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## The World Inventory of Historical Scientific Instruments – The Polish Contribution

The article is devoted to a project carried out after the Second World War by historians of science whose aim was to explore the world heritage of historical scientific instruments. The article presents the results of research whose purpose was to learn the methods of implementation and the results of compiling an inventory of historical scientific instruments preserved in Poland after World War II.

The *Commission pour l'inventaire mondial des appareils scientifiques d'intérêt historique* (the Commission for the World Inventory of Scientific Instruments) was founded in 1956 at the International Union of History and Philosophy of Science in Paris – the Division of the History of Science. The aim of the Commission was to coordinate work on the implementation of a world inventory of historical scientific instruments. The concept of the inventory card was prepared, and the criteria for the selection of historical instruments for the inventory and deadlines for the project were set. Members from at least 29 countries participated in the works of the Commission. The project was implemented by European science and technology museums and national academies of sciences. The collected data was recorded on index cards which were prepared, among others, by French, Italian, Belgian, Czech, and Polish researchers. A Russian catalogue was published. In Poland in 1959–1963, work on the inventory was conducted by the Department of History of Science and Technology of the Polish Academy of Sciences. Queries were commissioned to Tadeusz Przykowski, a science historian, collector, and expert on gnomonics. For the world inventory, he selected about one hundred of the most valuable science objects from the collections of Polish museums and other institutions. Nearly 20% of those were gnomonic objects, the remaining part consisted of astronomical instruments, pharmacy instruments and individual objects pertaining to other fields of science. Works on the national inventory of historical scientific instruments were also carried out under the guidance of Przykowski. The preserved documents do not allow us to determine at what stage these works stopped. Currently, the project 'National inventory of historical scientific instruments' is being implemented at the L. & A. Birkenmajer Institute for the History of Science of the Polish Academy of Sciences. It aims to create an electronic database of historical scientific instruments which have been preserved in Polish museums. The project has been financed by the National Science Centre Poland (Research project: OPUS 13 No. 2017/25/B/HS3/01829).

**Keywords:** historical scientific instruments, world inventory of scientific instruments, Polish collections of scientific instruments, Tadeusz Przyrkowski, the National Science Center Poland

**Słowa kluczowe:** historyczne przyrządy naukowe, zbiory muzealne, światowy inwentarz instrumentów naukowych, polskie kolekcje instrumentów naukowych, Tadeusz Przyrkowski, Narodowe Centrum Nauki Polska

## Research goals

This article was inspired by two research aims. The first goal was to show how the concept of a global inventory of historical scientific instruments was born and developed. Answers to these questions were obtained mainly through the analysis of official documents of the International Union of History and Philosophy of Science and articles in Polish journals, as well as archival materials. The second research goal, particularly important for the Polish *milieu* of science historians, was to find whether and how Polish researchers joined in documenting the world heritage of scientific instruments.

The preserved archival material was the source material for investigating these issues. The most valuable pieces are in the Przyrkowski Museum in Jędrzejów and in The Science Museum's Dana Research Centre and Library in London.

## Introduction: scientific instruments as science artifacts

In the history of the practice of science, researchers' tools were perceived only as items necessary to conduct scientific research. These earliest instruments, which were often high-class works of artistic craft, were mostly related to astronomy and various forms of measurement and are historically referred to as 'mathematical' instruments. The instruments – richly decorated and often made of noble materials, until practically the eighteenth century – were produced with great care in terms of their artistic properties. With the development of experimental sciences, together with the new approach to the study of Nature through experience, a new group of scientific instruments was created, mainly in the second half of the seventeenth century through the eighteenth century. New research and teaching instruments that described the philosophy of nature were called 'philosophical' instruments. At the same time, scientific instruments evolved, and indeed are still evolving. In the nineteenth century, their artistic aspect gave way to the accuracy and precision of measurements, broader cognitive possibilities, and convenience of use. Noble materials such as ebony, silver, and ivory (which were still used until the eighteenth century) were replaced with oak wood, brass, and newly created metal alloys. Innovations in the construction and design of instruments were systematically introduced. Measuring instruments were designed to record known phenomena or cause other desirable phenomena. The design of the instruments evolved into the form of today's 'gray boxes'.

Attempts at understanding the process of evolution of research instruments and interest in this process date back to the early twentieth century. In May 1925 in the Old Ashmolean Building in Oxford, the Lewis Evans (1853–1930) collections of books and

historical instruments, mainly astronomical, were publicly presented.<sup>1</sup> They drew the attention of historians of science to the historical, scientific, and material importance of these objects.

### World inventory of historical scientific instruments – beginnings

Soon after WWII, in 1946 André Lèveillé (1880–1962), director of Le Palais de la Découverte in Paris, proposed cataloguing the world's most valuable historical scientific instruments.<sup>2</sup> Practical activities took place ten years later, when in the structure of the International Union of History and Philosophy of Science in Paris, in the Division of the History of Science, the *Commission pour l'inventaire mondial des appareils scientifiques d'intérêt historique* (the Commission for the World Inventory of Scientific Instruments) was created.<sup>3</sup> Under the aegis and with the financial support of UNESCO, the Commission started work on the implementation of national inventories of historical scientific instruments. The agreement between the Union of History and Philosophy of Science and UNESCO for the financing of inventory by UNESCO was signed on December 23, 1957, after the decisions taken in New Delhi at the General Assembly of UNESCO in 1956.<sup>4</sup> The Commission worked under the leadership of André Lèveillé. A few historians of science, technology and scientific instruments were involved in the creation of the inventory concept: vice-chairman of the Commission – Henri Michel (1885–1981), Francis Madison (1901–1993), Maurice Dumas (1910–1984) and American researchers: I. Bernard Cohen (1914–2003), Derek de Solla Price (1922–1983), and Silvio A. Bedini (1917–2007).<sup>5</sup> Tadeusz Przyrkowski<sup>6</sup> (1905–1977), a historian of science and art, a collector, and expert on gnomonics, was the representative of the Polish side involved in the work on the inventory.

The matter of the inventory of artifacts of science and technology was also brought up in the circle of museum professionals associated in the International Council of Museums (ICOM). In November 1946, the Committee of Museums of the History of Science and Technology was established at the ICOM Congress in Paris.<sup>7</sup> At the next congress

- 1 P. de Clercq, Lewis Evans and the White City Exhibitions, "Sphaera" Issue 11, 2000, Museum of the History of Science, Oxford [www.mhs.ox.ac.uk/sphaera/index.htm?issue11/artic14](http://www.mhs.ox.ac.uk/sphaera/index.htm?issue11/artic14) [accessed 12.03.2019]. J. Holland, *Scientific Instrument Collection in Australia Universities*, members.optusnet.com.au/jph8524/JHUnInstColl.htm [accessed 12.03.2019].
- 2 R. Anderson, *National Inventory of Scientific Instruments and the British Contribution*, "Bulletin of the Scientific Instrument Society" no 4, 1984, p. 9–11.
- 3 Official address of the Secretariat of the Commission: Biblioteca Leonardiana di Vinci, Firenze, Italy.
- 4 ARP, *Folder Sprawy katalogu przyrządów naukowych. Rok 1960. Listy Tadeusza i fotografie przyrządów naukowych* (folder: *The matters of the catalogue of scientific instruments. 1960. Tadeusz's letters and photographs of scientific instruments*), *Organizacja prac nad inwentarzem zabytkowych przyrządów naukowych na terenie Polski* (*Organization of works on the inventory of historical scientific instruments in Poland*), undated, after 18.10.1961; R. Anderson, op. cit., p. 9; E.-H. Guitard, *Un fichier des instruments scientifiques anciens*, "Revue d'Histoire de la Pharmacie" vol 47, 1959, no 163, p. 197–198.
- 5 S.J. Schechner, *Instrumentation*, [in:] "Companion to the History of American Science", ed. by G.M. Montgomery, M.A. Largent, Chichester 2015, p. 412.
- 6 E. Rybka, *Tadeusz Przyrkowski (1905-1977)*, "Kwartalnik Historii Nauki i Techniki" vol. 23, 1978, no 3–4, p. 759–767; ARP sig. B. 3636, T. Przyrkowski, *Autobiografia* (*Tadeusz Przyrkowski's Autobiography*), undated typescript.
- 7 Resolutions adopted by ICOM Constitutive Assembly, Paris, France, 1946, [icom.museum/wp-content/uploads/2018/07/ICOMs-Resolutions\\_1946\\_Eng.pdf](http://icom.museum/wp-content/uploads/2018/07/ICOMs-Resolutions_1946_Eng.pdf) [accessed 12.03.2019].

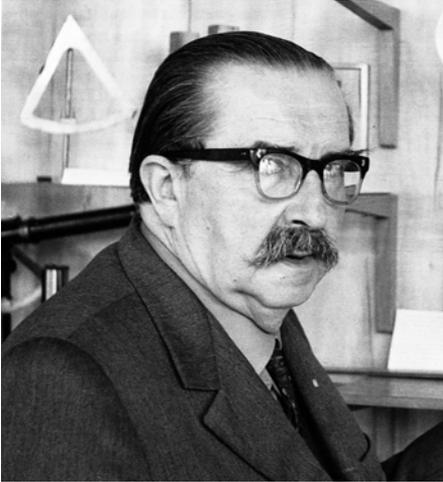


Fig. 1. Tadeusz Przyrkowski; photo by Piotr M. Przyrkowski [pl.wikipedia.org/wiki/Plik:Tadeusz\\_Przyrkowski,\\_J%C4%99drzej%C3%B3w.jpg](http://pl.wikipedia.org/wiki/Plik:Tadeusz_Przyrkowski,_J%C4%99drzej%C3%B3w.jpg) [accessed 12.03.2019].

in August 1950 in London, a resolution was passed according to which the Committee of Museums of the History of Science and Technology would prepare a list of the most important historical scientific instruments preserved in public museums, private collections and other repositories (Resolution No. 10: List of Scientific Instruments, 2<sup>nd</sup> Biennial General Conference and 3<sup>rd</sup> General Assembly of ICOM, London, United Kingdom, 17–22 July 1950).<sup>8</sup> At the ICOM Congress in Milan (1953), the funds for the development and publication of a list of instruments were deemed insufficient (Resolution No. 13). Before the ICOM Congress in Geneva in August 1956, the meeting of the Chairman of the Committee of Museums of the History of Science and Technology ICOM with the International Union of History and Philosophy

of Science took place. The result was the Union's agreement to work on the inventory with financial support from UNESCO (Motion No. 2: International Inventory of Historical Scientific Apparatus, 4<sup>th</sup> General Conference and 5<sup>th</sup> General Assembly of ICOM, Geneva, Switzerland, 9 July 1956).<sup>9</sup> Further work was carried out outside the ICOM structures, although the question of developing catalogues of instruments in a broader sense, as well as the unification of the nomenclature, appeared in the ICOM provisions in Munich in 1968 (Resolution No. 4: Directories, Inventories). The following recommendations were given in the resolution:<sup>10</sup>

Having received a joint request from several of its International Committees, Recalling the recommendations adopted by various previous General Assemblies and the activity of the UNESCO-ICOM Museum Documentation Centre since its creation, Recommends that ICOM National Committees, in liaison with museums associations and scientific organizations covering various disciplines, should start to prepare for publication museological terminologies, national directories of museums in these disciplines, and scientific inventories of collections, based on standardized rules in accordance with the needs of research, as a first step towards the preparation of international directories and inventories, to be undertaken by the ICOM Committees at a later date.

8 Resolutions adopted by ICOM's 3<sup>rd</sup> General Assembly, London, United Kingdom, 1950, [icom.museum/wp-content/uploads/2018/07/ICOMs-Resolutions\\_1950\\_Eng.pdf](http://icom.museum/wp-content/uploads/2018/07/ICOMs-Resolutions_1950_Eng.pdf) [accessed 12.03.2019].

9 Resolutions adopted by ICOM's 5<sup>th</sup> General Assembly, Geneva, Switzerland, 1956, [icom.museum/wp-content/uploads/2018/07/ICOMs-Resolutions\\_1956\\_Eng.pdf](http://icom.museum/wp-content/uploads/2018/07/ICOMs-Resolutions_1956_Eng.pdf) [accessed 12.03.2019].

10 Resolutions adopted by ICOM's 9<sup>th</sup> General Assembly, Munich, Germany, 1968, [icom.museum/wp-content/uploads/2018/07/ICOMs-Resolutions\\_1968\\_Eng.pdf](http://icom.museum/wp-content/uploads/2018/07/ICOMs-Resolutions_1968_Eng.pdf) [accessed 12.03.2019].

The members of the Commission for the World Inventory of Scientific Instruments met annually in this period. In June 1960, the meeting took place in Brussels;<sup>11</sup> in 1961, its fourth meeting took place in Paris in the UNESCO building. André Lèveillé chaired the Commission. The Union of History and Philosophy of Science was represented by its General Secretary, René Taton (1915–2004). Tadeusz Przyrkowski attended the meeting as a representative of the Department of History of Science of the Polish Academy of Sciences.<sup>12</sup> It was determined at the meeting that a longer period was needed to work on the global inventory. An editorial committee was established for the inventory, which also included Tadeusz Przyrkowski.<sup>13</sup> In 1962, at the 10<sup>th</sup> International Congress of the History of Science in the United States, the meeting of the Commission was chaired by Prof. Bogdan Suchodolski (1903–1992). The method of conducting the work was discussed; it was suggested that national committees of the history of science should be involved in the work on the inventory. Interestingly, the Russian Academy of Sciences proposed creating a subcommittee in Moscow for East European countries that were not part of UNESCO.<sup>14</sup>

The meeting of the Commission, planned for January 1963 in Paris, was postponed due to the death of chairman, André Lèveillé in December 1962. Instead, the members met in Brussels on May 13–14, 1963.<sup>15</sup> The role of the chairman was taken by Henri Michel.

The importance of work on the inventory of historical scientific instruments is evidenced by the fact that so many countries participated in the project. In 1961 in Paris, representatives of 29 countries reported the results of their work.<sup>16</sup> At the meeting of the Commission in Warsaw in 1965, at the 11<sup>th</sup> International Congress of the History of Science, representatives of Austria, Czechoslovakia, Spain, the Netherlands, France, Luxembourg, the German Democratic Republic, Germany, Poland, Portugal, the United States, Switzerland, Sweden, Tunisia, Great Britain, Italy, and the USSR participated in the Commission of the World Inventory of Scientific Instruments.<sup>17</sup>

11 ARP, Folder *Sprawy katalogu*, H. Michel's letter to T. Przyrkowski of 9.06.1960 regarding the meeting in Brussels.

12 H. Michel did not come to the meeting of the Commission in Paris due to illness; the chairman of the International Union of History and Philosophy of Science, V. Ronchi, also did not attend because of a railway strike. T. Przyrkowski, *Posiedzenie Komisji Światowego Inwentarza Zabytkowych Przyrządów Naukowych w Paryżu*, "Kwartalnik Historii Nauki i Techniki" vol. 7, 1962, no 1–2, p. 230–231.

13 T. Przyrkowski, *Posiedzenie*, p. 230–231.

14 Collective work of the Polish delegation to the Congress, *Kronika no. 11. Światowy Inwentarz Historycznych Przyrządów Naukowych*, (*Chronicle no. 11. World Inventory of Historical Scientific Instruments*) "Kwartalnik Historii Nauki i Techniki" vol. 8, 1963, no 1, p. 139. The delegation included Prof. B. Suchodolski, Prof. Wł. Hübicki, Prof. E. Olszewski, Dr. W. Woisé, and Tadeusz Przyrkowski, who was then in the USA.

15 T. Przyrkowski, *Posiedzenie Międzynarodowej Komisji Inwentarza Zabytkowych Przyrządów Naukowych*, (*Meeting of the International Commission of World Inventory of Scientific Instruments*), "Kwartalnik Historii Nauki i Techniki" vol. 8, 1963, no 4, p. 621–622.

16 T. Przyrkowski, *Posiedzenie Komisji Światowego Inwentarza Zabytkowych Przyrządów Naukowych w Paryżu*.

17 D. Rederowa, *Kronika zagraniczna. Zgromadzenie Ogólne Sekcji Historii Nauki Międzynarodowej Unii Historii i Filozofii Nauki* (*Foreign Chronicle. General Assembly of the Section of the History of Science of International Union of History and Philosophy of Science*), "Kwartalnik Historii Nauki i Techniki" vol. 11, 1966, no 1–2, p. 189.

## Inventory concept

On 23 June 1958 in Paris, the Commission developed a draft inventory card. Its author was Henri Michel and, as Przypkowski wrote, this project coincided with his own, which he brought to the meeting.<sup>18</sup> It was established that it was necessary to attach photographic documentation to the card.

One of the major problems widely discussed by the Commission at its subsequent meetings was the development of a common opinion defining the criteria for selecting objects for the inventory. According to H. Michel, objects with significant historical and artistic value, those related to eminent scholars, and those that marked the stages of science development over the centuries, should be entered into the inventory.<sup>19</sup> This meant that it was not the goal of the Commission to include all the individual countries' objects. This problem was raised at subsequent meetings of the Commission. Tadeusz Przypkowski, when reporting progress on the global inventory, discussed different views on this issue. According to Przypkowski, it was suggested that the artistic and scientific values of each instrument should be taken into account, even if this instrument was not associated with an eminent scholar.

A concept for documentation of all instruments whose design or utility were associated with certain scientific reasons was also proposed. The description of objects in the form of fiches was accepted unreservedly.

Twenty-seven categories were identified in which the instruments should be catalogued. These were: mathematics, metrology, topography and geodesy (together), geography, navigation, astronomy, meteorology, gnomonics, chronometry, mechanics, optics, acoustics, thermophysics, atomic physics, electricity and magnetism (together), chemistry, pharmacy, biology, zoology, botany, geology and geophysics (together), mineralogy, paleontology, physiology, medicine, anatomy, and surgery.

The inventory work began just after the establishment of the Commission. Firstly a two-volume Belgian catalogue in the form of fiches was prepared: the first volume was completed in 1959 and the second in 1960 (236 entries in total).<sup>20</sup> Next came a five-volume inventory of instruments developed in Italy in 1963 (693 entries) and a year later a French inventory (135 entries).<sup>21</sup> The only Russian inventory was published in the form of a book by Leonid Efimowich Maistrov.<sup>22</sup> It contains descriptions of 1,333 items, 272 black and white photographs, and an extensive bibliography.

18 ARP, T. Przypkowski, *Sprawozdanie z podróży naukowych latem 1958 roku dr. Tadeusza Przypkowskiego z Jędrzejowa*, (Report on scientific journeys in the summer of 1958 by Dr. Tadeusz Przypkowski from Jędrzejów), undated typescript, p. 11. During the Committee meeting, T. Przypkowski ordered 500 copies of cards for the needs of the inventory of Polish objects. In the *Report*, Przypkowski stated that he had contacted the Korean Academy of Sciences in Pyongyang, which had agreed to participate in the work on the world inventory. Further reports no longer contain information about the results of this initiative.

19 R. Anderson, op. cit., p. 9; Przypkowski, book review: Silvo A. Bedini, *Early American Instruments and Their Makers*, "Kwartalnik Historii Nauki i Techniki" vol. 11, 1966, no 3, p. 276. The discussion was also held at the 11<sup>th</sup> Congress of the History of Science in Warsaw in 1965, (D. Rederowa, op. cit., p. 189).

20 R. Anderson, op. cit., p. 9–11; M. Holbrook, *Science Preserved*, London 1992, p. 14.

21 A critical comment by Gerard L'Estrange Turner, an outstanding historian of scientific instruments, on some inventories, quoted in R. Anderson, op. cit., p. 9.

22 L.E. Maistrov, *Nauchnye pribory. Pribory i instrumenty istoricheskogo znacheniya*, Moskva 1968.

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**UNION INTERNATIONALE D'HISTOIRE ET PHILOSOPHIE DES SCIENCES**  
 Division d'Histoire des Sciences  
 COMMISSION POUR L'INVENTAIRE MONDIAL DES APPAREILS SCIENTIFIQUES D'INTÉRÊT HISTORIQUE  
 Secrétariat : BIBLIOTECA LEONARDIANA - VINCI-FIRENZE - ITALIA

FICHE D'INVENTAIRE

Date de l'inventaire IV.1960

1) Auteur de la présente fiche Dr. J. Dobryniecka

2) Catégorie PHYSIQUE Sous-catégorie Pompe pneumathique.

3) Nature de l'objet inventorié Pompe pneumatique.

4) Lieu de dépôt à la date ci-dessus Kraków, Université.

5) N° d'inventaire dans ce dépôt 186, A.

6) Provenance Acquisé par cabinet physique de l'Université en 1780.

7) Dimensions H:

8) Matière et particularités Bois et laiton.

9) Signature, initiales, date et lieu de construction indiqués sur l'objet

10) Constructeur et date présumés  
Vast à Paris en 1758 année.

11) Inventeur et modificateur Abbé Nollet.

12) Etat de conservation Bon, manque cloche en verre.

13) Bibliographie spéciale à l'objet J. Rogaliński. Doświadczenia skutków rzeczy. 1765.

14) Photographie N°

15) Observations diverses En l'inventaire de 1784 instrument possédait une carte avec l'inscription: Vast fecit Parisiis - Fait à l'otel de joyeuse rue St.Louis place royale en 1758.

14

Fig. 2. A French version of the inventory card of a vacuum pump (France, 1758). The object comes from the collection of Jagiellonian University in Krakow. Card prepared by Janina Dobrzeniecka, ARP; photo by Ewa Wyka.

Two countries from Central Europe – Poland and Czechoslovakia – also contributed. Their inventories were made in the form of inventory cards, respectively in the years 1960–1963 and 1970.<sup>23</sup> The inventory of instruments selected from the Czech collections comprised 116 items. These were instruments classified mainly in the following categories:

23 M. Holbrook, p. 11; Anderson, op. cit., p. 10.; SML microfilm nr B28, undated: *Union internationale d'histoire et philosophie des sciences, Commission pour l'inventaire mondial des appareils scientifiques d'interet historique. Polish national inventory of scientific instruments.*

mathematics, topography, gnomonics, astronomy, metrology, electricity and magnetism, pharmacy, and medicine.<sup>24</sup> Of these, fourteen were very high-quality instruments by the prominent maker Erasmus Habermel (1538–1606). The description of Polish fiches is the subject of the next section of the article.

### The procedure for compiling the Polish inventory

Cataloguing work in individual countries took a long time. The final date for the transfer of national inventory materials, as indicated by the Commission and UNESCO, was July 1960. After postponing the deadline, chairman A. Léveillé expected them to be completed by October 30, 1960.<sup>25</sup> The Polish Committee set a deadline for national institutions to submit notes by mid-March 1960.<sup>26</sup>

According to the Commission's decision, national academies of sciences should be responsible for the work on inventories. In Western European countries, museums of science and technology (if there were any) were fundamentally engaged in preparing the inventory. In post-war Poland after the late 1950s, there were virtually no museums of such profile, except for the Museum of Technology in Warsaw.<sup>27</sup> The Adrian Baraniecki Museum of Technology and Industry in Krakow, which had held a rich collection of scientific and technical facilities, was already closed (1951), and the Jagiellonian University Museum in Krakow was in the process of assembling a collection of scientific instruments. Work on the inventory was undertaken by the Department of History of Science of the Polish Academy of Sciences in Warsaw, where a special department for this purpose was created. The initial UNESCO subsidy for Poland was \$50.<sup>28</sup> In 1958, André Léveillé, the then-chairman of the Commission, came to Warsaw. During the visit, the final organizational and financial conditions for the project's implementation were established. Tadeusz Przykowski was the person responsible for the Polish inventory.<sup>29</sup>

On February 5, 1959, at the meeting of the Technical Monuments Committee of the Scientific Council of the Museum of Technology in Warsaw, Prof. Jan Pazdur<sup>30</sup> (1909–2001) read a letter from the Polish Academy of Sciences addressed to this museum. The letter contained a proposal for cooperation on the inventory of scientific heritage. It also informed about the research concerning the inventory that was being carried out by the Committee of the History of Science and Technology of the Polish Academy of Sciences.<sup>31</sup>

24 SML, microstrip, *Contribution tchecoslovaque à l'inventaire*, 1970.

25 ARP, Folder *Sprawy katalogu* (Folder *Catalogue matters*), Victor Kovda's letter of 17.12.1959 to the Director of the Natural Sciences Department UNESCO, no. NS/ISO – 877.236.

26 ARP, Folder *Sprawy katalogu*, letter no. KHN 45/60 of the History of Science Committee to the Arkadia Museum in Nieborów dated 25.01.1960.

27 The owner of the Museum of Technology in Warsaw was *Naczelna Organizacja Techniczna* (NOT, the Polish Federation of Engineering Associations).

28 ARP, T. Przykowski, *Organizacja prac*, p. 2; ARP, Folder *Sprawy katalogu*, letter nr 1744 AL.GP from A. Léveillé to Prof. Suchodolski on the subsidy for the inventory of 12.05.1959, Paris.

29 ARP, Folder *Sprawy katalogu*, letter from ZHNI PAN no. 139/60 on 28 February 1960 to Tadeusz Przykowski, regarding the commissioning of works on the inventory; Contract No. 149/61 between ZHNI and T. Przykowski for the execution of 12 inventory cards.

30 J. Jadach, *Jan Pazdur (1909–2001)*, "Studia Pedagogiczne. Problemy Społeczne, Edukacyjne i Artystyczne" vol. 14, 2003, p. 327–329.

31 ARP, Folder *Sprawy katalogu*, Report from the Meeting of the Technical Monuments Committee of the Scien-

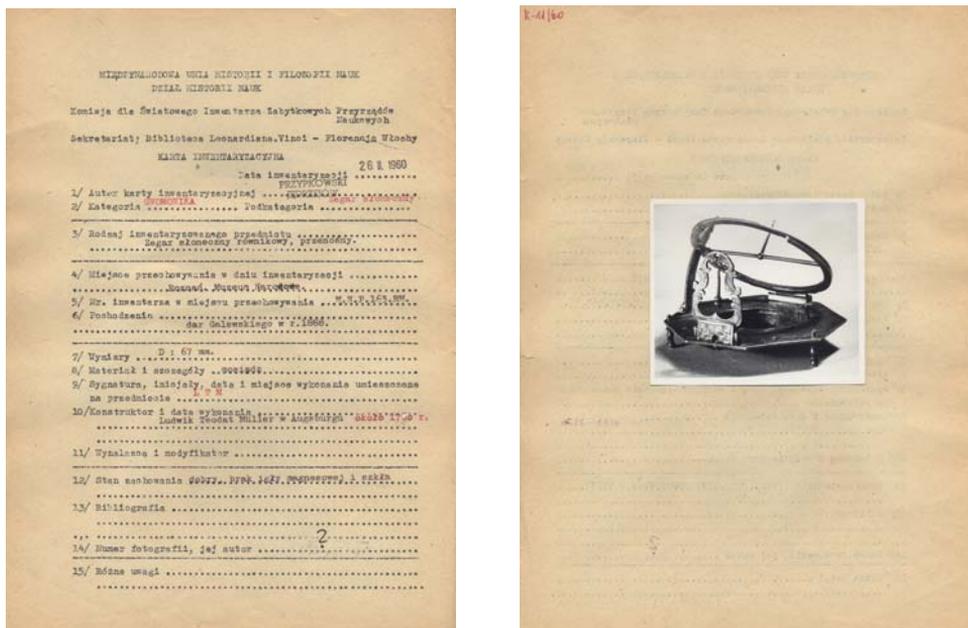


Fig. 3. Polish-language inventory card of a sundial (L.T. Müller, Augsburg, ca. 1760). The object comes from the collection of the National Museum in Poznań; photo on the reverse of the card, ARP; photo by Ewa Wyka.

As can be seen from further correspondence, the proposed cooperation was accepted by the Museum. At the end of 1959 (November–December), on behalf of the Committee of the History of Science and Technology of the Polish Academy of Sciences, together with the Museum of Technology, letters were sent ‘in a few hundred copies to all rectors of universities, scientific societies and all museums in the country’.<sup>32</sup> The preserved documentation in this area does not reflect all of the work done. The list of institutions to which inquiries were sent in 1960 comprised 29 colleges and research institutes, 6 scientific societies, and 119 museums.<sup>33</sup> The French inventory card and instructions on how to fill it with data was translated into Polish by T. Przykowski. The working concept of the inventory assumed collecting completed inventory cards of instruments that would form a Polish inventory, from which the most valuable items would be chosen according to the criteria indicated by the Commission. The French versions of the cards were the Polish contribution to the world inventory.

The information came quickly from institutions that did not have the sought objects. Other institutions that held historical instruments, such as the National Museum in Warsaw, were asked to provide 30 completed inventory cards each. The National Museum in

tific Council of the Museum of Technology of 5.02.1959 in Warsaw. The commission asked T. Przykowski to consider the proposals and to submit the proposals regarding the Museum’s participation in the inventory.

32 ARP, T. Przykowski, *Organizacja prac*, p. 3. The ARP retained a dozen responses to the query sent; J. Pietrusiński, *Komunikat*, “Ochrona Zabytków” vol. 13, 1960, no 1–4, p. 99.

33 ARP, Folder *Sprawy katalogu*, a handwritten list of institutions with notes by Przykowski.

Krakow proposed extending the deadline for the implementation of cards by one year, i.e. until January 1, 1961, while the Jagiellonian University asked for a more detailed explanation of the inventory.<sup>34</sup>

Tadeusz Przykowski actively participated in the work on the register, as is shown by his correspondence and reports. He visited museums and institutions to study their scientific instruments. He also travelled abroad to consult and to report progress to Paris (1958, 1961) Munich (1958), Moscow (1958), Prague (1959), Oxford (1961), Vienna (1960), Dresden (1961), London (1961), and Brussels (1961).<sup>35</sup> On October 18, 1961 in Paris, he submitted the Polish contribution to the world inventory in the form of eighty-eight instrument cards along with their photographic documentation.<sup>36</sup> The surviving documents give information on the transfer of ninety-nine cards,<sup>37</sup> therefore it can be assumed that the inventory was supplemented over time.

### Description of the Polish inventory

Despite the efforts made, no copies of the inventory cards sent by Przykowski have been found in the Polish archives. The originals are most likely in the Biblioteca Leonardi-ana di Vinci in Florence, but even there it turned out to be difficult to view them. The available source of information about the Polish contribution to the inventory is an undated microfilm, stored with a microstrip of the Czech inventory at the Science Museum Library in London under the reference Microfilm B.28. It contains photographs of ninety-nine French-language inventory cards for instruments and instrument collections in Polish resources.<sup>38</sup> The microfilm was made at *Pracownia Reprograficzna Ośrodka Dokumentacji i Informacji Naukowej Polskiej Akademii Nauk w Warszawie* (the Reprographic Workshop of the Centre for Documentation and Scientific Information of the Polish Academy of Sciences in Warsaw), 72 Nowy Świat Street. It must have been made after 1963, because some of the cards bear this date.

Three thematic collections of instruments were collectively included in the Polish scientific heritage by Przykowski: a collection of instruments and metrological standards of *Centralne Biuro Miar* (Central Bureau of Measures in Warsaw), today's *Główny Urząd Miar* (GUM) (Central Office of Measures); a collection of pharmaceutical utensils and instruments belonging to *Muzeum Historii Farmacji* (the Museum of Pharmacy History) in Krakow (now the Museum of Pharmacy of the Jagiellonian University); and the Przykowski family gnomonic collection in Jędrzejów.<sup>39</sup> Tadeusz Przykowski chose the most valuable items from each of these three collections to inventory them separately. He

34 ARP, Folder *Sprawy katalogu*, a letter from the Rector of the Jagiellonian University Stefan Grzybowski to KHN PAN, No. 26/104/19/60, dated December 14, 1959, sent as a response to the letter from KHN No. 531/59; answer of KHN Edward Olszewski, no. 1/60; January 1960 no date; letter from Karol Estreicher to KHN No. 16/60 on 25.02.1960, No. ZHNIT 165/60.

35 T. Przykowski, *Organizacja prac*, p. 3–4.

36 *Ibid.*, p. 5.

37 See SML, microfilm B.28.

38 Cards were translated from Polish to French by Tadeusz Przykowski.

39 This private collection was donated to the state by the Przykowski family and transformed into the National Przykowski Museum in Jędrzejów in 1962.



Fig. 4. A standard volume-measuring instrument dated 1764 and signed 'City Hall of Warsaw', Warsaw, 1764; this object was qualified by Tadeusz Przykowski for the world inventory of historical scientific instruments, GUM (Central Office of Measures), no. GUM 016-003409, contemporary photograph; photo by Kaja Drąg.

submitted four items from the Central Bureau of Measures to the world inventory. Their inventory cards were elaborated by Andrzej Janiszek (1905–1998), a longtime curator of metrological collections at GUM. These were: a four-pound nested cup dated 17<sup>th</sup>–18<sup>th</sup> century, a six-pound weight dated 1677, a standard volume-measuring instrument dated 1764 and signed the 'City Hall of Warsaw', and a set of fifty-four steel matrices of standard measures from various countries from the mid-nineteenth century.<sup>40</sup>

However, some other important instruments from GUM were not introduced into the world inventory, such as a 'New-Polish' control elbow made after 1818, that is, after the introduction of the New Polish Measures system based on the metric system. Also, Przykowski did not include some other important pieces of apparatus: for example, an apparatus for broadcasting radio time signals (1954).<sup>41</sup>

Inventory cards for twelve objects were sent for the collection of what was then the Museum of Pharmacy History. The cards were created by Dr. Stanisław Proń (1892–1971), the founder and head of the Museum. These were laboratory utensils, distillation apparatuses, selected microscopes, a barometer, and pharmacy mortars from the 16<sup>th</sup>–20<sup>th</sup> century. Also, in addition to the ten sundials, twelve more objects for the world inventory were chosen by Przykowski from his family collection in Jędrzejów: two models made 'in the Przykowski workshop', i.e. an instrument for observing almucantar passages (1938) and another sundial (1942). At that time, they were recommended by The Ministry of Education for schools.

40 A set of steel matrices was donated to the GUM collection by *Wytwórnia Miar Długości* in Mieszkowice near Szczecin; SML, card numbers: 66–69.

41 There is an annotation in the inventory card of the device for broadcasting radio time signals which reads as follows: 'Registered in the Department of History of Science of the Polish Academy of Sciences and UNESCO in Paris 1961' (The scientific catalogue, GUM), but its card is not listed in the microfilm discussed.

MUSEUM POLSKA WIELA HISTORIA I PRZYSZŁOŚĆ NAUK  
POLSKA HISTORIA NAUK

Kolekcja dla Światowego Inwentarza Zabytkowych Przyrządów  
Museum

Sekretariat: BILB: Leonardianna, Plac - Flakow 3, 00-000

KARTA INWENTARYZACYJNA

Data inwentaryzacji: 22.06.60

PRZYPKOWSKI

1/ Autor karty inwentaryzacyjnej: PRZYPKOWSKI

2/ Kategoria: INSTRUMENTY ..... Politechniki Łódzkiej

3/ Nazwa inwentaryzowanego przedmiotu: .....

4/ Miejsce przechowywania w dniu inwentaryzacji: POLITECHNIKA  
ŁÓDŹ

5/ Nr. inwentarza w miejscu przechowywania: .....

6/ Inwentarz: .....

7/ Wzrosty: .....

8/ Materiał i rozmiar: .....

9/ Wykonanie: .....

10/ Konstrukcja i data wykonania: .....

11/ Wyposażenie i noty: .....

12/ Stan: .....

13/ Inwentarz: .....

14/ Numer inwentarza tej autor: .....

15/ Inne uwagi: .....



Fig. 5. Polish version of an inventory card of a universal sundial ('Dwucień'/'Skiadys') from The Przypkowski Family collection, included in the world inventory; Clock photo on the reverse of the card, ARP; photo by Rafał Zaczkowski (SML, French language card no. 43).

From the Technical Museum in Warsaw, five instruments were selected that were developed by Jerzy Jasiuk, all of which were related to research into radioactivity: three ionization chambers from the late 19<sup>th</sup> century, a piezo-electrometer and an electroscope (Pierre Curie type). They were donated to the Museum by the Curie family. Currently, the instruments are on display at the Maria Skłodowska-Curie Museum in Warsaw. Twenty-nine objects were selected from the historical instruments preserved in Krakow, in addition to the aforementioned objects from the Museum of Pharmacy. Four of them came from the collection of the Czarotoryski Museum: a gothic astrolabe and three compasses. The next two instruments were from the collection of the Historical Museum (now Museum of Krakow): a 17<sup>th</sup>-century Polish elbow and a silver locomotive model from 1859. A table for observing the solar almucantar from the church of St. Florian in Krakow and a sundial (Germany, 1575) from the National Museum in Krakow were also included.

Other objects recognized by Przypkowski as Krakow scientific heritage were astronomical and physical instruments belonging to the Jagiellonian University. Even today they are still recognized as the most valuable Polish historical objects of science. Among others, Przypkowski selected a set of three 15<sup>th</sup>-century astronomical instruments that had previously been owned by astronomer Marcin Bylica (1433–1493) from Olkusz (an astrolabe, a torquetum, and a terrestrial globe), three other astrolabes (Cordoba 1054; Brunswick c. 1460; Germany 15<sup>th</sup> century), a chronocinematograph (1954), and an 18<sup>th</sup>-century astronomical quadrant made by Jacques Canivet (?–1774) in Paris. He also included four unique cryogenic apparatuses from the laboratory of chemist Karol Olszewski (1846–1915), co-author of the first liquefaction of oxygen in a static state: two gas liquefiers by K. Olsze-

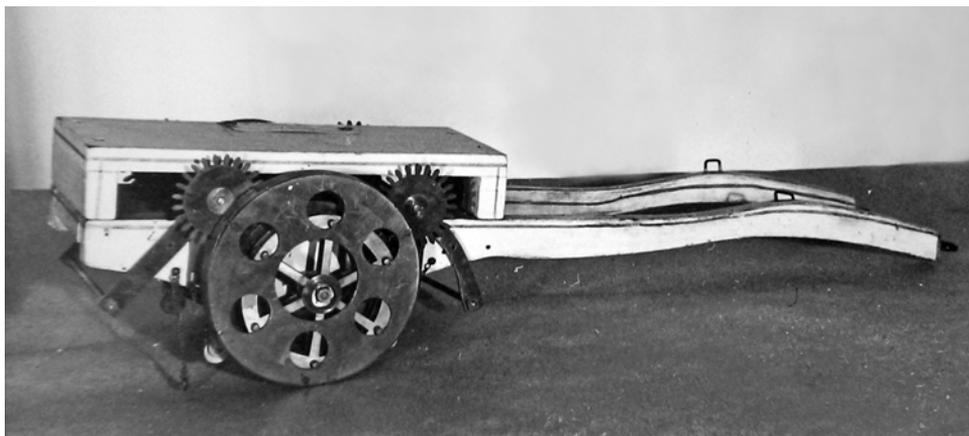


Fig. 6. Photograph described by Tadeusz Przytkowski as a 'model of brass wheels according to Hoene-Wroński, MK 4125', ARP, (SML, card No. 58); photo by Ewa Wyka.

wski dated respectively to 1884 and 1890, a cryostat (Roman Calikowski 1886–1940, 1912) and an apparatus for hydrogen inversion (Karol Olszewski, 1901). Inventory cards for these instruments were made personally by Janina Dobrzyniecka (1910–2007), the curator of the Jagiellonian University Museum at that time. From the collections of the University of Wrocław, Tadeusz Przytkowski introduced to the inventory objects associated with the 18<sup>th</sup>-century Jesuit College in Wrocław: a so-called 'Mathematical Tower', the meridian line in the Tower, which was defined in the inventory card as a 'gnomon expérimental solaire', a proportional compass based on Galileo's design (*Ioannes Macarius Mirandolome Fecit Roma, 1665*) and two gothic astrolabes. Four objects were selected from the collection of the Museum in Toruń: two eighteenth-century compound microscopes, a proportional compass (1638) and an 18<sup>th</sup>-century instrument for measuring angles. In the world inventory, preserved precious fragments of Nicolaus Copernicus's astronomical board that was painted on the wall of the castle in Olsztyn were included. To this day this historical relic is still being researched by conservators and historians of science. Przytkowski also included in the inventory an old Goth cemetery labeled 'Cimetière avec une situation cosmologique'. Known today as the Kamienne Kręgi Reserve (Stone Circles), at Odry near Bory Tucholskie National Park, is a place where the Goths settled in about 70–80 A.D. From the Polish Academy of Sciences Library in Kórnik, objects such as 'brass wheel models, a model of Hoene-Wroński iron wheels' and a proportional compass (1630) were selected.

Other instruments included in the world heritage included an artillery quadrant (1585), an artillery dagger (poignard, Germany, 16<sup>th</sup> century), an artillery diopter instrument used for setting up cannons (signed C.T.D.E.M., 1620) from the collection of the Polish Army Museum in Warsaw, also described by Tadeusz Przytkowski. These instruments are still preserved in the Museum.

Other objects selected as Polish scientific heritage are basically individual ones from other institutions. Among them are vertical sundials placed on the walls of buildings or churches in various cities, for example in the Cathedral in Włocławek, the Municipal Ar-

chives in Gdańsk, the church in Wodzisław, Radziwiłł Palace in Nieborów, and King Jan III's Palace in Wilanów. It can be assumed that the selection of objects was influenced by Przytkowski's personal interests and gnomonic knowledge. He wrote a letter about the inventory of gnomonic monuments<sup>42</sup> to the secretary of the Committee on the History of Science, Zofia Skubała (1919–1987):

BKMR [Aleksander Birkemajer – E.W.] may be dissatisfied with the fact that there are too many gnomonic artifacts in the global inventory [...] I gave over a dozen of my 298 specimens. [...] I want to register only the most important ones from my list of immovable sundials [on the walls of buildings – E.W.], because the provincial conservators do not have them on their list!!!

The question is whether Przytkowski's selection of objects reflected the development of Polish science. About 13% of them were collector's objects owned by the Przytkowski Family. Nearly 7% of the items classified in the inventory were sundials from the walls of churches and did not have the character of scientific objects. The other items were properly selected, real scientific objects. Most of them were associated with important places for Polish science (Toruń, Krakow, Wrocław) or famous scholars such as Maria Skłodowska-Curie (1867–1934), Karol Olszewski, and Ignacy Łukasiewicz (1822–1882). But when one looks at the list, the lack of a few valuable items can be noticed, such as a mechanical armillary sphere (c. 1510, the Jagiellonian University collection), a unique chemical vessel with the alchemical name of a pelican from one of Krakow's pharmacies (17<sup>th</sup>/18<sup>th</sup> century), physical instruments from the 18<sup>th</sup>-century physical cabinets of the Krakow Academy or Józef Rogaliński's Jesuit Lyceum in Poznań, as well as measuring or medical collections from other museums.

It is not clear, however, whether the material recorded on the studied microfilm was the final version of the Polish contribution to the world inventory. As Tadeusz Przytkowski wrote in his autobiography:<sup>43</sup>

The selection of the most valuable historical scientific instruments in Poland, developed in later years on behalf of the Polish Academy of Sciences on these inventory cards, was presented in the form of a microfilm at the Congress of the History of Science and Technology in 1968 in Paris.

Today, it is difficult to determine what material Przytkowski presented then. Even if it was a later, expanded version of the Polish inventory, the core of the selected objects and the principles for selecting them remained unchanged. Summing up his queries, he claimed that, on the whole, historical scientific resources were recognized.<sup>44</sup>

The overall results of Tadeusz Przytkowski's work have never been published. Also, the Union of History and Philosophy of Science did not issue an entire catalogue of collected data. Re-examining this subject would allow the Polish heritage of science to be looked at from the 21<sup>st</sup>-century perspective.

42 ARP, Folder *Sprawy katalogu*, a draft of T. Przytkowski' letter of 13.09.1960.

43 ARP, idem, *Autobiografia*.

44 ARP, idem, *Organizacja prac*.

## The national inventory of historical scientific instruments – a project implemented and funded by the National Science Centre, Poland

The activities undertaken by the Commission of the World Inventory of Scientific Instruments were the first to take stock of the 'material heritage of science', in the sense of the instrumentation of researchers, educators, and practitioners. This process is continually progressing. The first databases containing information on the collections of historical instruments and instrument makers were created only when the Internet became widely available: for example, Webster's Instrument Makers Database<sup>45</sup> or Scientific Instrument Makers in the Netherlands.<sup>46</sup> Electronic versions of collections of science museums are being created, such as at the Galileo Museum in Florence or the Museum of the History of Science in Oxford.<sup>47</sup> Poland is also planning to join this group by preparing a database of historic instruments stored in museums and selected scientific institutions. Although most of the museum collections in the country have created an electronic museum inventory, they are not publicly available. There is also no comprehensive representation of the resources of scientific instruments in Poland. At the Institute for the History of Science of the Polish Academy of Sciences, work has been undertaken to elaborate these resources. A project under the name 'National inventory of historical scientific instruments', is being implemented and financed by the National Science Centre Poland.<sup>48</sup> It will result in a publicly available database covering most of the historical instruments stored in Polish museums and selected scientific institutions. The implementation of this project will be a complementary new version of the work undertaken by the Department of the History of Science and Technology of the Polish Academy of Sciences in the 1960s.

## Conclusion

Summing up the abovementioned works on the heritage of scientific instruments in Poland, a few observations can be made.

1. First, it is worth noticing that the circle of Polish science historians very quickly joined the work on the global inventory. Warsaw, where the project was formally implemented, was badly damaged by WWII. Despite the fact that many challenges awaited the post-war scientific community, such as the reconstruction of the education and science system, Polish researchers, including museum professionals, joined the European process of documenting scientific heritage.

A significant role of the project leader was played in this process by Tadeusz Przymkowski, a science historian who was well acquainted with scientific heritage in Poland, although he was not strictly a scientific researcher. Noteworthy is not only his activity on

45 [historydb.adlerplanetarium.org/signatures/](http://historydb.adlerplanetarium.org/signatures/) [accessed 12.03.2019].

46 [www.dwc.knaw.nl/biografie/scientific-instrument-makers/?lang=en](http://www.dwc.knaw.nl/biografie/scientific-instrument-makers/?lang=en) [accessed 12.03.2019].

47 [catalogue.museogalileo.it/index/IndexObjectsInAlphabeticalOrder.html](http://catalogue.museogalileo.it/index/IndexObjectsInAlphabeticalOrder.html) [accessed 12.03.2019]; [www.hsm.ox.ac.uk/database](http://www.hsm.ox.ac.uk/database) [accessed 12.03.2019].

48 See funding, below.

the local Polish forum, but also his active participation in international meetings devoted to works on global inventory.

2. The form of the inventory was the subject of long discussions of international museum professionals and experts. The formula of the inventory card included data sufficient to correctly assess the scientific and substantive value of the documented objects. This or similar card template is used in the process of documenting objects in most museums nowadays.

The difficulty in solving the problem was to determine the principles of object selection. It seems that they have not been precisely determined. Therefore, the authors of inventory work in individual countries had more freedom in selecting objects for national inventories. This was important, because it allowed them to include in the inventory instruments of significant value for science and culture of a given country, and not necessarily of the highest museum class.

3. It should be noted that compared to museum and academic collections preserved in Western Europe, Polish scientific collections are rather poor. The most valuable instruments come mainly from the university's resources. There were no significant private collections of scientific instruments. The preserved items – the largest Polish collections – were associated with the practice of science at universities, mainly in Krakow and Wrocław. However, not everything; e.g. a valuable set of fifteenth-century astronomical instruments (an astrolabe, a torquetum and a celestial globe) that was owned by the astronomer and astrologer Marcin Bylica, made in Vienna – these instruments were located in Buda, where Bylica worked. They were sent to Krakow only after Bylica's death, so they were not associated with practicing science in Poland. From the mid-seventeenth century onwards, when Enlightenment science developed, followed by the creation of research and teaching cabinets, in Poland, this movement does not begin until the mid-eighteenth century. It resulted in the fact that few 18<sup>th</sup>-century instruments have survived to this day. Collections of 19<sup>th</sup>-century and early 20<sup>th</sup>-century instruments are more numerous. In this group, the most valuable is a set of apparatus for liquefying gases. It is a testimony to cryogenic research conducted by Karol Olszewski, Zygmunt Wróblewski and their successors, conducted at the Jagiellonian University in Krakow.

Although the historical scientific instrumentation in Poland is inferior to the world collections, it is important for Polish science and culture.

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## Światowy inwentarz zabytkowych przyrządów naukowych – polski wkład

Artykuł poświęcony jest projektowi realizowanemu po drugiej wojnie światowej przez historyków nauki, którego celem było zbadanie światowych zasobów historycznych przyrządów naukowych. W artykule przedstawiono wyniki prac badawczych, których celem było poznanie sposobu realizacji i rezultatów opracowania inwentarza historycznych przyrządów naukowych zachowanych na ziemiach polskich po II wojnie światowej.

W 1956 r. przy Międzynarodowej Unii Historii i Filozofii Nauki w Paryżu – Sekcji Historii Nauki powołana została *Commission pour l'inventaire mondial des appareils scientifiques d'intérêt historique* (Komisja Światowego Inwentarza Zabytkowych Przyrządów Naukowych). Celem Komisji było koordynowanie prac nad wykonaniem światowego inwentarza historycznych przyrządów naukowych. Opracowany został wzór karty inwentaryzacyjnej, kryteria doboru zabytkowych przyrządów do inwentarza i ustalone zostały terminy realizacji projektu. W pracach Komisji uczestniczyli członkowie co najmniej 29 krajów. Projekt realizowany był przez europejskie muzea nauki i techniki oraz narodowe akademie nauk.

Dane w formie fiszek przygotowane zostały m.in. przez badaczy francuskich, włoskich, belgijskich, czeskich, polskich. Katalog rosyjski został opublikowany. W Polsce prace nad inwentarzem prowadzone były przez Zakład Historii Nauki i Techniki Polskiej Akademii Nauk w latach 1959–1963. Prace kwerendalne zlecone zostały Tadeuszowi Przypkowskiemu, historykowi nauki, gnomonikowi i kolekcjonerowi. Wytypował on do światowego inwentarza około 100 najcenniejszych obiektów nauki ze zbiorów polskich muzeów i innych instytucji. Blisko 20% stanowiły zabytki gnomoniki, pozostałe to przyrządy astronomiczne, wyposażenie zabytkowych aptek i pojedyncze przedmioty z innych dziedzin nauki. Pod kierunkiem T. Przypkowskiego prowadzone były również prace nad przygotowaniem krajowego inwentarza historycznych przyrządów naukowych. Zachowane dokumenty nie pozwalają stwierdzić, na jakim etapie te prace zostały zakończone. Obecnie w Instytucie Historii Nauki im. L. A. Birkenmajerów PAN realizowany jest projekt „Narodowy inwentarz historycznych przyrządów naukowych”. Jego celem jest stworzenie elektronicznej bazy zabytkowego instrumentarium naukowego przechowywanego w polskich muzeach. Projekt finansowany jest przez Narodowe Centrum Nauki (Projekt badawczy OPUS 13 nr 2017/25/B/HS3/01829).