German clinician, full member of the German Academy of Sciences in Berlin (1949). He received his medical education in Berlin (1903). Head of the University Clinic in Halle since 1927. In connection with the establishment of fascist regime in 1935, he left the clinic. In 1945, he became head of the therapeutic clinic at Charité [2,7]. His main works are devoted to constitution (biology of personality), physiology and pathology of metabolism, dietetics, bile formation and biliary excretion,

diagnostics of internal diseases, infectious diseases, and cardiology. He founded (1946) and was the permanent editor of “Zeitschrift Fur Die Gesamte Innere Medizin Und Ihre Grenzgebiete”. He was an active scientist, who contributed to the introduction of ECG method in medical practice. He was the honorary member of the All-Union Scientific Society of Physicians (1956). National Award of the GDR (1956)” [2,7]. Theodore Brugsch, a pioneer of practical application of ECG in practice of German cardiology clinics, is devoted to GDR postage stamp and commemorative medals, presented in [4,5].



**Figure 3:** GDR Postage Stamp and Commemorative Medals Dedicated to Thomas Bruges

There is interesting information about one of the researchers and innovators of ECG method introduction into cardiology and practical medicine, Sir Thomas Lewis. In 1916, Thomas Lewis experimentally determined the sequence and timing of the spread of excitation in different parts of the ventricular myocardium. He was the first to introduce the concept of the electrical vector of the heart. According to Wikipedia, in the section devoted to the scientist, it says: “While still an intern, Lewis began physiological research, conducting a fundamental study of the heart, pulse and blood pressure. From 1906, he corresponded with the Dutch physiologist Willem Einthoven, interested in the invention of the string galvanometer and electrocardiography. Lewis later became the first to use the novelty in a clinical setting. Because of this, Lewis is considered the father of clinical cardiacelectrophysiology. The first use of electrocardiography in clinical medicine dates back to 1908: in this year, Thomas Lewis and Arthur McNulty (later Chief Medical Officer of the United Kingdom) used electrocardiography to diagnose heart block. In 1909, together with James McKenzie, Lewis founded *Heart: A Journal for the Study of the Circulation*, which he renamed, *Clinical Science* in 1933. In 1913 Lewis published *Clinical Electrocardiography*, the first monograph on electrocardiography.” [2,8,9]. is a postage stamp of the island of Mauritius dedicated to Sir Thomas Lewis [4,5,9].

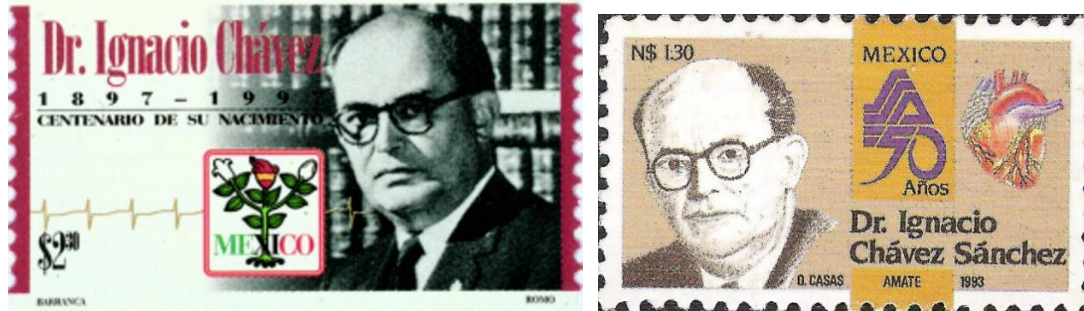


**Figure 4:** Postage Stamp Commemorating Sir Thomas Lewis and the First ECG Machines

Interesting data about Dr. Ignacio Chávez Sánchez (Chávez Sánchez Ignacio) - 1897-1979. Mexican cardiologist and organizer of medical science in Mexico. He graduated from San Nicolas National College in Morelia, and studied in Europe. In 1923-1950, he was professor of clinical medicine at the National Autonomous University in Mexico City. Founder of the Mexican Society of Cardiology (1935) and the National Heart Institute (1944; until 1966 its director, since 1966 director emeritus). Rector of the Autonomous National University of Mexico in Mexico City, 1961-1966. Honorary president of International Society of Cardiology;

member of medical academies of several countries. Author of works on cardiology: Heart Diseases, Their Surgical Treatment and Complications (1945), Lectures on Clinical Cardiology (1947), Contribution of Mexico to Medical Science (1947) [6].

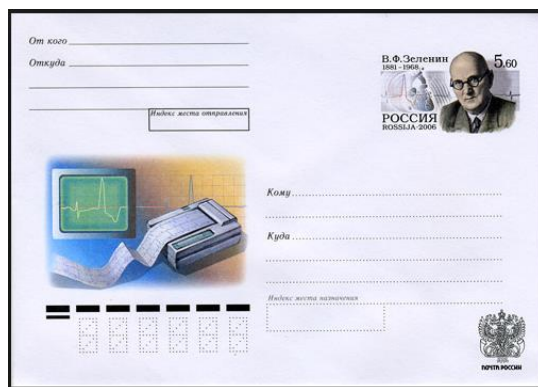
He initiated the broad, widespread use of ECG in daily practice, not only in cardiology clinics, but also in general medical clinical practice. Shows postage stamps devoted to this scientist [9].



**Figure 5:** Postage Stamps Dedicated to Ignacio Chávez Sánchez

We would like to say separately about the famous Soviet therapist VF Zelenin and his contribution to the practical application of ECG in clinical medicine. According to modern studies, “In the first half of 1910s VF Zelenin besides his dissertation - an experimental study “Changes of electrocardiogram under the influence of pharmacological agents of digitalis group” (1911) - published an article “Electrocardiogram” (1910) with a description of a new method - one of the first in Russia (after A.F. Samoilov in 1908 and S.S. S. Steriopulo in 1909, and simultaneously with P. S. Usov, as well as I. V. Golovinsky and F. A. Andreev), he addressed the 3rd Congress of Russian Physicians (1911) with reports on electrical registration of the phases of cardiac activity and diagnostic significance of “action currents” of heart; published articles “Electro diagnostics of cardiac diseases” and “Electrocardiography and its clinical significance” (1913). The authors of this study emphasize, “In Russia at that time there was a wide clinical approbation of a new method of heart disease diagnostics, skeptics - opponents of the method, were much more numerous than its supporters. At this difficult stage of the method formation, VF

Zelenin was one of its pioneers, propagandists and researchers-developers (he proposed the concept of cardiogram, which was recognized worldwide). 1920s can be regarded as the second stage in the history of Russian clinical electrocardiography. In the mid-1920s VF Zelenin created one of the first electrocardiographic rooms in Soviet Russia at the Medico-Biological Institute - along with electrocardiographic rooms of M.E. Mandelstam in Petrograd, at G.F. Lang Clinic (Petrograd Institute for Advanced Medical Training); in propaedeutic, faculty and hospital therapy clinics of 1st Moscow State University (MSU); in Kislovodsk (A.Z. Chernov) etc. Valuable publications by V.F. Zelenin and his students, L.I. Fogelson, I.A. Chernogorov and others, mostly on methodological issues of electrocardiography and problems of heart rhythm disturbances, and the first national manual on electrocardiography was prepared from the Institute [1,2,10,11]. Hence, there is every reason to call V.F. Zelenin, along with A.F. Samoilov, one of the founders of electrocardiography in Russia and the USSR [1,2,10-12]. The envelope with the original stamp (Russia) and the stamp from this envelope are shown in [12,13].



**Figure 6:** Philatelic Materials Devoted to VF Zelenin

Among philatelic materials, I would like to single out numerous issues of postage stamps and first-day envelopes (FFD) of different countries, on which, with interest, one can trace the evolution of

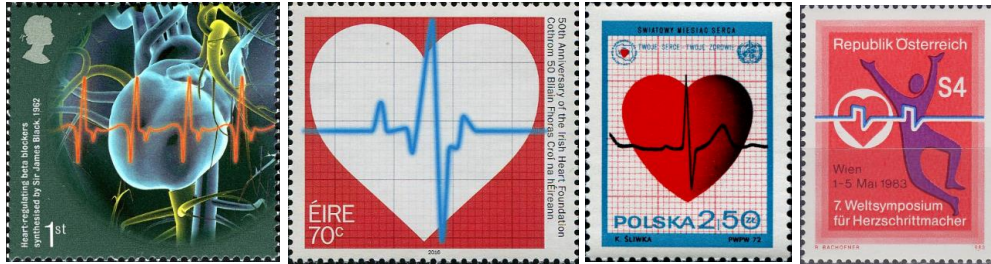
ECG examination apparatuses. One of the images of a bulky ECG machine can be seen on the Austrian postage stamp and KPD, 1972, shown in [4,5].



Figure 7: Philatelic Materials Devoted to the Evolution of ECG Machines

On postage stamps of some countries of the world, there are images of ECG behavior and electrocardiographic records themselves, connected with different subjects and episodes of medical practice, connected with application of this type of medical research [4,5].









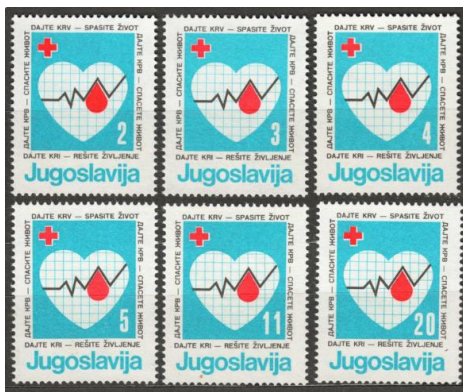
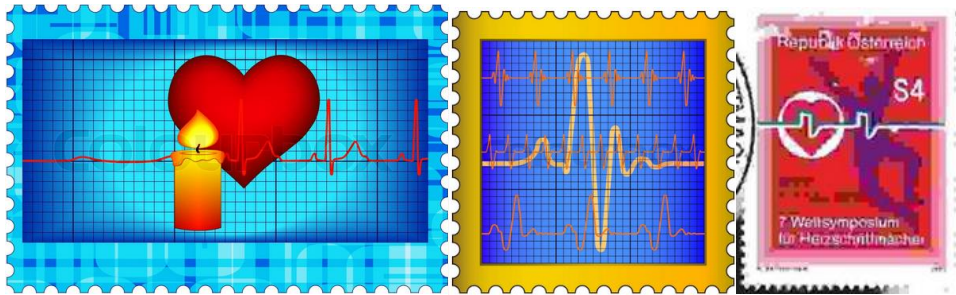




Figure 8: Postage Stamps of Some Countries of the World Devoted to ECG

As a separate exhibit, I would like to present commemorative badges and tokens, thematically related to the ECG, which are presented in [6].



Figure 9: Badges and Tokens Dedicated to ECG

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## Conclusions

1. Once again, the value and informative value of providing information on the history of medicine of the material means of culture presented through such means of collecting as philately, phaleristics, and medallion art has been clearly demonstrated.
2. Modern means of philately, in all their variety, are able to reflect and illustrate any of the sections of modern medicine and biology in a very accessible, colorful and creative way.
3. The author, in his article, has fully enough reflected the purpose of writing this article and the research he has carried out.

## References

1. Borodulin V.I. Clinical medicine from origins to the 20th century. - MOSCOW: ROIM. - 504 c.
2. A brief history of electrocardiography. 1.... - Heaco medical ... [Electronic edition].
3. Willem Einthoven EKG Electrocardiograph Abram Belskie WorthPoint sssr (date of circulation 27.01.2023).
4. Mikhel Catalogue of the Whole Things of Europe and the World / Ed. by B. Albert. Edition 8th. Without place of publication. Michel, 2013. - 1098 p.
5. Scott specialized catalogue of Worlds stamps. (2015). New York: Scott. HE6185.U5 S3 55th. – 876 p.
6. Tolmachev R.A. Catalogue of signs on medicine and biology: Congresses, congresses, conferences, symposia and other forums : Book 2 Supplement / R.A. Tolmachev, E.D. Polyakov, I.I. Tikhonyuk // . - Moscow: All-Russian Research Institute of Geosystems, 2013. - 74 p., ill.
7. Brugsch Theodor - Biographical Encyclopedia of Personality [Electronic edition].
8. Lewis, Thomas (cardiologist) - Wikipedia [Electronic edition].
9. Sir Thomas Lewis (1881-1945 [https://www. JAPI](https://www.JAPI) (date of circulation 27.01.2023).
10. Borodulin V.I. Academician V.F. Zelenin: Riddles of the Scientist's Fate and His Initiatives / V.I. Borodulin, A.V. Topolyansky, K.A. Pashkov, O.R. Parenkova, S.V. Dronova // History of Medicine. - 2014. - № 3 (3) pp. 82-92.
11. Topolyansky A.V. V. F. Zelenin - organizer and first director of the Institute of Therapy of the AMS USSR / A.V. Topolyansky, O.R. Parenikova, K.A. Pashkov // Journal of Siberian Medical Sciences. 2012
12. Postage stamps ‘ Stamps of Russia ‘ Postage stamps of 2007 [Electronic edition]. <https://filtorg.ru> ‘ (date of circulation 27.01.2023).
13. Catalog of postcards and envelopes with original stamps of the USSR 1923 -1991. Under the editorship of V.B. Zagorsky. - St. Petersburg. Standard Collection, 2002. - 64 p.

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