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NOBEL CONGRESSES IN THE FRAME OF THE INTERNATIONAL NOBEL MOVEMENT (TO THE 125TH ANNIVERSARY OF THE NOBEL PRIZES AND THE 35TH ANNIVERSARY OF THE NOBEL CONGRESSES IN TAMBOV)[1]

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Abstract. *Since April 1989 in Tambov on the basis of the International Nobel Information Center (INIC) periodic Nobel Congresses have been held, the purpose of which is to unite the efforts of scientists and specialists from various fields of activity in the analysis of the phenomenon of Nobel Prizes in the history of world civilization of the late XIX, XX and early XXI centuries. Synergetic interpretation of the phenomenon of Nobel Prizes gives a unified algorithm of renewal, strengthening, complication, and increasing the order of cultural space. Each of the thirteen Nobel Congresses made a tangible contribution to the International Nobel Movement.*

Key words*: Nobel Congresses in Tambov, International Nobel Movement, Nobel Prizes, Nobel Prize winners, nobelistics*

I. THE IDEA OF HOLDING NOBEL CONGRESSES WAS NOT BORN IN TAMBOV

For the first time the tradition of annual meetings of Nobel laureates was born in the FRG after half a century of awarding these prizes. Lindau, an ancient Bavarian town founded in the XIV century on an island and the shore of the beautiful Lake Constance, near the border of Germany, Austria and Switzerland, was chosen as the place of the meetings. The initiators of the meetings were local physicians, Dr. Franz Karl Hein and Prof. Gustav Wilhelm Parade, who attracted the idea of the representative of the Swedish royal family, Count Lennart Bernadotte, who became the president of the organizing committee of the annual meetings. In 1951, the first conference on medicine was held, which was attended by six laureates: A. Butenandt, O. Warburg, H. Dam, G. Domagk, W. Murphy and P. Müller [1]. This tradition has proved to be as enduring as the Nobel Prizes: in July 2025, the 74th Lindau meeting is already being prepared. When in 1980 I wrote the first article about the Lindau meetings unknown in the USSR [2], by that time 146 Nobel Prize winners had participated in 29 meetings, including 135

[1] The article was presented as a paper at the 13th International Nobel Congress "Science, Technology, Society and the International Nobel Movement" on October 3, 2024 (Tambov, Russia) and in a significantly expanded version was reported at a scientific seminar at the House of Scientists (Haifa, Israel) on December 16, 2024.

speakers, including six Soviet scientists participating in conferences (Fig.1-4).

I meeting in July 1951
(I Conference on Medicine)

A. Butenandt. What do we know about the biochemical aspects of heredity?
H. Dam. Medical applications of vitamin K and its biochemistry.
G. Domagk. Chemotherapy of acute bacterial infections and tuberculosis.
P.H. Müller. The problem of pest control.
W.P. Murphy. The 25th anniversary of experience in the treatment of anemia.
O. Warburg. Quantum problems of photosynthesis.

II meeting in July 1952
(I Conference on Chemistry)

K. Alder. Advances in the synthesis of organic compounds, particularly on diene synthesis and its importance in the development of selected areas of organic chemistry.
A. Butenandt. The study of insect hormones.
G. Domagk. Further development of chemical therapy of tuberculosis.
H. Euler-Chelpin. Growth agents and their antagonists.
O. Hahn. Radiochemistry and fission of uranium.
G. Hevesy. Application of radioactive tracers to the study of processes in living organism.
I. Joliot-Curie. Artificial radioactivity and development of nuclear physics.
P. Kuhn. Vitamins in milk.
F. Soddy. Isotopes.
A.I. Virtanen. Atmospheric nitrogen as a guardian of life on earth.

III meeting in July 1953
(I Conference on Physics)

P.A.M. Dirac. Quantum mechanics and the ether.
O. Hahn. Modern alchemy.
W. Heisenberg. Successes and difficulties of the quantum theory of elementary particles.
G. Hevesy. Biochemical action of ionizing radiation.
M. Laue. Interference of x-rays.
C.F. Powell. Free flight of pilot balloons at high altitudes (at least 2400 m).
F. Soddy. Discovery of the natural transformation of radioactive elements.
H. Yukawa. Experience of a unified theory of elementary particles.

Figure 1. Reports at the first three Nobel meetings in Lindau [2]

Figure 2. Nobel laureates on the island of Mainau (2003). Property of INIC

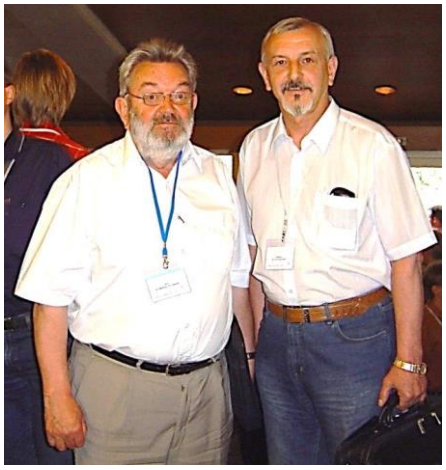


Figure 3. Author with Nobel laureate M. Veltman in Lindau (2004). Property of INIC

Figure 4. Conversation between the author and C. de Duve in Lindau (2010). Property of INIC

II. NOBEL CONGRESSES IN THE INTERIOR OF THE INTERNATIONAL NOBEL MOVEMENT

Since 1965, immigrants from Sweden have organized annual Nobel conferences in the Alfred Nobel Hall of Science at Gustavus Adolphus College in St. Peter (Minnesota, USA), which have proved to be very popular and representative, more than 60 Nobel laureates have lectured there, and on October 1-2, 2024 (just before the 13th Nobel Congress in Tambov), the 60th conference was solemnly and lavishly held, with free online access (Fig. 5) [3].

Figure 5. Alfred Nobel Hall of Science (Minnesota, USA). Open access on the Internet

The Nobel Foundation in Stockholm, the structure of which has become more complex since the late 1990s with the arrival of each new executive director (Fig. 6), has been working hard to develop the International Nobel Movement. In addition to the tradition of awarding and presenting Nobel Prizes, the following were gradually established: the Nobel Library at the Nobel Committee for Literature at the Swedish Academy (founded on November 16, 1901), which now contains more than 200,000 volumes of world fiction; in 1965, the Foundation initiated Nobel Symposia, "devoted to fields of science in which breakthroughs are being made around the world or other topics of primary cultural or social importance" [4], by now about 200 symposia have already taken place, and 7 symposia are planned for 2025; in 2001 the Nobel Museum (now the Nobel Prize

Museum) was opened on the premises of the Swedish Academy (not without intensive participation of the author), and in 2005 the Nobel Peace Center was opened in Oslo... All current initiatives of the Nobel Foundation can be seen on the official website nobelprize.org (Fig. 7) [5].

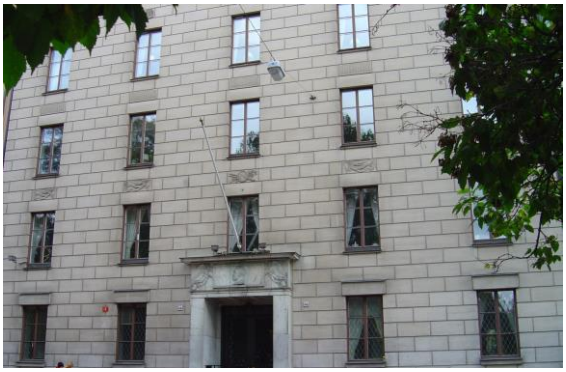


Figure 6. Nobel Foundation Building at Sturegatan, 14 in Stockholm.
Photo by the author. Property of INIC

Figure 7. Design of the new Nobel Foundation building.
Open access on the Internet

The World Summit of Nobel Peace Prize Laureates [6] was initiated by Mikhail Gorbachev as a forum where Nobel Peace Prize Laureates and Peace Prize Laureates' organizations have been meeting since 1999 in different countries to address issues of promoting and supporting peace and human well-being around the world. Its Permanent Secretariat is based in Piacenza in northern Italy. On September 18-21, 2024, the 19th Summit was held in Monterrey, Nuevo Leon, Mexico, attended by 12 Nobel Peace Prize winners. Annual Nobel conferences since 2003, dedicated to the next Nobel Prize awards, have been held in Troitsk Lyceum (Russia) with the support of the local administration, annually since 1991 Nobel conferences have been held in Ternopil (Ukraine), periodically at Alfred Nobel University in Dnipro (Ukraine), and in other locations around the world.

In the history of the International Nobel Movement there were also single interesting actions. For example, on August 18-21, 1981, a large and representative symposium "Development of science, technology and society in the time of Alfred Nobel" was held in Karlskoga (Sweden), where a huge estate and house-museum of A. Nobel is located. The Nobel Scientific Library of the INIC has a typewritten collection of the proceedings of this symposium [7]. Similar forums were held around the world many times, but until the early 1990s no one was professionally engaged in the formation and research of all the directions of the International Nobel Movement, especially no individual researchers of some of its components were united.

In such a situation, the author to form an idea of the International Nobel Movement, to organize a systematic study of its directions, to unite the efforts of Nobel researchers, to call them *nobelists*, and the new scientific direction as *nobelistics*, the results of which are periodically discussed at meetings-conferences of Nobel Prize winners and nobelists, which gradually developed into Nobel Congresses. The original purpose of such forums was to unite disparate nobelists, each of whom developed a separate subject (Nobel motifs in philately, fiction, biographies of laureates…), into a single community, which is engaged in popularizing knowledge about the Nobel family and Nobel Prize winners. Such information was catastrophically lacking in Soviet times. When this goal was achieved and the number of names from all over the world in our database of nobelists exceeded 500, another goal was set: to conduct permanent scientific research in all areas of nobelistics, to restore the complete genealogy of the Nobel family and to study the lives and activities of all

Nobel laureates, especially based on their works, trends in the development of natural sciences, literature, politics and economics.

These goals required a serious scientific and educational information foundation. Hence the need to collect information on тobelistics not only in individual private collections, but to establish an official organization. Thus, under the leadership of the author, the scientific and technical cooperative "Informatician" (1987) appeared, which grew in 1988 into the International Nobel Information Center (INIC) with its Nobel Scientific Library, the Museum and Archive of the Nobel Family and Nobel Prize Laureates, databases on nobelistics, the international publishing house "Nobelistics" and periodic Nobel Congresses.

1.The first meeting-conference of nobelists

The first meeting-conference of nobelists on April 15-16, 1989 was actually an extended meeting of the club "Life of remarkable people" (Fig. 8), which worked at the library faculty of the Tambov branch of the Moscow State Institute of Culture. This meeting turned out to be significant: 19 scientists and specialists (Fig. 9 and 10) from Moscow, Leningrad, Samara, Kirovsk, Mendeleevo, Vilnius, Riga, Tallinn, Kiev, Ternopil, Uzhgorod, Zaporozhye, and Svetlovodsk (USSR), Marseille (France), Jerusalem (Israel) and Munich (Germany) came among the hundred invited. The filming was conducted by a group from central television, accompanied by a Moscow correspondent (Fig. 10).

At this meeting all the speeches were, in fact, stories about what each participant does in the field of nobelistics, what collections he possesses and how he plans to develop nobelistics in the future. However, we gradually managed to turn the meeting into a discussion about Nobel Prizes, Nobel laureates, to discus the proposal to officially register the International Nobel Information Center in Tambov and to continue the meetings-conferences in the future. Such a phenomenon in the Soviet Union was so unexpected and unusual (we remember that until the early 1990s even the mention of Nobels and Nobel Prizes was perceived negatively) that many foreigners refrained from coming, but sent their greetings: Executive Director of the Nobel Foundation Stig Ramel (1927-2006), directors of Nobel firms, Nobel Prize winners Alexander Mikhailovich Prokhorov (USSR), Glenn Seaborg, Roald Hoffmann and Herbert Brown (USA), and other foreign scientists (Fig. 11).

Friendly relations were subsequently established with all those who responded: G. Seaborg sent many unique materials on the American nuclear project, H. Brown and two-time Nobel laureate F. Sanger were awarded diplomas and INIC Gold Nobel medals, and S. Ramel organized a long internship for the author of this article at the Nobel Foundation in Stockholm in October 1991.

Figure 8. Poster for the First Nobel meeting-conference (1989). Property of INIC

Strictly speaking, this was not the first conference held by the author of this article. Since 1983, three constantly enlarging conferences with the publication of reports have been held within the framework of the Tambov branch of the Moscow State Institute of Culture: the 1st Regional Scientific Conference "Informatics and Technical Means" (May 11-14, 1983) [8], the 2nd

regional scientific conference "Informatics and Science of Science" to the 350th anniversary of Tambov (May 27-28, 1986) [9, 10], the 1st All-Union scientific conference "Informatics and Science of Science" (June 1-4, 1988), which for the first time included materials on nobelistics [11]. These conferences from 1968 to 1988 were preceded by intensive research on Nobel topics, the results of which are reflected in more than a hundred publications [see, for example: 12-24].

Figure 9. Fragment from a TV movie about the First Nobel meeting-conference (1989). Property of INIC

Figure 10. Famous historian of science J.W. Hurwitz (France) at the First Meeting-Conference (1989). Property of INIC

It was at the first meeting-conference that the idea of creating an International Nobel Information Center was first publicly proposed. Although this idea, as well as the terms "nobelistics" and "nobelists" themselves, were not widely supported and understood at that moment, the beginning was made. The achievements of the nascent Tambov nobelistics were publicized and became known to the scientific community. "The spring of 1989 clearly showed that Tambov had done a tremendous job of collecting and systematizing information related to the Nobel theme, and that the prospects of activity in this direction were very broad. The results of this work received a serious response abroad in the form of scientific publications, in which the term "nobelistics" began to sound more and more often. Characteristically, this term "took root" much faster abroad than in Russia. Eventually, the number of works on this problem exceeded a certain critical mass, which objectively demanded their separation into a separate scientific direction. Already in 1990 the international commission allocated in the UDC (Universal Decimal Classification) system a special department with the index 06.068 "Nobel and Nobel Prizes. Nobelistics". The term was officially legalized" [25].

Figure 11. Participants of the First Meeting Conference in Tambov (1989) on an excursion in the town of Rasskazovo. Property of INIC

2. The next milestone in the INIC

The next milestone in the INIC history was 1991, which was a turning point for Russia. In August, a printed fragment of the international database "Nobelists" was published, and on **September 10-15, Tambov hosted simultaneously the "Second International meeting-conference of Nobel Prize laureates and nobelists"** and the 2nd All-Union Scientific Conference "Informatics and Science of Science" [26, 27]. The

organizers are INIC, the Tambov branch of the International Foundation for the History of Science, and the Tambov State Institute of Culture (Fig. 12).

Figure 12. Poster for the Second meeting conference (1989). Property of INIC

More than 500 people were invited to the meeting, including 50 foreign laureates and nobelists. The founding issue of the newspaper "Bulletin of the INIC" was presented at the conference [28], the Nobel Scientific Library was inaugurated (Fig. 13), the funds of which represented books and brochures of Nobel laureates and literature about them collected by the author of this article over 30 years. On September 13, 1991, the Museum of Alfred Nobel and Nobel Laureates was opened (Fig. 14). By this date was made and presented to the museum a bust of the famous Swedish scientist A. Nobel by Tambov sculptor K.Ya. Malofeev. Until now the bust decorates our museum (fig.15).

The final session on September 14 included the presentation of the book by E.B. Baliutavičiutė and V.M. Tyutyunnik "Nobel Prize Laureates in Literature 1901-1990: a biographical guide" [29], which was another contribution to the development of Nobel Studies. [29], which became another contribution to the development of nobelistics, the biographical book "Informaticians and Scientific od Science Researchers" by O.I. Voverene and V.M. Tyutyunnik, and the second edition of the bio-bibliography "Alfred Nobel and Nobel Prizes" (Fig. 16) [30], as well as the first issue of the "Bulletin of INIC" [31].

Figure 13. At the opening of the Nobel Scientific Library (September 12, 1991) at the Tambov branch of the MSIC. Property of INIC

Figure 14. First exhibit of the Museum of Alfred Nobel and Nobel Prize Laureates (September 13, 1991). Property of INIC

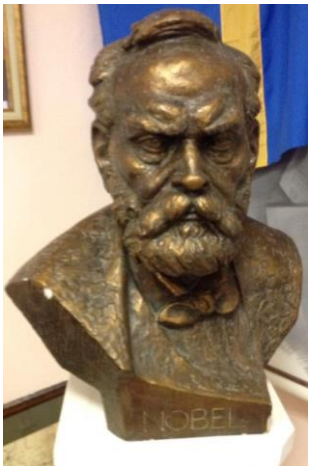


Figure 15. Bust of A. Nobel in the Museum of Alfred Nobel and Nobel Prize Laureates. Property of INIC

The second meeting-conference on nobelistics clearly showed that the 1989 endeavor turned out to be not only viable, but really demanded and having the broadest prospects (Fig. 17). In fact, the INIC was already established and active, despite the fact that its headquarters was located in the Russian countryside, from which it was difficult to expect phenomena of such importance and scale. Afterward, one often heard: "Why not in Moscow?". However, to further expand its activities, it was necessary to make the organization an independent legal entity. This happened in 1992. By Order No. 1 of October 13, the scientific and technical cooperative "Informatician" was transformed into the International Nobel Information Center.

Figure 16. Some books published at INIC prior to 1991. Property of INIC

Figure 17. Participants of the Second meeting-conference on nobelistics and the 2nd All-Union scientific conference "Informatics and Science of Science" in Tambov (1991) during the discussion on the state of the world scientific documentary flows. From left to right: Prof. A. Pombeiro (Portugal), G.V. Vishnyakova (INION), Prof. Z.V. Todres (USA), V.M. Tyutyunnik, A.N. Krivomazov (IHNST), V.M. Vozchikov(Central Television), T.A. Soboleva (translator, now in the USA). Property of INIC

Inspired by the results of two Nobel conferences, the talented Tambov poet Victor Golovashin, at the request of the author of this article, has written a series of seven satirical poems about Russian Nobel laureates (Fig. 18 and 19). The first of them is dedicated to I.A. Bunin (Fig. 18; winner of the Nobel Prize for Literature in 1933, who had been in exile in France since 1920):

Старичок у камина. За окном чернота.
Вспоминаются дни окаянные.
Год семнадцатый – роковая черта.
Убиенные… Первозванные.

Жизнь хрустела антоновским яблоком.
Были в ней и горенье, и тление.
А остался от прошлого пепла ком.
Вот такая судьба Арсеньева.

«Не забыть бы к завтраму спич…»
Засинел в переплёте квадрат.
Засыпает Иван Алексеевич.
Бунин… Нобелевский лауреат.

Figure 18. I.A. Bunin.
Open access on the Internet
V. Golovashin (1991)

I.P. Pavlov A.D. Sakharov B.L. Pasternak M.A. Sholokhov A.I. Solzhenitsyn M.S. Gorbachev

Figure 19. Russian Nobel laureates whose poems are dedicated by V. Golovashin/ Open access on the Internet

3. The III International Meeting-Conference on nobelistics

The III International Meeting-Conference on nobelistics, dedicated to the 90th anniversary of chromatography (Fig. 20)**, was held on September 21-24, 1993** (150 Russian and foreign scientists were present) [32]. The work was organized in four sections: 1) A.Nobel: life and activity. Nobel family; 2) Nobel prizes: scientific and scientific problems; 3) Nobel Prize winners: life and activity; 4) Chromatography: modern problems and history. The results, as before, were productive. In the report of the founder of the INIC for the first time the purpose, tasks, main directions and principles of work of this organization as a subject of science and information market were voiced. Since the main problem of nobelistics at that time was the lack of information, the goal of INIC was proclaimed the creation of a new automated library-museum-archival-information technology on nobelistics, concentrating in a single center information about A. Nobel, his institutions and activities of Nobel Prize winners, creating conditions for international use of this information.

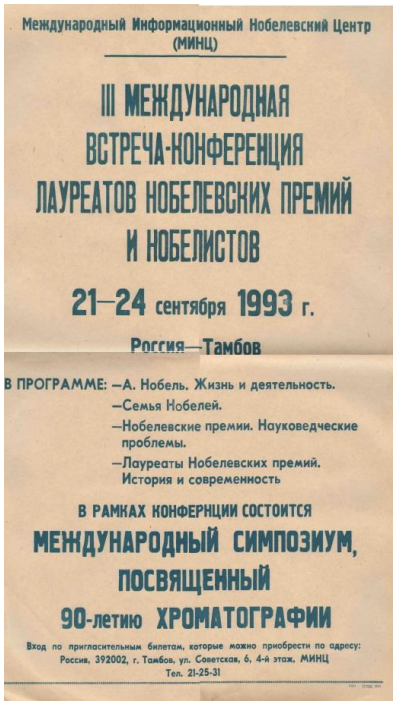


Figure 20. Poster for the III meeting-conference (1993). Property of INI*C*

For this purpose, the Centre should continue to organize and hold international conferences on nobelistics in Tambov, create and regularly update the international database "A. Nobel and Nobel Prizes. Nobel Prize winners in physics, chemistry, physiology or medicine, literature, peace, economics", as well as the database 'Nobelists', enrich the collections of the "Nobel Scientific Library", "Museum and Archive of the Nobel Family and Nobel Prize Winners" (Fig. 20), form the INIC publishing house and publish books on Nobel topics.

December 1993 was marked by a new trip to Stockholm and participation in the Nobel Week: awarding of Nobel Prizes in the Philharmonic Concert Hall, Nobel lectures at Stockholm University and at the Swedish Academy, discussions with the laureates, visits to Nobel firms (Fig. 21).

ДЕЛО АЛЬФРЕДА НОБЕЛЯ ПРОДОЛЖАЕТСЯ

По всему миру и, в частности, в Тамбове

— Случай! Совершеннейший случай!..

Именно так четыре с половиной года назад начинал объяснять мне свой интерес к нобелевским проблемам Вячеслав Михайлович Тютюнник, заведующий кафедрой библиотековедения и информатики Тамбовского института культуры. Ему было 16 лет, когда, листая журнал "Химия и жизнь", он наткнулся на подборку материалов о нобелевских лауреатах по химии. Заинтересовался. Пожалел, что знает о них ничтожно мало. И задался суперидеей: завязать переписку с самими нобелевскими лауреатами.

Юношеская утопия? Но вот Тютюнику ответил один лауреат, за ним — второй, третий... За четверть века Вячеслав Михайлович собрал уникальный "нобелевский" архив. Чьих только автографов у него нет! Австриец Фриц Прегль, американцы Глен Теодор Сиборг (руководитель Комиссии по ядерной энергетике США) и Герберт Браун (химик), личный фотограф Альберта Эйнштейна Лотта Якоби — они, как и многие другие, в разные времена писали Тютюннику, исправно (интеллигентные люди!) отвечая на его запросы. Особая переписка — с Нобелевским комитетом в Стокгольме: с его сотрудниками у Вячеслава Михайловича налажены постоянные контакты.

А внутри страны Тютюнник искал единомышленников: энтузиастов, увлеченных нобелевской тематикой не меньше, чем он сам. Он нашел их в Ленинграде и Риге, Вильнюсе и Запорожье, Москве, Кировске, Ужгороде, Самаре, Владимире, Абакане... Одни интересовались нобелевскими лауреатами в области литературы, другие — в области естественных наук, кто-то собирал библиографические сведения о самом Альфреде Нобеле, кто-то — коллекцию марок по данной теме. Короче, "клуб по интересам" складывался вполне приличный. Тютюнник назвал новых коллег нобелистами и в апреле 1989 года пригласил их в родной Тамбов на первую международную встречу, посвященную Альфреду Нобелю, нобелевским премиям и их лауреатам.

...Были приятные знакомства, вечер при свечах, выездная "сессия" нобелистов. Договорились: через два года собираемся снова. А за это время предстояло создать в Тамбове полноценный Международный информационный нобелевский центр, международный банк данных и знаний "Альфред Нобель и лауреаты нобелевских премий", хозрасчетную нобелевскую библиотеку, музей А.Нобеля и нобелевских лауреатов.

Все, что намечалось, сделали. Встретились в сентябре 91-го, когда страну еще трясло от последствий августовских событий. Мог ли тогда кто-нибудь предположить, что третья конференция состоится как раз накануне октябрьского путча образца 1993 года! Но произошло именно то, что произошло: в дни проведения третьей встречи, в конце нынешнего сентября, по Тамбову маршировали "красные пенсионеры"...

Политическая нервотрепка на ходе конференции, к счастью, не отразилась. Впрочем, и не могла отразиться: слишком разные задачи у тех, кто привык драть глотку на площади, и тех, кому дорого наследие Альфреда Нобеля, кто по крупицам собирает сведения о его жизни и жизни нобелевских лауреатов. Весовые категории, простите, не совпадают!

...Любая история имеет свою предысторию. Не составь Альфред Нобель в 1895 году своего знаменитого завещания — вряд ли человечество отыскало бы в XX веке иной способ выявления гениев от науки, литературы, экономики. А Нобелевская премия — индикатор уникальный, проверенный временем: она, самая престижная и желанная, традиционно отбирает достойнейших из достойных. Ошибок на этом поприще не было.

...вот несправедливости с российскими советскими претендентами на премию были. Правда, винить, кроме самих себя, некого. Может кто-нибудь вразумительно ответить: адекватен ли текст "Доктора Живаго" той бешеной травле, которой подвергли Бориса Пастернака? Что антисоветского усмотрели в нем блюстители соцреализма? Похоже, двигала ими примитивная зависть: ему дали — а мы чем хуже! Вот и набросились... Кстати, процитируем строчку из стихотворения Галича, посвященного памяти Пастернака: "Мы поименно вспомним тех, кто поднял руку!". Процитируем — и "вспомним тех, кто поднял руку" на позорном заседании писателей в московском Доме кино, где Пастернака обвинили во всех мыслимых и немыслимых грехах: Тихонов, Марков, Катаев, Гулиа, Прокофьев, Грибачев, Полевой, Яшин, Шипачев, Ошанин, Михалков (а как же без Михалкова!). Выступая на нобелевской конференции с великолепным докладом о творчестве Пастернака, Евгений Николаевич Шталь (он работает в центральной библиотеке города Кировска) прочитал вирши Михалкова, опубликованные 29 октября 1958 года в "Комсомольской правде" (кто не верит — найдите газету и убедитесь сами). Шедевр подхалимажа:

Антисоветскую заморскую отраву
Варил на кухне наш заклятый враг.
По новому рецепту, как приправу,
Был поваром предложен пастернак.

Весь наш народ плюет на это блюдо:
Уже по запаху мы знаем, что откуда!

Хотелось бы дожить до того времени, когда "весь наш народ", окончательно освободившись от навязанных ему за 74 года догм, навсегда расплюется с подобными баснописцами...

Но вернемся к личностям более достойным. Альфред Нобель: уникальная личность, в высшей степени творческая и многогранная. Правда, В.Тютюнник познакомил собравшихся с малоизвестным фактом — по сути, сенсационным.

— У меня есть копия статьи из газеты "Вашингтон пост" начала 50-х годов, — рассказывал Вячеслав Михайлович. — В ней упомянуто, что среди изобретений Альфреда Нобеля значится... электрический стул! Кстати, такая конструкция вполне согласуется с техническими наклонностями Нобеля. Я написал в "Вашингтон пост" и попросил найти хоть какие-нибудь сведения об авторе заметки. Мне ответили, что такими сведениями редакция не располагает.

Что это — "утка", заведомая дезинформация? Ошибка? Я видел многие патенты, выданные в разное время Нобелю: электрического стула среди них нет. Но ведь и дыма без огня не бывает...

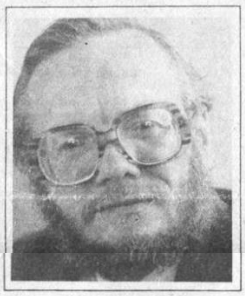
Тут среди нобелистов разгорелся спор на вечную тему: прав ли был Пушкин, вкладывая в уста Моцарта знаменитую фразу — "Гений и злодейство не совместны!". Вспомнили о других изобретениях Нобеля, нашедших применение в военных сферах, об участии Альберта Эйнштейна в создании атомной бомбы, Андрея Дмитриевича Сахарова — в создании бомбы водородной... Сошлись в конце концов на том, что гений (в том числе и потенциальный нобелевский лауреат), реализуя себя, старается прежде всего совершить прорыв в науке, сказать в ней принципиально новое слово. А то, что человечество направляет результаты их труда в антигуманное русло, является нашей общей бедой, следствием нашего несовершенства, преобладания (во многих случаях) злых помыслов над добрыми. Выходит, мы недостойны гениев, вышедших из нашей же среды? Выходит, что так.

Минорные размышления и легкое (вполне справедливое!) самобичевание отнюдь не расслабило нобелистов. Напротив, планы у них грандиозные. Намечается выпуск ежегодного сборника трудов Международного информационного нобелевского центра, объем которого ограничивать никто не собирается: сколько появится достойных материалов, столько и будет опубликовано. Предусмотрена серия почетных дипломов, денежных премий нобелистам, чей научный вклад окажется наиболее весомым. К тому же солидная денежная премия ждет тех, кто заранее предскажет будущего лауреата Нобелевской премии, — здесь, правда, предстоит оговорить четкие правила конкурса во избежание "плагиата" и взаимных претензий. Кстати, на первой конференции кто-то предугадал вручение премии мира М.Горбачеву, но кто — попробуй, вспомни!

...В 1995 году научная общественность будет отмечать 100-летие эпохального завещания Альфреда Нобеля. Тогда же предполагается провести очередную встречу нобелистов.

Четвертую по счету.

Александр РУВИНСКИЙ,
научный обозреватель "ВЭ"



КАК СЕМЬЯ НОБЕЛЕЙ ПОМОГАЛА РОССИИ

Виктор МЕШКУНОВ [Санкт-Петербург],
член Международного информационного нобелевского центра

Недавно нам впервые показали американский сериал телевизионных фильмов "Нобелевское столетие. Хроника духа". Но удивительно — в первом фильме "Динамитное наследие", повествующем о жизни Альфреда Нобеля, не было ни слова о нашей стране. А ведь именно здесь он получил первое образование, познакомился с работами русских ученых Н.Н.Зинина и В.Ф.Петрушевского, на средства своего отца, Эммануила Нобеля, смог совершить заграничное путешествие по Европе и Америке.

Что же это были за средства? Приглашенный русским правительством, Эммануил Нобель организовал в Петербурге сначала мастерскую, а затем совместно с генералом Огаревым механический завод, ставший позднее собственностью Нобеля. Велико было значение этого завода для оборонной промышленности страны: на его счету — крупные механические работы по переоснащению Кронштадтской крепости, обустройство Нового Арсенала в Петербурге и строительство (впервые в России на частном заводе) силовых установок для военных кораблей "Тангут", "Ретвизан" и "Вола".

Во время Крымской войны 1853—1856 гг. Э.Нобель вместе со своим сыном Робертом ставил подводные мины ударного действия собственного изобретения на подступах к Кронштадту. Деятельность Э.Нобеля была отмечена по достоинству: он заслужил орден Св.Станислава 2-й степени. Но после окончания Крымской войны его завод, почти полностью ориентированный на военную продукцию, оказался на грани банкротства. Эммануил Нобель в 1859 году вернулся в Швецию вместе со своей семьей. С ним уехал и Альфред Нобель.

Но дело, начатое Э.Нобелем, не погибло. Его сын Людвиг, оставшийся в России, основал механический завод "Людвиг Нобель" (ныне завод "Русский дизель") в Петербурге. На нем впервые в России освоили производство дизельных двигателей для судов как торгового и танкерного флота, так и для военных кораблей и даже подводных лодок. С деятельностью Л.Нобеля связано переоружение русской армии: его завод стал основной технической и инженерной базой для переустройства казенного Ижевского оружейного завода. За это Людвиг Нобель получил орден Св.Анны 2-й степени.

С 1876 года новым направлением деятельности семьи Нобелей в России стала нефтяная промышленность. Так появилась крупнейшая в империи фирма "Товарищество нефтяного производства братьев Нобель", одним из учредителей которой был и Альфред Нобель. На новом поприще Людвигу Нобелю удалось впервые в России построить нефтепроводы, создать нефтеналивной флот, организовать систему хранения и транспортировки нефтепродуктов с помощью металлических резервуаров и железнодорожных цистерн.

Людвиг Нобель большое внимание уделял рабочим своих предприятий, постоянно повышая им заработную плату и улучшая условия их труда. Он писал о необходимости отмены крепостного права, анализировал состояние российской промышленности, подчеркивая отсутствие условий для развития национальных рабочих кадров. Людвиг Нобель считал, что никакие иностранные специалисты не в состоянии поднять русскую промышленность, а нужно рассчитывать только на свои силы. Поэтому он много средств выделял на различные школы, училища и премиальные фонды. Так, по уставу "Товарищества нефтяного производства братьев Нобель" 40% прибыли отчислялось на поощрение служащих и рабочих фирмы.

Интенсивная, яркая жизнь Людвига Нобеля оборвалась в 1888 г. в Каннах, но похоронили его в Петербурге на Смоленском лютеранском кладбище. А год спустя при Русском техническом обществе были учреждены премия и золотая медаль его памяти.

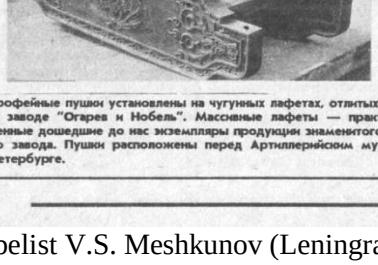
Дело Л.Нобеля успешно продолжили его сыновья Карл и Эммануил. Именно Карлу наша аграрная страна была обязана активным внедрением сепараторов шведского изобретателя Лаваля, для чего было создано предприятие "Товарищество Альфа-Нобель". После смерти К.Нобеля в 1893 году все дела фирмы оказались сосредоточены в руках Эммануила Людвиговича, которому удалось не только довести начинания отца до высокого уровня, но и выдержать конкуренцию с американским концерном "Стандарт Ойл" и выйти на мировой рынок. Эммануил Нобель занял ведущее место и в финансовых кругах России, став членом правления ряда акционерных обществ и банков.

По отношению к рабочим он продолжал традиции своего отца. При высоком уровне заработной платы более 90% рабочих имели "квартиры и казармы, отвечающие современным требованиям, и лишь остальные 10% получали взаймы квартирные деньги". Э.Нобель создавал школы и библиотеки в Баку, содержал школу в Петербурге, где устроил так называемый Народный дом, в котором бесплатно размещались профессиональные рабочие организации. Известны его пожертвования Дому призрения и ремесленного образования бедных детей, устройство бесплатных дешевых народных столовых, строительство комплекса зданий для служащих и рабочих в Петербурге. Значителен вклад Э.Нобеля и в развитие отечественной медицины — являясь членом-сотрудником Института экспериментальной медицины, он пожертвовал на его нужды 5 тысяч рублей, оказывал помощь в снаряжении санитарных экспедиций во время холерных эпидемий начала XX века. Не оставил без внимания Э.Нобель и точные науки: на его средства были построены три сейсмические станции в Баку и Красноводске.

Заслуги Эммануила Нобеля перед Россией были отмечены орденами Св.Анны 3-й и 2-й степеней, Св.Станислава 2-й степени и Св.Владимира 4-й степени. Кроме того, ему был пожалован чин действительного статского советника за "пожертвования на пользу науки и народного образования".

Активную благотворительную деятельность вела и дочь Людвига Нобеля, Марта Людвиговна Нобель-Олейникова, врач и рентгенолог, окончившая Петербургский Женский медицинский институт. С ее помощью в этом институте были построены Глазная и Факультетская хирургическая клиники.

В 1917 году деятельность семьи Нобелей в нашей стране была прервана — они покинули свою вторую родину, которую при иных обстоятельствах не оставили бы никогда. Но история этой шведской семьи наглядно демонстрирует нам существовавший в России опыт разумного привлечения иностранцев для развития промышленности, науки и культуры. Опыт, который именно сегодня требует пристального изучения.



Эти трофейные пушки установлены на чугунных лафетах, отлитых в 1850 году на заводе "Огарев и Нобель". Массивные лафеты — практически единственные дошедшие до нас экземпляры продукции знаменитого нобелевского завода. Пушки расположены перед Артиллерийским музеем в Санкт-Петербурге.

"ВОСТОЧНЫЙ ЭКСПРЕСС" № 33, 34, 1993 г.

Figure 20. Articles by journalist A.Yu. Ruvinsky (Moscow) and nobelist V.S. Meshkunov (Leningrad), published after the III meeting-conference in Tambov (1993). Both authors participated many times in Tambov conferences. Property of INIC

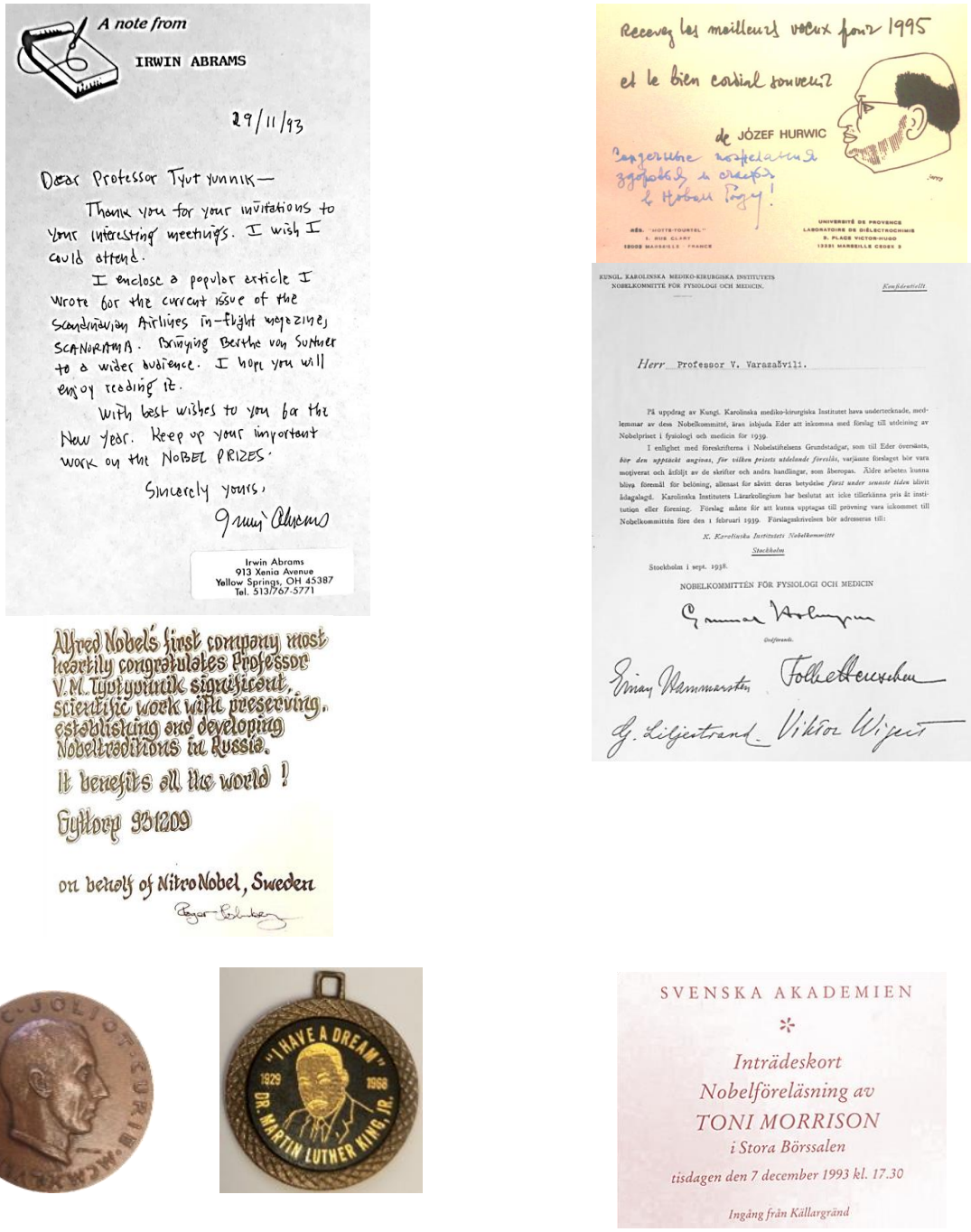


Figure 21. Some of the many materials that have come to the IINC Library, Museum and Archives after conferences and travels. 1993. Property of INIC

4. The IV International meeting-conference of Nobel Prize laureates

In November 1994, we held the next 3rd International Scientific Conference "Informatics and Science of Science", which became the 5th Tambov one and which included materials on nobelistics [33]. **The IV International meeting-conference of Nobel Prize laureates and nobelists was planned for November 26-30, 1995**, for which the first extensive program of international research on nobelistics was prepared [34]. It was to be attended by 350 people, including about 100 Russian and foreign scientists, employees of the Nobel Foundation and Nobel Committees in Stockholm and Oslo, representatives of the Swedish and Norwegian embassies. It was planned to solemnly present the awards established in June to 52 participants (Fig. 22). However, the turbulent

1990s allowed the event to be held only in absentia [35], and the first official award for 1995 to the six nobelists came three years later.

Figure 22. INIC Gold Nobel Medal (left) made by the Director of the INIC branch in Bishkek, Prof. R. Rakhmanaliev in 1995 and delivered to Tambov; INIC postmark (1996), made in advance 5 years before the 100th anniversary. Property of the INIC

5. The V meeting-conference of nobelists

In December 1996, the 4th International extramural scientific conference "Informatics and Science of Science" with inclusion of materials on nobelistics was organized, and in **November 1998, the V meeting-conference of nobelists was held** [36]. The meeting was held according to the already established scheme, within its framework the 5th International Conference "Informatics and Science of Science" (the seventh Tambov one) was held.

In 1999, the Center had to change its location. "The harsh realities of the present time were such that ... the INIC, having barely had time to hastily pack the most unique documents and exhibits, was literally thrown out on the street. It was not only a moral (for the management and staff), but also an organizational blow, the well-functioning work was slowed down, besides, the VI meeting-conference on nobelistics was planned for October of that year, which was again held in absentia, the works of which could be published only two years later [37, 38]. The President of the INIC addressed a large letter to the international scientific community, in which he described what had happened and asked for support. During the year, several calls followed from Denmark, Norway, Poland, Sweden, and Japan with offers to move the INIC to them.

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However, the situation changed quickly, and it was possible to resume, register and manage the previously closed Tambov branch of the Moscow State University of Culture and Arts, to the territory of which the INIC moved, later changing its form of ownership.

INIC entered the XXI century as a mature, well-structured and well-established organization. A rich experience of research and conferences has been accumulated; dozens of stable contacts have been established both in the country and abroad. The results of 10 years of work: 20 databases on nobelistics with the original management system, containing gigabytes of information, unique materials in museum and archive funds, hundreds of publications on various aspects of the chosen scientific direction.

7. The VII International Meeting-Conference

In October 2001, the last of the series "Informatics and Science of Science", the 6th international (8th Tambov) conference with inclusion of materials on nobelistics was held. But the next landmark year for the Center was 2002: on **May 20-25 the VII International**

Meeting-Conference was held, which for the first time was named as the International Congress "Science, Technology, Society and Nobel Movement in the Third Millennium", dedicated to the 100th anniversary of the Nobel Prizes (Fig. 23) [39, 40]. The meetings were held for the first time in Moscow and Tambov, and several significant events took place within the framework of the meeting: diplomas and MINC gold medals were awarded to Nobel Prize laureates in chemistry H. Brown and F. Sanger. All papers were published in four volumes of the INIC Proceedings [37-40], several books and brochures on nobelistics were presented, including the almanac of the International Nobel Movement "Nobelistics" (Fig. 24), published by the international publishing house of the INIC (license 1997), in which the President of the INIC for the first time described the Nobel Prizes as a phenomenon of world culture (Fig.25), the web-site of the INIC, which was under development, was presented (Fig.26).

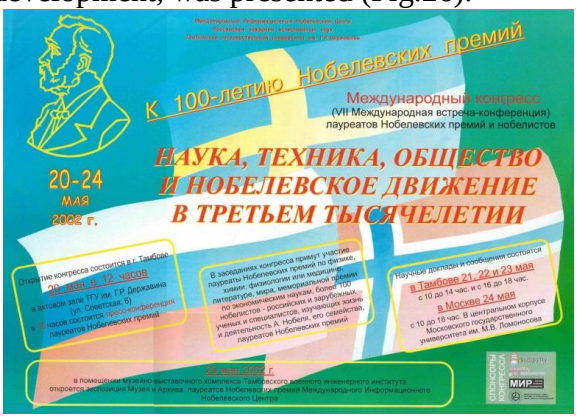


Figure 23. Poster for the VII meeting conference (2002). Property of INIC

Figure 24. Almanac of the International Nobel Movement. "Nobelistics" No. 1 (2002). Property of INIC

8. The VIII International meeting-conference

Only five years later, in **September 2007, the VIII International meeting-conference** [41] was held in absentia, which gathered the world color of nobelistics and set new tasks for domestic and foreign nobelists. By this time, the INIC had already five branches, including Baku, Bishkek and Vienna; the library, museum and archive were significantly enriched and moved to new specially equipped premises.

Figure 25. Fragments of the VII Nobel Congress (2002). Property of INIC

9. On September 27-29, 2010 in Tambov the IX meeting-conference of nobelists "Science, Technology, Society and the Nobel Movement" took place, which gathered 32 representatives from 15 cities of 6 countries: Russia, Ukraine, Germany, France, Canada and the USA [42]. By this time, the first stage of research of Russian archives was completed and a fundamental work on the history of the Nobel family and Nobel Prizes was published [43], 2 doctoral and 6 candidate dissertations on nobelistics on the materials of INIC were defended, domestic and foreign nobelists were actively working (E. B. Gvinieva, I.A. Dyakonova, I.G. Fuchs, A.A. Matveychuk, V.S. Meshkunov, A.I. Melua, F.P. Kesamanly, V.S. Lobankov, A.M. Blokh, A.M. Ilyukovich, E.N. Stahl, I.A. Lalayants, V.A. Kritzman, I. Hargittai, I. Abrams, K. Fant, A. Neubauer, J. Kauffman, etc.). [44].

Each Nobel Congress gave birth to new ideas, projects, and publications (Fig. 22-25). In parallel, the annual conferences "Formation of a specialist in the conditions of the region" were held, the collection of scientific papers "Information processes and systems" was published, which grew into the scientific journal "Information processes, systems and technologies", the growing funds of the INIC required numerous descriptions and catalogs, the staff grew, the project "On Nobel places of Russia and Europe" began to be realized (Fig. 27-31)... By the opening of the conference, the INIC international publishing house "Nobelistics" published Alfred Nobel's only tragedy "Nemesis" for the first time in Russian (with a parallel text in Esperanto).

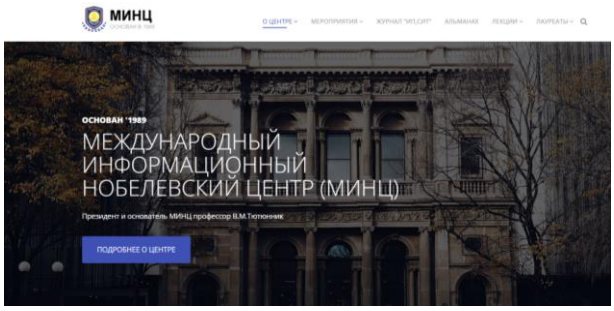


Figure 26. Fragment of the INIC website: http://www.nobel-centre.com/ru

Figure 27. Four laureates at a meeting with children of Yamal in St. Petersburg, 22.09.2009. From left to right: Turing Prize winner John Hopcroft, Nobel Prize winner in Physics Ivar Giaever, Nobel Prize winner in Chemistry Richard Ernst, Nobel Prize winner in Physics Alan Heeger. Property of INIC

Figure 28. Director of the INIC branch in St. Petersburg V.I. Ishchuk reports the results of his research at the INIC Museum (2010). INIC property

Figure 29. Prof. L.G. Semenova, wife of Nobel results laureate N.N. Semenov, with V.M. Tyutyunnik in the memorial recreation room at the N.N. Semenov Institute of Chemical Physics, RAS (2004). INIC property

Figure 30. INIC's Nobel Research Library. Property of INIC

Figure 31. Figure 31. Fragment of the Museum of the Nobel Family and Nobel Prize Winners. Property of INIC

10. The Tenth (jubilee) Congress

The three Nobel Congresses of the 2010s took place at the height of the activities of the INIC and its subdivisions. **The Tenth (jubilee) Congress "Science, Technology, Society and the Nobel Movement" took place on October 23-27, 2013** (Fig. 32), first in Moscow after the meeting of foreign guests, then in Tambov, in the regional museum of local lore, in the Memorial Museum of the Tambov region, in the Museum and Library of the INIC. It was not only a triumph of scientific ideas of nobelistics, celebration of the 180th anniversary of Alfred Nobel's birth, but also a joy of communication with many outstanding personalities: academician of RAS Yu.V. Gulyaev (Moscow), the first cryosurgeon of the world N.N. Korpan (Vienna), rector of RosNU V.A. Zernov (Moscow), Ludwig Nobel's great-grandson Michael Nobel (Stockholm), N.N. Semenov's wife L.G. Semenova (Moscow), P.A. Cherenkov's daughter E.P. Cherenkova, L.V. Kantorovich's son V.L. Kantorovich, the famous gastroenterologist Y.A. Filippov (Dnepropetrovsk) and others. In addition to the traditional Proceedings of the Congress [45], several books on nobelistics (by J. Watson, J.K. Maxwell, A.S. Levchenko, V.I. Ischuk, V.S. Meshkunov, P. Ahanchi, A.N. Krasilnikov), as well as related symbolism (envelope, Fig. 33, stamp, badge, seal, etc.) were published.

The gold medal and diploma of INIC were awarded to M. Nobel (03.02.1940-27.11.2024), N.N. Korpan and V.A. Zernov (Fig. 34).

Figure 32. Poster for the 10th Nobel Congress (2013). Property

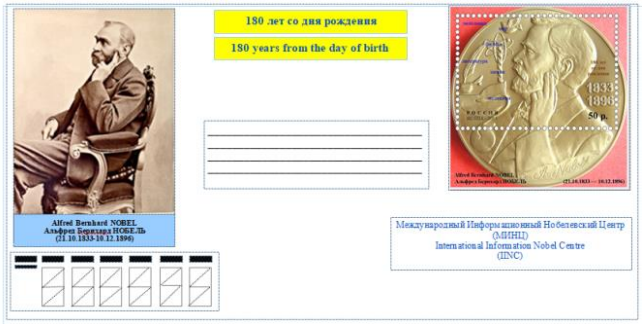


Figure 33. Envelope with stamp for the 10th Nobel Congress (2013). Property of INIC

11. 11 Nobel Congress "Science, Technology, Society and the International Nobel Movement"

11 Nobel Congress "Science, Technology, Society and the International Nobel Movement" (October 24-27, 2017) [46] was even more representative and solemn: the opening was held in the oldest in Russia Tambov Drama Theater with a full hall of participants and listeners. The meeting of foreign participants in Moscow was organized by the Russian New University under the leadership of Prof. V.A. Zernov, full funding of the Congress was provided by E.A. Ivankov, CEO of the joint-stock company "SALUS". About 50 people from 11 countries arrived.

The main event of the congress was the official announcement of the Nobel Sustainability Trust (NST, Switzerland) award for outstanding research and development in the field of sustainable human development, including alternative energy. The historic event took place at a press conference, led by Alfred Nobel's grandnephews Michael Nobel and Peter Nobel, NST representative Stina Nordlander (Sweden's Beauty Queen 2015), V.M. Tyutyunnik and E.A. Ivankov (Figs. 35 and 36), who subsequently financed this award in the amount of 100 thousand euros.

Figure 35. Participants of the 11th Nobel Congress in the hall of the Tambov Drama Theater (2017). Property of INIC

This congress took place in a year of many anniversaries in nobelistics, but there was one more great anniversary. On February 7, 1617 in the village of Stolbovo (southeast of Ladoga) a treaty of Eternal Peace was signed between Russia and Sweden: 400 years!

Figure 36. Participants of the 11th Congress after the press conference. Property of INIC

This great event was the first outstanding victory of a large number of diplomats during the reign of young monarchs: the first representative of the Romanov dynasty, Tsar Mikhail Fyodorovich (21 years old) and King Gustav II Adolf (23 years old). The era of cooperation between our countries began from this time: Swedish copper and iron began to be supplied to Muscovy, Russian merchants could freely trade in Stockholm, Revel and Vyborg. An excellent example for modern diplomats. Twenty years after this great event, the fortress of Tambov was founded.

For the opening of the Congress, for the first time the INIC Banner and the Nobel Congress Banner were designed and produced (Fig. 37). At the opening ceremony the Hymn of the INIC and the Congress was played for the first time (Fig. 38): music by Perm composer P.A. Kulichkin on verses by Moscow writer M.A. Pekelis (02.08.1947-14.05.2020).

By the opening of the Congress published: Olympic Spring (Nobel laureate C. Spitteler); Nobelistics: an almanac of the International Nobel Movement; Nobels: a view from old

Tambov, 2nd ed. (A.S. Chernov); Nobel Bonistics and Numismatics, vol.1, Bonistics (V.M. Tyutyunnik); Life Continues in Poems: A Collection of Works (Alec Glossa). Information about the congress is widely published (Fig. 39).

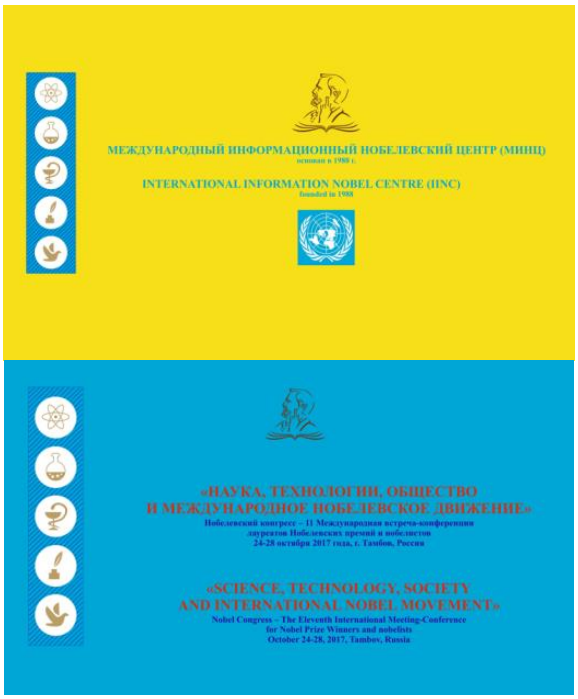


Figure 37. Banners of the MINC and Congress (in Swedish national colors). Property of the INIC

ГИМН
Международного Информационного Нобелевского Центра и Нобелевских Конгрессов в Тамбове

Слова – Михаила Пекелиса
Музыка – Петра Куличкина

1 куплет: Поверь, учёные не врут:
Основа этой жизни – труд!
Не от безделья, не от скуки
Готовы мы служить науке!
Отдать ума природный дар
Познанию природных чар!

Припев: Наше знамя, наша цель –
Это Нобелевский Центр.
С нами он из года в год,
Он научит, он поймёт.
И живёт он, право слово,
От Женевы до Тамбова.

2 куплет: Почему горит звезда,
Почему течёт вода,
Почему растёт трава,
Почему звучат слова,
Как тебе прожить сто лет –
Нам наука даст ответ.

Припев:

3 куплет: Мир прекрасный, светлый, новый
Нас призвал построить Нобель.
Помним мы его слова:
«Путь к вершинам духа труден,
Пусть наука служит людям»!

Припев:

Figure 38. Text of the Hymn of theand the Congress. Property of the INIC

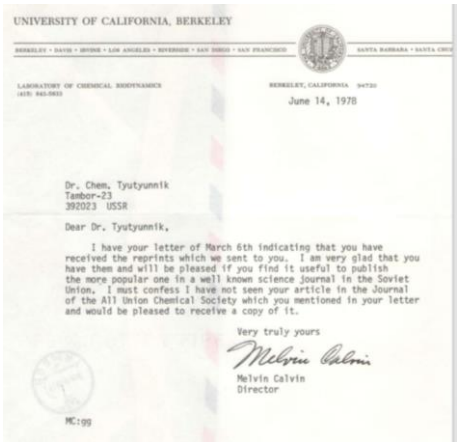
Figure 39. Article about the congress in the journal "Science and Technology in Industry". Property of INIC

Despite the considerable difficulties in preparing and organizing Nobel Congresses, the staff of the INIC continued to work tirelessly to develop the International Nobel Movement. Some examples of this work are shown in Figs. 40-45.

Figure 40. Awarding for M. Nobel (right) with the title of Honorary Professor of the Moscow State University of Food Production (2015). In the center is world chess champion A.E. Karpov. Property of INIC

Figure 41. M. Nobel (second from right) elected Honorary Professor of Tambov State Technical University (2015). Property of INIC

Figure 42. Students from Montenegro at the INIC Nobel Museum (2018). Property of INIC



UNIVERSITY OF CALIFORNIA, BERKELEY

June 14, 1978

Dr. Chem. Tyutyunnik
Tambor-23
392023 USSR

Dear Dr. Tyutyunnik,

I have your letter of March 6th indicating that you have received the reprints which we sent to you. I am very glad that you have them and will be pleased if you find it useful to publish the more popular one in a well known science journal in the Soviet Union. I must confess I have not seen your article in the Journal of the All Union Chemical Society which you mentioned in your letter and would be pleased to receive a copy of it.

Very truly yours

Melvin Calvin
Director

MC:gg

Figure 43. Letter from Nobel Laureate M. Calvin. Property of INIC

12. 12 Nobel Congress "Science, Technology, Society and the International Nobel Movement"

12 Nobel Congress "Science, Technology, Society and the International Nobel Movement" was held on October 2-5, 2019 (Fig. 46). Russian nobelists and scientists from Austria, Belarus, Germany, Greece, Israel, Italy, Netherlands, USA, Japan, etc. actively participated in all events of the Congress. The total number of the Congress participants was 47 persons from 11 countries of the world, who presented 34 reports [47]. By the opening of the Congress, the international publishing house INIC "Nobelistics" presented six new books with a total volume of 80 printed sheets (Fig. 47): "Dear Baroness and Friend... Dear Monsieur and Friend...: Alfred Nobel's correspondence with Bertha von Suttner" (ed. V.M.Tyutyunnik, Tambov), "Our Lives" (I. Hargittai, Budapest), "The Cartography of Emotions" (E. Levin, Haifa), "Nobel class citability and concepts expressing the characteristics and properties of cited scientific documents" (V.S.Lazarev, Minsk), "Works of Nobel Prize winners in literature in Russian (1901-2016)" (A.N. Krasilnikov, Moscow), Proceedings of the Congress "Science, Technology, Society and the International Nobel Movement" [47]. The book "Why Germans Must Know Russian" (H'Arin, Berlin) was also presented with the author's participation.

Figure 44. Banner made on the basis of INIC materials for the museum of Nobel laureate N.N. Semenov in Chernogolovka. Property of INIC

Figure 45. A fragment of one of the halls of the INIC Museum. Property of INIC

Figure 46. Poster for the 12th Nobel Congress (2019). Property of INIC

The thematic focus of the Congress has been defined 30 years ago: the life and activities of A. Nobel and all representatives of the Nobel dynasty, Nobel Prizes, Nobel Foundation and Committees, Nobel firms, life and activities of Nobel Prize winners (including scientific, literary and political activities), analysis of the works of the laureates and development of their ideas, International Nobel movement, Nobel actions in the world, scientometrics and bibliometrics of Nobel information, as well as other aspects of nobelistics. In addition to the usual Nobel topics, two new areas have been added: "Problems of talent and genius" and "Nobel-level research".

Three students of Tambov State Technical University (M.D.Mordasov), Michurinsk State Agrarian University (A.A.Korotkov) and Russian New University (N.V.Mizin), who won the INIC competition for a monthly Nobel scholarship, were awarded with INIC diplomas. The Gold Medal and Diploma of INIC were awarded to outstanding nobelists I. Hargittai, E. Levin, S.S. Antipov (Moscow) and 31 authors' teams (65 persons) winners of the first international competition INIC-SALUS "for technological solutions contributing to sustainable development of mankind".

Genius children from Tashkent (Uzbekistan) Zafarzhon and Zebo Kuchkarovs attended the Congress for the first time as honorary participants and speakers. Nine-year-old Zafarzhon filled in the entire D.I. Mendeleev Periodic System of chemical elements in a few minutes, and six-year-old Zebo listed all Nobel Prize winners in chemistry (Fig. 48).

As usual, envelopes, postage stamps, special stamps and badges, packets and notebooks, pens and other paraphernalia were prepared for the congress (Fig. 49).

Figure 47. Books published for the opening of the congress. Property of INIC

Over the past five years, the INIC continued intensive research, replenishment of the library, museum and archive collections, and electronic documents. The rapid increase of information volumes required more and more efforts and specialists for their processing, cataloging, arrangement, coding, digitization and effective use [48-50]. In this situation, the funding remained on the shoulders of one person, the INIC President, the local Tambov authorities (not to mention the scale of the Russian state) continued to ignore this organization and its activities. Therefore, we approached the 13th Nobel Congress with a mood that was not as rosy and optimistic as it had always been in the past four decades.

Figure 49. Badges and postmarks for Congress. Property of INIC

Figure 48. Congress participants at the "Museum of the Nobel Family and Nobel Prize Laureates" of INIC (2019). Property of INIC

13. 13 Nobel Congress "Science, Technology, Society and the International Nobel Movement"

13 Nobel Congress "Science, Technology, Society and the International Nobel Movement" was held on October 3-5, 2024 and was dedicated to the 125th anniversary of the Nobel Prizes, the 35th anniversary of Nobel conferences in Tambov, as well as to the birthdays of Nobel laureates: the outstanding physicist V.L.Ginzburg (04.10.1916-08.11.2009) and chemists K.Fukui (04.10.1918-09.01.1998) and

K.Wüthrich (born 04.10.1938). It so happened that the author of this article last met with Vitaly Lazarevich Ginzburg in Moscow on July 30, 2004 in Izvestia, flew to Japan to see Ken'ichi Fukui in January 1996, and communicated with Kurt Wüthrich in Lindau (Germany) in June 2016. They are great scientists, as are all 700 scientists who have received Nobel Prizes in physics, chemistry and physiology or medicine since 1901.

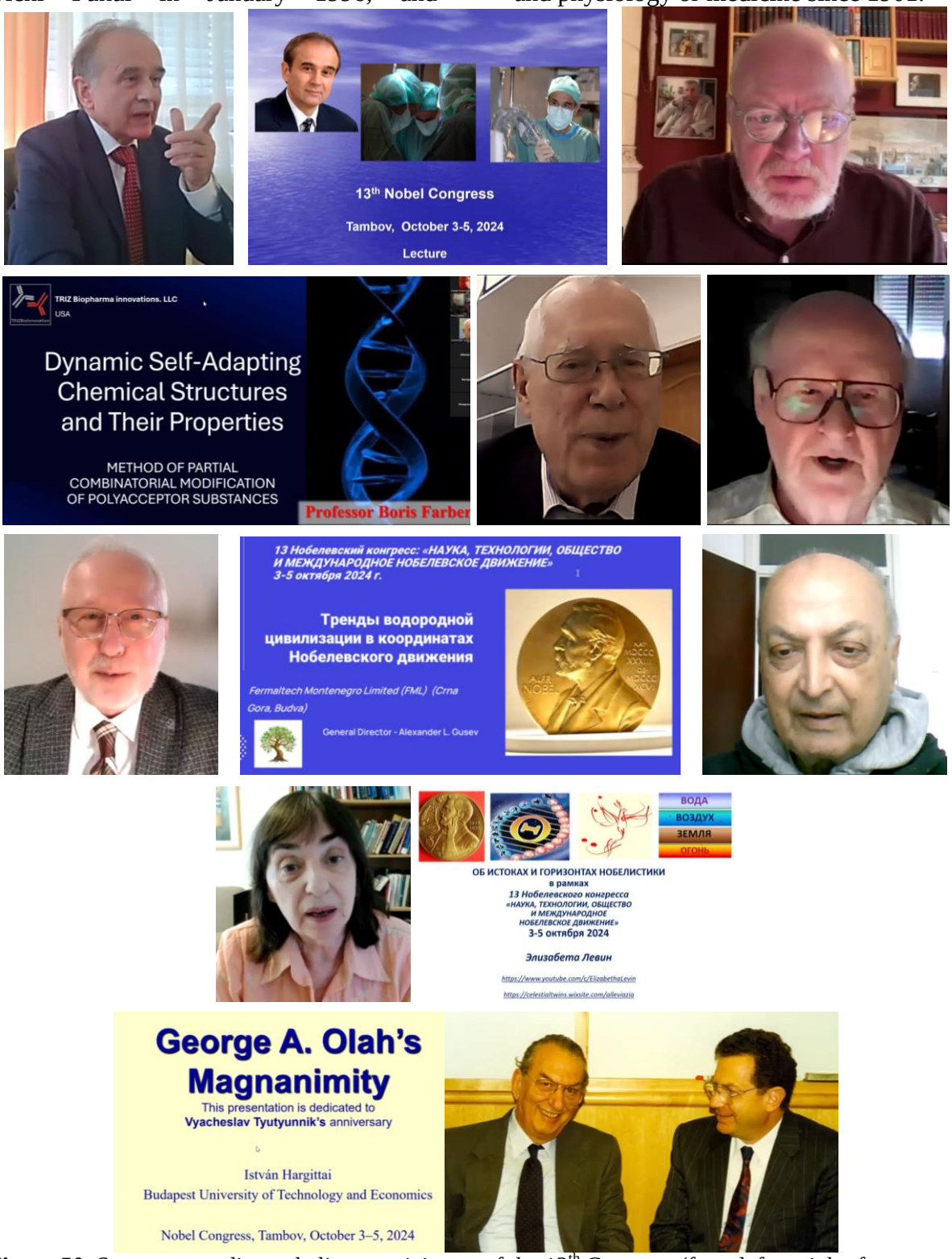


Figure 50. Some outstanding nobelists, participants of the 13th Congress (from left to right, from top to bottom): Prof. N. Korpan and slide of his report, Prof. B. Jangfeldt, slide of Prof. B. Farber's report, Prof. A. Potapov, Prof. V. Etkin, Prof. A. Gusev and slide of his report, Prof. D. Rakovich, Prof. E. Levin and slide of her report, slide of I. Hargittai's report and his photo with Nobel laureate G. Olah. Property of INIC

Unfortunately, the situation in Russia made it possible to hold this congress only online. The congress was attended by more than 50 scientists from 10 countries, including famous nobelists: I. Hargittai (Hungary), B. Jangfeldt (Sweden), N. Korpan (Austria), V. Etkin and E. Levin (Israel), A. Gusev (Montenegro), N. Nikov and T. Zhekova (Bulgaria), B. Farber (USA), D. Rakovic (Serbia), V. Lazarev (Belarus) and others (Fig. 50). Nobel Prize winners R. Hoffmann, R. Penrose and A. Yoshino, as well as M. Nobel sent their greetings. Fundamental reports on the results of their Nobel-level research were made by Professor B. Farber (USA) "Dynamic adaptive drugs: a new era of personalized medicine", Professor N. Korpan (Austria) "Malignant thyroid tumor: organ-preserving cryosurgery. 7-year long-term follow-up", Dr. E. Levin (Israel) "Multiplanetary Nobel Laureates in Literature", Prof. V. Etkin (Israel) "Energodynamic Theory of Biological Evolution", Prof. A. Gusev (Montenegro) "Trends of Water-Hydrogen Civilization in the Coordinates of Nobel Movement", Prof. A. Potapov (Russia) "Fractals and Multifractals in Action: Formation, Development and Strategy of Technologies for Multidisciplinary Radio" and others.

The staff of the INIC carried the banner of the Nobel Prizes as a unique phenomenon of the world culture of the twentieth and twenty-first centuries. Along with other participants of the International Nobel Movement, we sincerely worked to popularize the Nobel Prizes and laureates, as well as to preserve the memory of the Nobel family. For over 40 years, the results of these activities have been presented at thirteen Nobel Congresses and eight other conferences in Tambov.

The author of this article hopes that we have managed to develop humanistic and unifying ideas in science, regardless of nationality, age, gender, religion to approve nobelistics for the benefit of mankind!

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SWOT ANALYSIS OF SUSTAINABILITY STATEGIES AND MEASURES AT "BEHR-HELLA THERMOCONTROL" EOOD

SWOT АНАЛИЗ НА СТРАТЕГИИ И МЕРКИ ЗА УСТОЙЧИВОСТ В BEHR-HELLA THERMOCONTROL

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Abstract *The transition to clean energy and increased energy efficiency is critical for achieving energy independence and combating climate change. The European Union has set ambitious targets, including a 42.5% share of renewable energy by 2030 and a reduction in energy consumption by 11.7%. Companies like Behr-Hella Thermocontrol (BHTC) are taking significant steps to contribute to these goals by minimizing their carbon footprint and increasing energy efficiency. BHTC's strategies include reducing energy intensity, transitioning to renewable energy sources, and implementing energy-efficient technologies such as photovoltaic systems and LED lighting. The company has set a goal to operate all its production sites with renewable energy by 2025. Despite high initial investments, the company is positioning itself for long-term savings and improved sustainability. BHTC's approach demonstrates how industrial actions can help reduce energy consumption, support climate neutrality, and enhance competitiveness in a changing market.*

Key words: *energy efficiency, renewable energy, sustainability, carbon footprint*

Резюме *Преходът към чиста енергия и повишена енергийна ефективност е от решаващо значение за постигането на енергийна независимост и борбата с изменението на климата. Европейският съюз си е поставил амбициозни цели, включително 42,5% дял на възобновяемата енергия до 2030 г. и намаляване на потреблението на енергия с 11,7%. Компании като Behr-Hella Thermocontrol (BHTC) предприемат значителни стъпки, за да допринесат за постигането на тези цели чрез минимизиране на въглеродния си отпечатък и повишаване на енергийната ефективност. Стратегиите на BHTC включват намаляване на енергийната интензивност, преминаване към възобновяеми енергийни източници и прилагане на енергийно ефективни технологии като фотоволтаични системи и LED осветление. Компанията си е поставила за цел да управлява всички свои производствени обекти с възобновяема енергия до 2025 г. Въпреки високите първоначални инвестиции, компанията се позиционира за дългосрочни спестявания и подобрена устойчивост. Подходът на BHTC демонстрира как индустриалните действия могат да помогнат за намаляване на потреблението на енергия, да подкрепят климатичната неутралност и да подобрят конкурентоспособността на променящия се пазар.*

Ключови думи*енергийна ефективност, възобновяема енергия, устойчивост, въглероден отпечатък*

I. INTRODUCTION

According to European climate change reports, measures are being taken across the continent to reduce reliance on fossil fuels, accelerate the transition to clean energy, and build a more sustainable and diversified energy system to strengthen energy independence and ensure stable and affordable energy supplies for citizens and businesses. Many of these actions and measures have been implemented at the national level, such

as accelerating the deployment of renewable energy sources. At the industrial level, it is also necessary to take action to save energy and reduce energy bills. This would contribute to reducing solid fuel use, thereby lowering CO_2 emissions. Such actions provide better conditions and incentives for the industry to invest in more efficient, eco-friendly solutions.

II. MAIN TEXT

Achieving energy independence is linked to increasing the production of clean, renewable energy. REPowerEU aims to raise energy efficiency targets and the overall share of renewable energy sources. The current target for renewable energy is at least 42.5% by 2030, to reduce overall energy consumption in the EU by 11.7% compared to projected energy consumption for 2030 [1]. By adopting energy-efficient and energy-saving behaviours, consumers can take greater control over their carbon footprint and reduce their energy bills. Given the current global events and the consequences of climate change, companies must realize their responsibility toward sustainability. Behr-Hella Thermocontrol (BHTC) is such a company, striving for sustainable solutions and entrepreneurial responsibility for current and future generations. The goal is to achieve carbon neutrality at all production sites concerning direct CO2 emissions and those related to purchased energy. Therefore, continuous efforts are made to minimize the corporate carbon footprint. The remaining emissions are to be compensated through certified climate protection projects. In the long term, the company aims to achieve climate neutrality concerning its products and supply chain.

BHTC's management framework and policies are focused on risk assessment related to quality, environmental protection, workplace health and safety, energy, and information security. An integrated management system for quality, environmental protection, occupational safety, energy, and information security is implemented and continuously improved at all BHTC locations while complying with applicable legal and regulatory requirements. Active efforts are underway to reduce environmental impact and energy consumption to improve the industrial environmental footprint.

Sustainability is considered a responsibility for the entire BHTC group. The management of BHTC is responsible for defining the areas of action, goals, and scope of sustainability-related activities. The management board and a sustainability team determine sustainability priorities and the company's strategic direction.

1. Environmental management

Environmental protection for current and future generations is a central part of the company's responsibility. In this context, BHTC strives to reduce its environmental footprint using a holistic environmental management system certified at all production sites by the ISO 14001 standard.

Energy consumed at production sites is a key aspect of the environmental management system – not only for reducing emissions and saving resources but also as a key lever for reducing operational costs. For this reason, BHTC has set a target to continuously reduce energy intensity each year, with a goal of at least a 10% reduction by 2030 [2]. The specific energy consumption target is 56.8 kWh per 1,000 EUR in sales.

In addition to annual reductions in energy intensity, a major focus is the transition to renewable energy sources. The target is to exclusively generate electricity from renewable sources by the end of 2025. Efforts are being made to generate renewable energy in-house and purchase renewable energy. As of 2021, the share of electricity from renewable sources was 41%, to reach 100% by the end of 2025.

Compared to 2021, there has been a significant reduction in energy consumption while achieving a notable increase in sales. Specifically, natural gas consumption has decreased by approximately 16% compared to 2021. These optimization measures contribute not only to the success of managing the European gas crisis but also to a lower environmental impact. In 2022, a 10% improvement was achieved compared to the baseline year, with further reductions in specific energy consumption expected. This is due to the vertical integration of a new production step in the display manufacturing process [3].

To achieve the goal of fully operating all production sites with renewable electricity by 2025, BHTC relies on three main components: in-house electricity generation from photovoltaic systems, purchasing green electricity from local electricity providers, and purchasing certificates for electricity from renewable sources. There are specific goals regarding carbon dioxide neutrality: Goal 1 has seen a reduction from 1,688 to 1,220 tCO_2 annually, representing a 27.7% decrease within one year.

Compared to 2021, BHTC has successfully implemented its first photovoltaic system at BHTC Mexico in August 2022. This system began producing fully self-generated energy to cover a large portion of energy needs. Following this project, the strategy continues with ongoing evaluations for the implementation of photovoltaic systems at other production sites.

In 2022, BHTC made various optimizations in packaging materials. By switching from paper filling material to paper-based air cushion material, approximately 44% of annual paper packaging material was saved. Additionally, the material for all corrugated cardboard boxes was changed from paper to a mix of 30% grass and 70% recycled paper (depending on the type of paper). Packaging concepts were also altered for several spare parts deliveries, replacing PE foam cushions with corrugated cardboard packaging. This change not only reduces the plastic packaging but also reduces the overall energy consumption during packaging material production. Moreover, the volume of the packaging was reduced by 60%, which resulted in lower transport costs to the customer due to the higher density of the packaging.

The production facility in Bulgaria has achieved world-recognized certification according to ISO 50001 for energy management. The certification process is linked to the establishment of an energy policy, implementation of energy management strategies and action plans, and monitoring and measurement of energy efficiency KPIs.

An independent certification body's evaluation confirms that BHTC's energy management system meets the requirements of the ISO 50001 standard. BHTC Mexico successfully installed a 499.8 kWp photovoltaic system by August 2022. In the past year, the system generated 296 MWh of electricity, covering over 7% of the energy demand in Mexico in 2022. Since the system will operate for the entire year in 2023, it is expected that coverage will increase to 19%.

Several decisions and measures have already been implemented to reduce energy consumption, including:

- Implementing and optimizing daylight control and air conditioning in production.
- Replacing production building lighting with LED lighting. These improvements will sustainably reduce electricity consumption, aiming to reduce specific site consumption to 1,330,000 kWh annually (~21% of total electricity consumption in 2021).

Moreover, the implementation of photovoltaic systems at all production sites for generating electricity from solar energy will result in a share of self-produced electricity reaching 20%.

2. SWOT Analysis of Energy Efficiency in the Company

Strengths:

- Reduction in electricity costs: The implementation of a photovoltaic system will provide 20% savings on electricity consumption.
- Improved energy efficiency: LED lighting will reduce electricity consumption for lighting and increase the lifespan of the lights.
- Automation and optimization: Daylight control and air conditioning optimization will improve the working environment and reduce unnecessary energy consumption.
- Environmental image: The use of renewable energy sources (RES) will enhance the company's reputation and meet environmental requirements.
- Opportunities for state subsidies and grants: There are funding opportunities through energy efficiency programs.

Weaknesses:

- High initial investments: Purchasing and implementing new technologies require significant capital expenditure.

- Need for training: Staff may require training to operate and manage the new control and monitoring systems.
- Return on investment time: Despite cost reductions, the payback period for the investment will take time.

Opportunities:

- Access to additional funding: European funds and national energy efficiency programs can support investments.
- Improvement in competitiveness: Reduced energy costs will make the company more competitive in the market.
- Expansion of sustainable practices: Opportunity to implement additional energy-efficient technologies in the future.
- Regulatory advantages: Opportunity to better comply with future environmental requirements and standards.

Threats:

- Technological risks: There is a potential for technical failures or issues with integrating new systems.
- Regulatory changes: Possible changes in legislation or subsidies that could impact the payback period.
- Changes in energy prices: A reduction in energy prices could extend the payback period.
- Resistance to change: Some employees may resist the new technologies and changes in working methods.

III. CONCLUSIONS

Investing in energy efficiency will lead to significant savings, improved sustainability, and increased competitiveness. Despite the initial costs and challenges, the long-term benefits are considerable, especially if the company utilizes external financing and successfully manages the change process.

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USE OF THE GAS-DISCHARGE PHOTOGRAPHY METHOD FOR MONITORING THE FUNCTIONAL STATE OF THE HUMAN ORGANISM AS A RESULT OF THE INFLUENCE OF ANTHROPOGENIC ACTIVITY

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Abstract: *The gas-discharge photography (GDP) method was used to assess the health of the population in an industrial region in comparison with changes in the environmental situation in it over the years.*
The method of fixing the gas-discharge glow around the fingers of children and adults who worked at the enterprise or lived near it on an X-ray film was used.
The diagnostic criteria of P. Mandel were used to analyze the obtained gas-discharge photographs. According to them, there is a correspondence between the type of glow in the form of a gas-discharge image associated with human bioenergetics and the formation of pathology. Doctor P. Mandel established a correspondence between the GDP sectors of the fingers and organs.
The use of the GDP method of terminal points of the extremities quite informatively demonstrated the correspondence of defects in the glow corona around the fingers of children and adults to changes in the parameters of air pollution and a natural reservoir in the region of the operating enterprise.
Examination in the system of ecological monitoring allowed to establish the predominant influence of certain negative factors on certain organs and systems of the body. It was concluded that the use of the GDP photography method is advisable in population studies for the timely establishment of the negative impact of human anthropogenic activity on the ecological state of the environment and the health of the population.

Key words: *gas-discharge photography, ecology, biosphere, image analysis*

I. INTRODUCTION

The development of natural resources requires adherence to the principles of ecology – the preservation of historically established relationships between biota and inanimate objects. If the balance between them is disturbed, complex processes of metabolism and energy in the biosphere are disrupted, and the preservation of healthy life activity of living beings, including humans, is threatened.

Therefore, it is important to control the state of functional interrelations in the human body in a certain population of a region of a particular nature management zone. Their dysfunction will initially, at the pre-disease stage, manifest itself in non-specific changes, which must be identified as early as possible for timely regulation of the ecological situation in regions of anthropogenic impact on the environment.

Therefore, it is urgent to search for methods for early detection of the processes of maladaptation in the human body to adverse external influences. Biochemical studies detect them too late, when pathological processes in the organs have already formed. Therefore, studies of changes in the functional state of the body's cells at the biophysical level deserve attention. Changes in the latter are interconnected even with minor changes

in biochemical reactions at the cellular level, which undoubtedly follows from the latest scientific phenomena about biological life and health.

The tissues of the human body consist of atoms and are essentially bundles of energy. The basis of the phenomenon of life in the human body lies in the peculiarities of the course of energy processes at the microlevel of the structure of cells and tissues - subatomic, atomic and molecular levels [10-12].

At the microlevel, magnetoelectrochemical processes are involved, and for living complex organic molecules of tissues *in vivo*, constant intramolecular and intermolecular formation and transfer of energy and charge are characteristic. The biopolymer, through its own oscillations, converts the chemical energy of ATP into a coherent form, and this allows the biopolymer not to waste energy on thermal processes, but to transport it non-radiatively further along its chains. The biopolymer acts as an oscillator-transformer of energy, which carries out coherent energy conversion due to the quantum-mechanical features of the structure of its primary chains, which were formed at the stage of chemical evolution [13].

The latest knowledge for the first time explained the role of water molecules in an adequate physic-chemical aspect - broader than just a solvent, corresponding to the quantum-mechanical ideas of the modern level of development of fundamental natural science [10-13].

The ability of water molecules to self-organize in the form of energy tension of fractal crystals is a key property that determines the energy supply of the molecular level and the realization of the phenomenon of life in living biological systems, including humans [1, 12]. Of course, the state of water in the body will be sensitive to external influences, changing the state of biological polymers.

Fractal energy-tensioned water crystals formed in the cytoplasm of living cells are connected to biopolymers by hydrogen bonds [2, 12, 13].

When incoherent energy from ATP enters a biopolymer molecule *in vivo*, it is converted into a soliton through oscillations and then has two options for further path - to move along the biopolymer chain further (the first option) and to pass from the biopolymer to the environment surrounding the biopolymer - to water molecules (the second option). The mechanism and possibility of the soliton's transition from the biopolymer chain to the environment - to water without loss of energy were proven in works [2, 12].

Without the implementation of magnetoelectrochemical processes, the biological system is transformed from living into non-living - into a set of molecules in its essence. The mechanism of non-contact energetic molecular interactions "biopolymer-water-biopolymer-water" is fully realized only in a living biological system *in vivo* and is simultaneously a mechanism for ensuring its existence [12, 13].

Based on the positions of magnetoelectrochemical theory, it is important to note that the phenomena of life and health acquire new characteristics, since they must now be described as a state of adequate levels of the course of magnetoelectric energy processes between biomolecules, which is objectively manifested at the macro level by the normal level of metabolism, functioning of tissues and organs of the human body. Accordingly, it is logical to consider disease as a violation of the magnetoelectric state of biomolecular structures, death - as their complete absence, and the human body - as one of the forms of magnetoelectrochemical organization of biological matter on Earth.

The potential energy in biological structures and in the body as a whole allows visualization when studying the parameters of gas-discharge radiation around the extremities of human fingers and toes in a high-frequency electromagnetic field. At the same time, the object’s own ultra-weak photon radiation, known as gas-discharge radiation, is amplified [3, 6, 7]. The method allows recording minor changes in biochemical processes in the cell, as energy processes and their transmission through biopolymers change, as well as the coherent properties of extracellular water, the biological significance of which is known and the gas-discharge radiation method records these processes [15].

II. MAIN TEXT

The objective of the study was to establish the possibility of assessing the negative impact of environmental degradation on the state of functional relationships in the human body in the region based on the results of the gas-discharge photography method.

Materials and Methods. The functional health of children in the region, as well as adults living and working in the same industrial region (plant workers) was examined (study no. 1). In dynamics, 52 children and 28 adults living and working near the plant were examined in 2 years (study no. 2). The obtained results of the examination based on the gas-discharge photography method were compared with the indicators of the environmental situation in the region in dynamics for the same years.

An experimental setup of a gas-discharge glow recorder [14], X-ray room conditions, and X-ray film were used. The gas-discharge glow corona was photographed around the fingers.

To analyze the obtained gas-discharge photographs, P. Mandel's diagnostic criteria were used. According to them, there is a correspondence between the type of glow in the form of a gas-discharge image associated with human bioenergetics and the formation of pathology. Dr. P. Mandel established a correspondence between the sectors of the GDP of the fingers and organs [7]. We also used the results of their own research [8, 9, 16, 17].

Normally, the glow corona around the fingers of the extremities is represented by an inner oval, a middle layer in the form of evenly spaced streamers, and an outer layer with glow (Fig. 1). In case of psychoemotional imbalance, streamers appear in the glow corona (endocrine glow type according to P. Mandel) (Fig. 2).

In case of functional stress with increased cellular metabolism in organs or systems, additional bit images in the form of dots are registered (toxic glow type) (Fig. 3). In case of structural changes in tissues, dystrophic changes in cells in chronic pathology and increased anaerobic respiration, photon emission decreases and thermal energy increases. On the HDF, the streamer layer appears thickened, and its pattern is erased (degenerative glow type) (Fig. 4).

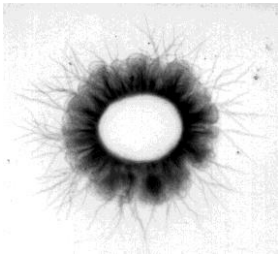

Fig. 1. Normal

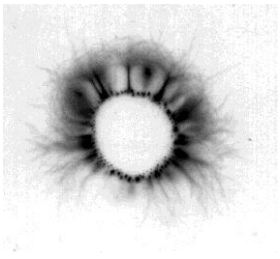

Fig. 2. Endocrine type of GD-luminescence (ET)

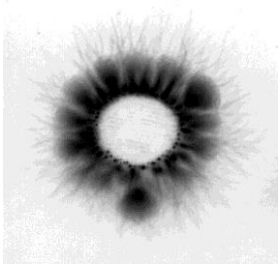

Fig. 3. Toxic type of GD glow (TT)

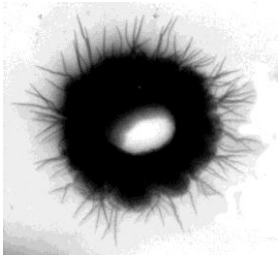

Fig. 4. Degenerative type of GD glow (DT)

The results obtained and their discussion.

The results of gas-discharge photography during examination of adults are presented in the table and analyzed taking into account the sanitary and hygienic characteristics of the plant area in dynamics over the years.

Table 1
GDP results in children in dynamics (losses in the crown)

Signs	Study #1% of the group	Study #2 % of the group	Signs	Study #1% of the group	Study #2 % of the group
Head	58,1	34,9*	Psyche	35,5	30,2
Rectum	22,6	25,6	Hormonal system	35,5	23,2
Spine	38,7	55,8	Gastroduodenal zone	35,5	39,5
Vessels	54,8	51,2	lymphopharyngeal ring	64,4	30,2*
urinary system	25,8	18,6	Heart	22,6	27,9
biliary system	29,0	25,6	Pituitary	67,7	48,8
Reproductive system	32,2	20,9	Respiratory system	25,8	16,3

Note: *- the difference between the indicators is statistically significant.

Table 2
GDP results in children in dynamics (intoxication)

Groups / signs, %	emotional instability	Asthenia	general intoxication	Intoxication						
				hormonal system	lymphopharyngeal ring	rectum	urinary system	biliary system	Reproductive system	Respiratory system
№1 (31)	48,4	51,6	48,4	25,8	61,3	19,4	25,8	61,3	61,3	19,4
№2 (43)	32,5	37,2	34,9	32,5	76,7	53,5*	37,2	30,2*	48,8	48.8*

Note: *- the difference between the indicators is statistically significant

The obtained results were compared with changes in the environmental situation in the survey area. In particular, negative trends in changes in the environmental situation in the atmosphere were observed. There was a gradual increase in emissions into the atmosphere (by 10 thousand tons or 42%) due to the growth of industrial output. Of these, solid emissions increased by 35%, the technogenic load per capita increased by 54% and amounted to 140 kg against 75 kg two years ago. This causes irritation of the mucous membranes of the upper respiratory tract,

local intoxication, and the risk of developing pathology of the respiratory system. In accordance with this, according to gas-discharge photography, a statistically significant increase in the incidence of intoxication in the respiratory system was revealed in children over these years, which reflects the high risk of their inflammation.

Precipitation pollutes water bodies and causes their toxicity with heavy metal salts. During the period under study, the volumes of untreated wastewater discharge and the amount of iron in them increased (by 7,296 thousand cubic meters per year and 3.7 tons, respectively). Outdated wastewater treatment technologies provided for the widespread use of chlorine, as a result of which a large number of toxic organochlorine compounds were determined in drinking water. When analyzing the quality of drinking water supply during this period, the number of non-standard samples for physicochemical studies increased due to toxicological indicators exceeding the norm by 1.5-1.8 times. The increase in the toxicity of drinking water also increased due to soil contamination with unutilized industrial waste in the area of the enterprise.

Toxic substances have a negative effect on the peripheral nervous system and bone tissue, which are sensitive to the listed toxic factors. In gas-discharge photographs of fingers, a tendency toward an increase in the frequency of fallout in the corona of radiation in the spine/nervous system area appeared in dynamics over the years, which reflects the high sensitivity of the method to changes in the ecological state of the environment. As is known, the water factor is one of the leading factors in the growth of intestinal pathology. When analyzing the infectious morbidity of the population in the region, an increase in acute intestinal infections and viral hepatitis was observed in dynamics over the years. The percentage of non-standard samples for virological indicators in the city river also increased. Viral protection of water supply facilities remained low, although the virological contamination of drinking water decreased somewhat. In children, immunocompetent intestinal cells actively respond to infection in the immune response, due to an unformed immune system, compared to adults. During the GDP examination, a statistically significant increase in defects in the rectum/large intestine area was observed over time, which reflects immune activity against pathogens.

A statistically significant decrease in the frequency of occurrence of fallout in the corona of radiation in the head area was observed, a tendency to decrease them in the pituitary gland, lymphopharyngeal ring. This reflects a decrease in the phenomena of emotional instability. The latter is also associated with an improvement in the state of the autonomic nervous system, which regulates the work of all internal organs of a person.

In children, general intoxication was less often recorded in gas-discharge photographs with a statistically significant decrease of two times in the biliary system, which correlates with the data of environmental indicators in the region.

In particular, a decrease in emissions with wastewater into the city river over the past period of the amount of suspended matter (by 95.5 tons) and oil products (by 2.6 tons) was recorded, in the detoxification of which the hepatobiliary system (gallbladder, liver) is primarily active, which, as indicated above, is functionally closely connected with the emotional sphere of a person through the autonomic nervous system. When analyzing the GDP of adults working at an industrial enterprise and those working near it, we found a generally negative dynamics of functional relationships in the body, both in the former and in the latter, which correlates with the above data on the environmental situation by year in dynamics.

The data presented in Table 3 indicate a greater increase in adults in signs of dysfunction of the vegetative-endocrine regulation, compared with children, in the form of fallout in the corona of radiation in the heart, head, hormonal system, gastroduodenal zone, which is expressed in a tendency to more frequent signs of emotional instability and asthenia (decrease in overall performance). Problems are possible in the specified organs in the form of spastic reactions, with the duration of which a state of local stress or structural changes in tissues appears with the formation of diseases of the corresponding organs and systems (cardiac, vascular diseases of the head, pathology of the stomach and duodenum, thyroid and other endocrine glands).

Table 3
Results of GDP in adults during control in dynamics

GDP photo attributes, %	2004 year (151)	2006 year (28)	GDP photo attributes, %	2004 year (151)	2006 year (28)
Energy drops:			**Intoxication:**		
heart	7,3*	39,3	Psyche	53,0	71,4
psyche	25,8	39,3	Hormonal system	48,3	64,3
head	31,1*	60,7	Lymphopharyngeal ring	86,1	92,9
rectum	15,9	28,6	Rectum	76,8*	92,9
spine/nervous system	27,2	42,9	Urinary system	87,4	96,4
vascular system	34,4	46,2	Hepato-biliary system	58,3*	96,4
urinary system	30,5	21,4	Reproductive system	83,4	92,9
hepato-biliary system	26,5	35,7	Respiratory system	75,5*	92,9
reproductive system	23,2	25	spine/nervous system	39,1*	82,1
hormonal system	23,2*	46,2	Gastroduodenal zone	37,1	57,1
respiratory system	11,3	10,7	Heart	32,5*	67,9
stomach	17,2*	53,8	Vascular system	59,0	75,0
Lymphopharyngeal ring	13,9	25	**General intoxication**	57,6*	82,1
Emotional instability	35,1	53,8	Degenerative type of radiation	29,1	46,2
Asthenia	11,9	28,6			

In adults living near an industrial enterprise but not working there, an increase in the frequency of both general and local intoxication was observed in dynamics - in the area of the large intestine/rectum, biliary, respiratory system, heart, spine/nervous system. In contrast to children, there was an increase in general intoxication, local in the area of the biliary system, which indicates a lower resistance of the body to toxic factors in the environment. In total, the listed defects in the radiation corona of the examined adults in dynamics indicate a greater functional stress in their excretory organs (gastrointestinal tract, respiratory system) and adaptation systems (cardiovascular, peripheral nervous system) with a high risk of developing inflammatory processes and systemic chronic pathology.

III. CONCLUSIONS

1. The GDP method allows establishing the relationship between the dynamics of functional relationships in the body and changes in the environmental situation in the region.

2. The adult population is less adapted to changes in the environmental situation. Therefore, it is advisable to examine adults in the environmental monitoring system as a contingent with early maladaptation for early detection of an increase in the negative impact of the environment.

3. It is advisable to examine preschool children in the environmental monitoring system to establish the predominant influence of certain negative factors on certain organs and systems of the body.

4. It is advisable to use the GDP method in population studies for the timely establishment of the negative impact of human anthropogenic activity on the ecological state of the environment and public health.

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WASTE MANAGEMENT GENERATED FROM PRODUCTION AT "BEHR-HELLA THERMOCONTROL" EOOD

УПРАВЛЕНИЕ НА ГЕНЕРИРАНИ ОТПАДЪЦИ ОТ ПРОИЗВОДСТВОТО В ЗАВОД „БЕР-ХЕЛЛА ТЕРМОКОНТРОЛ" ЕООД

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Abstract: *The legislation in the field of waste management in Bulgaria has undergone constant changes in recent years to be brought into line with European standards. This requires companies to develop their activities in such a way as to meet the increasingly higher goals and requirements set for them. On the other hand, it determines the need for greater transparency and stricter control over waste activities. A number of reporting obligations have been formulated to provide the most complete information about the path of waste from generation to its recovery or disposal.*
"Ber-Hella Thermocontrol" actively cooperates with the competent state and municipal institutions and with all stakeholders to improve the environment, as a result of which the amount of waste generated is decreasing.
In this work, an analysis of the total waste generated by technological lines in the plant and their classification, as well as an analysis and comparison of the waste generated for 2020 and 2021, has been made. It is clear from it that the hazardous waste generated in 2021 is almost half the hazardous waste generated in 2020, or there are 1.8 tons less hazardous waste.

Key words: *waste, management, circular economy*

Резюме: *Законодателството в сферата на управлението на отпадъците в България търпи постоянни промени през последните години, с цел да бъде приведено в съответствие с европейските нормативи. Това налага фирмите да развиват дейността си така, че да отговарят на все по-високите цели и изисквания, които им се поставят, а от друга страна – обуславя нуждата от по-голяма прозрачност и по-строг контрол върху дейностите с отпадъци. Формулирани са редица задължения за отчетност, които целят да осигурят максимално пълна информация за пътя на отпадъците от генерирането до оползотворяването или обезвреждането им.*
„Бер-Хелла Термоконтрол“ си сътрудничи активно с компетентните държавни и общински институции и с всички заинтересовани страни за подобряване на околната среда, в резултат на което количеството на генерирания отпадък намалява.
В настоящата работа е направен анализ на общо генерираните отпадъци по технологични линии в завода и тяхната класификация, както и анализ и сравнение на генерираните отпадъци за 2020 и 2021 година. От него става ясно, че опасните отпадъци, генерирани за 2021 година, са почти два пъти по-малко от опасните отпадъци, генерирани за 2020 година, или има 1,8 тона по-малко опасен отпадък..

Ключови думи: *отпадъци, управление, кръгова икономика*

I. INTRODUCTION

Waste is one of the main problems of modern society. According to the concept of a circular economy, it is necessary to develop and modernize production processes to reduce the amount of waste generated and turn it into a

product. This is necessary due to the rapid development of the modern consumer society, generating waste with a problem related to its disposal. The sustainable development strategy proposed by the European Union emphasizes that the link between economic development, resource use, and waste generation must be broken [1]. As a full member of the European Union, one of the problems facing Bulgarian legislation is the environmentally friendly management of hazardous waste. By adapting the requirements of Directive 1999/31/EC on the landfill of waste, as well as the National Waste Management Plan, a ban on the landfill of hazardous waste is introduced into Bulgarian legislation [2].

The purpose of the article is to analyze the type and quantities of waste generated from the plant's technological lines and their management.

II. MAIN TEXT

Behr-Hella Thermocontrol (BHTC) covers the entire process from product design to the production of the complete climate control system. This process combines diverse areas of expertise – from software, electronics and mechanics to all technologies required for the development and production of existing and future operating and display elements. The main products it offers are panels and devices for servicing and controlling automotive air conditioning systems, climate sensors, air controllers, and PTC window heaters. "Behr-Hella Thermocontrol" EOOD is a first-level supplier, i.e., it supplies its products directly to automobile manufacturers. The company's main customers are large automobile manufacturers, such as those from the Volkswagen group, BMW, Mercedes-Benz, Porsche, General Motors, etc. In addition to the central production base in Lippstadt, Germany, BHTC also has divisions in the USA, China, India, Japan, Finland, and Mexico. During the production process of "Behr-Hella Thermocontrol" EOOD, as in the operation of any industrial enterprise, household and production waste is generated, which the management strives to manage in an environmentally friendly manner.

1. Technological lines and generated waste.

The production is a continuous, three-shift operation, with the total number of personnel exceeding 600 people. When performing these activities, the following waste is generated, classified according to Appendix No. 1 of Regulation No. 2 [3]:

- Paper and cardboard packaging (15 01 01). Including cardboard and office paper.
- Plastic packaging (15 01 02). This group includes stretch film, nylon, and plastic straps used in packaging materials.
- Packaging made of wood materials (15 01 03). Some of the boxes with materials are delivered placed on wooden pallets (type "Europallet"). If the pallets are damaged, they are discarded.
- Mixed municipal waste (20 03 01)

SMT/SMD lines and generated waste. The SMT process is a technology for the surface mounting of electronic components on panels. This technology is preferred because the process is fully automated and allows the assembly of more components on a smaller area, in less time, with greater positioning accuracy.

The waste generated by the printer are:

- Absorbents, filter materials, wiping cloths and protective clothing (15 02 02*).
- During the production process, it is necessary to maintain ideal cleanliness on the surface of the printed circuit boards. Every speck of dust causes defects on the control board. Cleaning is carried out using degreasing and cleaning solutions based on isopropyl alcohol (isopropanol), etc. The waste that belongs to this group is - paper used in the printer, paper used for manual cleaning of screens, absorbent cloths, and protective gloves.
- Packaging containing residues of hazardous substances or contaminated with hazardous substances (15 01 10*).
- This group includes tubes of vigon used for cleaning, silicone paste bottles, absorbent towel packaging, and PVC cleaning agent bottles. All of these products contain hazardous chemicals and are, therefore classified as hazardous waste.
- Plastic packaging (15 01 02).

The paper used in the printer is wound on plastic spools and wrapped in plastic foil.

The waste generated by the placer comes entirely from the feeders and belongs to the group of plastic packaging waste (15 01 02).

- Rolls. The electronic components are packaged in a tape (similar to a tape recorder), wound in concentric circles on a plastic roll. The rolls come in 3 sizes, all three of which are waste.
- Tape scraps. After the machine "takes" the components from the tapes to place them on the boards, waste from tape scraps is generated. They are made of polypropylene, polystyrene, and coated paper.
- PVC foil. To avoid defects, the rolls with components are stored in special PVC packages that prevent their integrity from being damaged or moisture from penetrating.

After the panels are saturated with components, they pass through the oven, where the final phase takes place - the soldering of the components by drying. It works according to a set program. Temperature control is very important, so a temperature profile is taken for each product. The components are heated, with the temperature gradually changing from room temperature to 280 degrees to avoid thermal shock. On the inside of the dryer, there is a lining, which is a granular silicate material with absorption properties that absorbs moisture. The gases released are captured and filtered, resulting in condensate from the solder vapours, which are deposited on filters.

The waste generated by the oven is:

- Absorbents, filter materials, wiping cloths and protective clothing contaminated with dangerous substances, granules from dryers (15 02 02*). These are granules and filters. Both wastes are hazardous. The condensate that is captured by the filters contains lead compounds. They are replaced every month

The waste generated by the dishwasher is:

- Wastewater containing dangerous substances (11 01 11)*. During washing, a 1% solution containing lead compounds is separated from the solder paste residues. This defines the waste as hazardous.

The waste generated by the tamping machine is:

- Sawdust, shavings and cuttings of non-ferrous metals (12 01 03). During the operation of the machine, the metal pins are discarded, which are wound in concentric circles on large plastic rolls. These rolls are reusable and are returned to the manufacturer.

- Paper and cardboard packaging (15 01 01). When winding the rolls, a paper tape is placed between the individual layers of pins.

- Mixed municipal waste (20 01 03)

The waste generated by the varnishing line is:

- Absorbents, filter materials, wiping cloths and protective clothing contaminated with dangerous substances (15 02 02*). Paper is used to clean traces of varnish and is, therefore classified as hazardous waste.

- Packaging containing residues of dangerous chemicals or contaminated with dangerous substances (15 01 10*). This group includes varnish and thinner tubes.

- Other solvents and solvent mixtures (14 06 03*). Residues from cleaning and varnishing solutions are hazardous waste, a mixture of solvents containing up to 1% varnish.

Waste generated by the FMS machine (Table 1).

During the manufacturing process for some of the electronic boards, it is necessary to solder the electronic elements with a soldering material (similar to tinol). After soldering, slag is released, which contains lead, tin, and silver compounds and is therefore classified as hazardous waste – 11 05 04* Spent flux. PCB scraps are waste obtained after a machine cuts the edges of the board. According to the classification, the waste code is (16 02 16) Components from obsolete equipment – PCB scraps. Thermal paste is used to solder elements to the board. According to the classification, the waste code is 15 02 02* Absorbents, filter materials, wiping cloths and protective clothing contaminated with hazardous substances. The displays and sensors used for product assembly are packed in plastic trays. They are single-use and are classified as waste with code 15 01 02, Plastic packaging.

The following waste can be generated from all production machines:

- Components removed from end-of-life equipment, unusable or defective printed circuit boards (16 02 16)

- Hazardous components removed from completely obsolete equipment (16 01 15*)

These two wastes are formed when removing defective electronic components from control boards. The board repair staff replaces the defective components with new ones by hand. The waste is collected by them in plastic boxes, and at the end of

the work shift it is transported by the maintenance staff to the site for temporary storage.

Table 1.
Waste generated by FMS machines

FMS Machine	Generated waste
Volvo BB Truck	Metal pins, circuit board scraps and mixed municipal solid waste
Volvo SPA	Mixed municipal solid waste
PTC.35.UP (BMW)	Circuit board scraps, thermal paste and mixed municipal solid waste
MQB KME	Mixed municipal solid waste
MQB HECK	Metal pins, plastic trays and mixed municipal solid waste
BR 222	Mixed municipal solid waste
MAN CU	Plastic trays
MAN BB	Circuit board scraps, connectors (for scrap), lean-tin flux, plastic trays and mixed municipal solid waste
SCANIA Truck	Circuit board scraps, plastic trays and mixed municipal solid waste
CMF-F011	Silver flux, plastic trays and mixed municipal solid waste
MLB EVO PTC	Circuit board scraps, thermal paste and mixed municipal solid waste
MND Crafter	Circuit board scraps, plastic trays and mixed municipal solid waste
MQB 27	Circuit board scraps, plastic trays and mixed municipal solid waste

2. Municipal solid waste

Municipal solid waste or Household waste is a type of waste that arises as a result of daily human activity, including activities accompanying production. The majority of it is generated by the administrative part of the plant.

- Mixed household waste (20 03 01). This is waste that is separated from daily human activity in the administrative building, the company's headquarters, and service premises. It cannot be recycled or utilized.

At the temporary waste storage site, there are four metal containers of the "Bobar" type, in which mixed household waste collected from all premises in the building is disposed of. The municipality of Bozhurishte, with which the plant has a contract, is responsible for its removal. The company with which the municipality has a contract is EUROIMPEX. The removal regime is twice a week, and the waste is deposited at the Regional Non-Hazardous Waste Landfill in Kostinbrod.

- Plastic packaging (15 01 02) – single-use bottles and cups. The daily consumption of soft drinks and drinking water results in the disposal of plastic cups and bottles, which are collected separately.

- Paper and cardboard packaging (15 01 01) – office paper As a result of administrative activities, the plant generates office paper waste. It is collected separately from cardboard packaging due to the different density of the paper.

- Packaging containing residues of hazardous chemical substances or contaminated with hazardous substances (15 01 10*). Preparations are used in various activities related to the cleaning of the plant. Some of them contain hazardous chemical substances and are therefore classified as hazardous waste.

- Waste printing toner containing hazardous substances (08 03 17*). Administrative activities require the use of copying and printing equipment. As a result, toner cartridges are disposed of. They contain residues of inks, dyes, and pigments and are therefore classified as hazardous waste.

- Non-chlorinated mineral-based hydraulic oils (13 01 10*). Compressors that operate with non-chlorinated mineral-based hydraulic oils. Compressor maintenance requires periodic replacement of hydraulic oils, which ensures normal operation and a long service life of the compressors.

3. Waste generated at "Behr-Hella Thermocontrol" EOOD

The waste is divided into hazardous and recyclable waste.

The amount of hazardous waste generated at the plant for 2020 and 2021 is presented in the following figures 1 to 4 below:

Summarized quantities of hazardous waste for 2020 - graphical representation

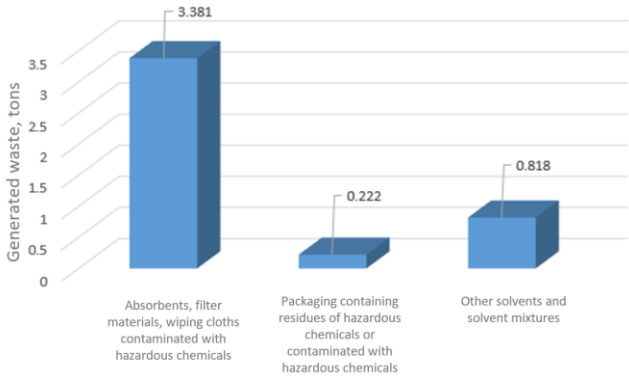

Figure 1. Graphical representation of total quantities of hazardous waste for 2020.

1) Absorbents, filter materials, wiping cloths contaminated with hazardous chemicals – 3,381 tons;
2) Packaging containing residues of hazardous chemicals or contaminated with hazardous chemicals – 0.222 tons;
3) Other solvents and solvent mixtures – 0.818 tons

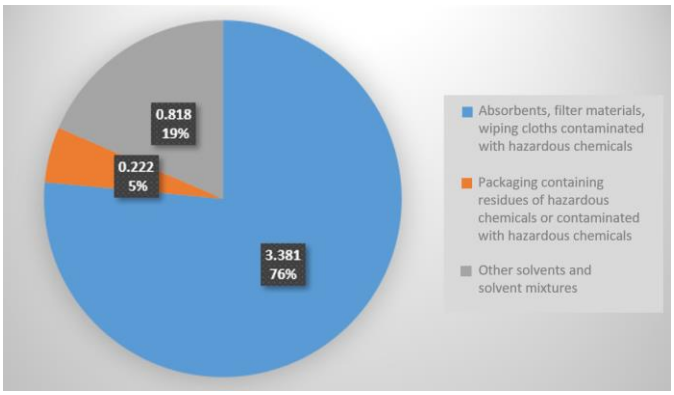

Figure 2. Percentage ratio of total hazardous waste quantities for 2020

Summarized quantities of hazardous waste for 2021 - graphical representation

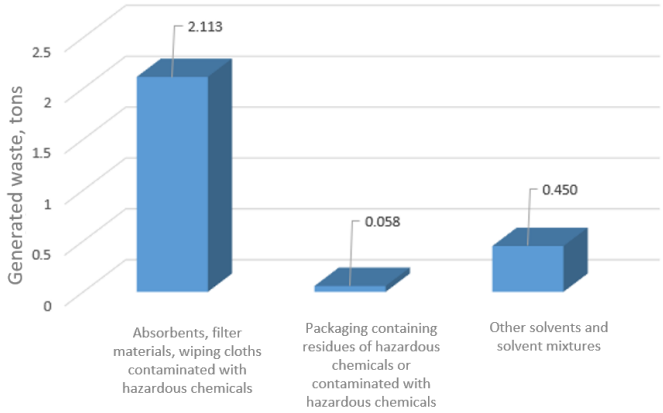

Figure 3. Graphical representation of total quantities of hazardous waste for 2021.

1) Absorbents, filter materials, wiping cloths contaminated with hazardous chemicals – 2,113 tons;
2) Packaging containing residues of hazardous chemicals or contaminated with hazardous chemicals – 0.058 tons;
3) Other solvents and solvent mixtures – 0.450 tons.

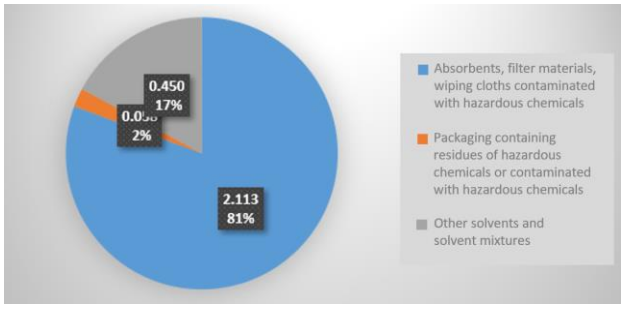

Figure 4. Percentage ratio of total hazardous waste quantities for 2021

From the results obtained for the analysis of the generated waste for 2020 and 2021, it is clear that the Hazardous Waste generated for 2021 is almost two times less than the Hazardous Waste generated for 2020, or 1.8 tons less Hazardous Waste. On the other hand, there is monitoring of the consumption of energy resources through an automated monitoring system. The legal requirements for storage and loading and unloading activities of hazardous chemicals and hazardous waste are complied with.

Figure 5. Comparison of total quantities of hazardous waste generated for 2020 and 2021.

III. CONCLUSION

- Waste identification along technological lines helps to improve waste management and minimize it.
- Periodic training is conducted with employees at all levels, which aims to familiarize them with the rules for waste collection and compliance with all regulations.
- Energy resource consumption is monitored through an automated monitoring system.
- Energy sources are reused.
- A reduction in electricity and natural gas consumption per unit of product produced is observed.
- The process has been optimized and waste heat from production lines has been utilized.
- A reduction in nitrogen consumption per unit of product produced has been achieved.
- Compliance with legal requirements for storage and loading and unloading of hazardous waste and hazardous waste.
- Continuous maintenance of aspiration systems and monitoring of air emissions is carried out.

In the modern world, waste represents both an environmental and a social and economic problem.

Rapid industrialization, increasing consumption and consumer behavior of society continue to produce large amounts of waste. The reality is that large and diverse efforts are needed to prevent its formation. Waste represents both a loss of material resources and, at the same time, has potential as an energy source. The challenge of dealing with the waste problem is great.

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2. Ministry of Environment, Water and Environment, National Waste Management Program 2014-2020

3. Regulation No. 2 of July 23, 2014 on the classification of waste, issued by the Minister of Environment and Water and the Minister of Health (published in the State Gazette, issue 66 of 08.08.2014)