

<https://doi.org/10.3176/hum.soc.sci.1995.2.01>

## BALTIC SCIENCE AS A BRIDGE BETWEEN EAST AND WEST

Karl SIILIVASK

Teadusajaloo ja Teadusfilosoofia Eesti Ühendus (Estonian Union of the History and Philosophy of Science). Estonia pst. 7, EE-0100 Tallinn, Eesti (Estonia)

Presented by J. Kahk

Received June 30, 1994; accepted November 16, 1994

The 17th Baltic Conference on the history of science took place on October 4 to 6, 1993, in Tartu, the main subject being "Baltic Science between the West and the East". By the beginning of the Conference a collection of Conference materials was published.<sup>1</sup> The Conference was organized by the Baltic Association of the History and Philosophy of Science together with Tartu University and Estonian Academy of Sciences.

Baltia, the Baltic countries or the Baltic States (Estonia, Latvia, Lithuania) is a geopolitical term recognized in the 20th century. At the 17th Conference the concept "Baltic science" was treated as science which in the course of time has been developed on the territory of the three countries in many different languages (Latin, Swedish, German, Russian, Polish, Lithuanian, Latvian, and Estonian) by scientists of various nationalities.

As the languages of Baltic nations — Estonian, Latvian, Lithuanian — are very different and cannot be understood by the neighbours without special studies, the languages of communication between them have been German and Russian, and during the Soviet occupation mostly Russian. Therefore Russian was also used at the Baltic conferences on the history of sciences which have been regularly held since 1958. A few presentations by foreigners were made in English or German.

At the 16th Baltic Conference held in Vilnius and Kaunas (1991), there were more foreign guests and the Conference materials were published in Russian, English and Lithuanian.<sup>2</sup> In some sections the majority of papers were presented in Lithuanian, and, unfortunately, because of that it was impossible for representatives of other countries to participate in the discussions.

<sup>1</sup> 17th Baltic Conference on History of Science: Baltic Science between the West and the East. XVII Балтийская конференция по истории науки: Балтийская наука между Западом и Востоком. Tartu, 4–6 October 1993, Tartu Ülikooli Kirjastus, (Henceforth: 17th Baltic Conference on History of Science.)

<sup>2</sup> Baltijos Valstybiu mokslu istorijas fragmentai. Fragments of the History of Science in the Baltic States. Фрагменты Балтийской истории науки. Triju Baltijos valstybiu XVI mokslu istoriku konferencijos tezes. Abstracts of the 16th Baltic Conference of History of Science, I. Spaude "Raides" spaustuve rotoprintu, Vilnius, 1991; II. Spaude "Raides" spaustuve rotoprintu, Vilnius; Kaunas, 1991.

Due to the fact that the knowledge of foreign languages considerably improved in the '90s, English, German in addition to Russian were justifiably chosen as the official languages of the 17th Baltic Conference on History of Science. From among the Conference materials 18 abstracts were published in English, 11 in German and 19 in Russian. The language of discussions was usually that of the presented paper. In the discussions among the Baltic researchers Russian tended to dominate as the most convenient language. German was the language of the seminar of October 4, 1993, dedicated to the scientific links between Tartu University and German universities (organized by Tartu and Kiel Universities). There were 12 papers presented at the seminar. More than a hundred historians took part in the Conference and the seminar: 8 from Latvia, 7 from Lithuania, 3 from Finland, 2 from Germany, 2 from the U.S.A., 1 from Russia. Because of problems with the visa, also, perhaps, financial difficulties, several guests from Latvia, Lithuania, Byelorussia and the Ukraine could not make it.

The attention of the Conference was centred around the three main problems — the role of Tartu University in the development of science in the 19th century, science in the Baltic States during the period of independence (1919—1940), problems of contemporary Baltic science. Further on these questions would be more profoundly touched upon. The problems will also be dealt with in most articles published in the present number of Proceedings.

## DEVELOPMENT OF THE BALTIC REGION OF SCIENCE

Science in the Baltic countries emerged in connection with the foundation of universities. The first university in the Baltic States was Vilnius University — the Academy of Vilnius — founded in 1589 as a centre of the Catholic counter-reformation. After the Livonian War followed by the Swedish-Polish wars Estonia and Livonia were joined to Sweden. In 1632 King Gustav II Adolf founded a Protestant university in Tartu (Dorpat), named as *Academia Gustaviana* (later *Academia Gustavo-Carolina*), but its activities came to an end in 1710 during the Northern War. In both Vilnius and Tartu Universities the language of instruction and science was Latin, in Tartu sometimes also Swedish and German. Scientific ties of the Academy of Vilnius were mainly limited to Polish-Lithuanian, but also other Central European Catholic universities. Tartu University had closer links with the universities of the Swedish Empire and also with those of Protestant Northern Germany and the Netherlands.<sup>3</sup>

Due to religious opposition there were no remarkable contacts between those universities in the 17th century. In the 18th century Vilnius University remained the only scientific centre in the Baltic region; it was under strong influence of the Society of Jesus. However, in the second half of the 18th century, under the influence of European universities, secularization of science began there, which led to a flourishing of natural and exact sciences.<sup>4</sup> The language of instruction and science at that time was Polish.

At the end of the 18th century Lithuania and Vilnius University were incorporated into the Russian Empire. In 1802 Tartu University was

<sup>3</sup> Siilivask, K. (ed.). History of Tartu University 1632—1982. Periodika, Tallinn, 1985, 18—70.

<sup>4</sup> Клима Л. Точные науки в старинном Вильнюсском университете: школы и влияния. — In: 17th Baltic Conference on History of Science, 56—57; Gylienė, L. On the level of chemical science in the university of Vilnius in 1822—1833. — In: 17th Baltic Conference on History of Science, 52—53.

reopened. The first professional staff came mainly from Germany and German became the language of instruction. Vilnius University was closed by the czarist government together with Warsaw University — in 1832, after the Polish-Lithuanian revolt.

As is well known, Germany took the leading position in European and world science at that time. Owing to that as well as to the material support from the Russian state, Tartu University became one of the most prominent universities in Europe in the 19th century. In this way Tartu University, and also Tartu Veterinary Institute (founded in 1848), together with Riga Polytechnical College (founded in 1862, later Polytechnical Institute) assumed a remarkable role in building a bridge between the Russian and European science. The Baltic region of science under formation was most closely connected with German science in the West and with that of St. Petersburg (mainly the Academy of Sciences) in the East.

In the nineties of the 19th century the political situation in the Baltic countries changed. The czarist government began to carry out its active policy of Russification. Russian was introduced as an official language instead of German at Tartu University and other schools. A great number of Russian professors from St. Petersburg and Moscow came over to Tartu. Contacts with German science became weaker and Eastern ties became stronger. Alongside with the Germans, the number of Latvians and Estonians started to grow among the scientists. Yet, the majority of scientists of local nationalities were forced to look for jobs in Russia, as most posts of professors at the Baltic universities were occupied by German or Russian scientists. So the first generation of Latvian-Lithuanian-Estonian scientists were mainly active in exile.<sup>5</sup> Their scientific production was published in German or Russian and they were internationally mostly known as German or Russian scientists.

1917—1920s were characterized by the process of shaping the independence of the Baltic States. Establishing national universities formed a part of the process. Tartu University was reopened as an Estonian university. The new Latvian university was established in 1919 on the basis of Riga Polytechnical Institute. As Poland had incorporated the former capital of Lithuania — Vilno, a new university was founded in the new capital, which was Kaunas. In these universities and other new higher educational establishments the official languages of instruction and science were Estonian, Latvian and Lithuanian. Although all Estonian-Latvian-Lithuanian scientists now started their work in their respective homelands, this was still not enough to fill the posts of professors in all specialities. In the 1920s, a number of scientists from Germany, Russia, Finland and Sweden were asked to work in the Baltics. At first they were allowed to give lectures in German and Russian. It was not until the 1930s that the mother tongue was used as the language of lectures in the Baltic universities. By then the local national staff of scientists and the scientific terminology in Estonian-Latvian-Lithuanian had already formed. The majority of scientific production could now be published in the vernacular. The Baltic region of science had acquired a new quality, due to political reasons it was mainly oriented to the West, traditionally to Germany. German also maintained its role as the most important language of international communication.

Close contacts (conferences, seminars, etc.) between Baltic scientists were established. But the common languages at these meetings were still German or Russian. In 1935 English was decided to be taken into use as the main language of scientific intercourse, though not very successfully. In Riga, in 1937, at the I Congress of the Baltic Historians, where all

<sup>5</sup> Stradiņš, J. Latvian science in exile and its reintegration into science in Latvia. — In: 17th Baltic Conference on History of Science, 7—9.

the Baltic-Sea countries as well as the historians from Hungary, Italy and France were represented, 46 of the 59 reports were read in German, 11 in French and 2 in Italian.<sup>6</sup>

During the annexation of the Baltic states by the Soviet Union, the language of communication between the Baltic scientists was Russian for almost 50 years. In connection with international conferences organized here since 1960s English was taken into use parallel with Russian.

## THE BALTIC HISTORY OF SCIENCE

The establishment of Vilnius and Tartu Universities laid the foundation for the systematic scientific activities in disclosing the importance of science as well as the history of research in the Baltic countries. We herewith shall try to present some key questions of Baltic science, proceeding from the historiography of the history of Tartu University. The tradition of investigating the history of Vilnius University was set up later and it was episodic, as the University was closed down in 1832.<sup>7</sup>

The starting-point of the history of Tartu University (*Academia Gustaviana*) could be marked by the publishing of a book by Friedrich Menius, the first Professor of History at Tartu University, who gives a survey on the establishment and the opening ceremony of the University.<sup>8</sup> Professor Arvid Moller was the second one to deal with the history of the University in his book on Tartu University.<sup>9</sup> Ingemund Bröms compiled the first research under the title "History of Tartu University" at the beginning of the 18th century, but this remained in manuscript.<sup>10</sup> H. L. C. Backmeister completed and published a survey on the history of Tartu University 1632—1710, together with source materials.<sup>11</sup> After the reopening of Tartu University, the number of works dealing with its history saw a rapid growth. We shall only mention the most important works here. The following main divisions can be distinguished in the literature devoted to the history of Tartu University: German or Baltic-German sources, Russian sources, Estonian and Soviet-Estonian sources. Swedish historians have also been interested in the history of Tartu University, concentrating, however, mainly on the Swedish period. The oldest and weightiest are doubtlessly the works of Baltic-German historiographers.

The tradition of research in the history of the University was originally connected with several celebrations, mainly anniversaries. Baltic-German (also Russian) historians regarded the reopening of Tartu University in 1802 as the establishment of a new university. Therefore the 25th, 50th, 75th anniversaries of Tartu University were celebrated and printed matters were published in 1827, 1852, 1877.<sup>12</sup>

<sup>6</sup> Siilivask, K. Balti riikide teadlaste koostöö probleeme ja perspektiive. — In: Teaduslugu ja nüüdisaeg, VIII. TTC, Tallinn, 1993, 251—254.

<sup>7</sup> Rostovski, S. Lituanicarum Societatis Jesu historiarum Provincialium. Vilnae, 1768; Balinski, M. Dawna Akademia Wilenska. Petersburg, 1862; Bieleniski, J. Uniwersytet Wilenski (1579—1831). Krakow, 1899—1900.

<sup>8</sup> Menius, F. Relatio von Inauguration der Universität zu Dorpat geschehen den 15. Oktober im Jahre 1632. Dorpat, [1632].

<sup>9</sup> Moller, A. Fata Dorpati. Den i Förra tiden namnkunniga Lilländska Staden Dorpats öde. Wästeras, 1755.

<sup>10</sup> The Department of Manuscripts and Rareties of the Scientific Library of Tartu University. Stock 7. Item 39.

<sup>11</sup> Backmeister, H. L. C. Nachrichten von der ehemaligen Universitäten zu Dorpat und Pernau. Sammlung der russischen Geschichte, IX. St. Petersburg, 1764.

<sup>12</sup> Die Kaiserliche Universität zu Dorpat. Fünfundzwanzig Jahre nach ihrer Gründung. Dorpat, 1827; Beise, T. H. Die Kaiserliche Universität Dorpat während der ersten fünfzig Jahre ihres Bestehens und Wirkens. Dorpat, 1853; Gedenksblätter an das fünfundsiebzigjährige Bestehen der Landesuniversität Dorpat von der Redaktion der "Dorpater Stadtblattes". Dorpat, 1877.

The attitude of the Baltic-German historians towards the work of the Swedish University was predetermined by their opposition to the Swedish authorities, which stemmed from the reduction of manors carried out by the latter. Carl Schirren's assertion that the University had ended in failure without leaving any traces, is characteristic in this respect.<sup>13</sup>

As the Russian press became increasingly critical of the Baltic Rule and Jurisdiction System of the 1860s, the Baltic-German historians repudiated the theory of the cultural mission of the Russians in the Baltics in order to defend the privileges of the local Germans. The ideology of the *Kulturträgetum* and *Kulturkampf* is manifested quite clearly in the History of Tartu University compiled by Theodor Neander in Germany (1882)<sup>14</sup> and in the other works.<sup>15</sup> The leitmotif of these works is the role of Tartu University as the carrier and defender of Western culture in Russia, which was justified to a considerable extent.

Russian historiographers did not systematically deal with the history of Tartu University before the turn of the 19th century. After the Russification reform of Tartu University in 1889—1895, a dispute concerning financial and other problems flared up between Anton Budilovich, the new Rector, and the prereform Rector Georg von Oettingen. This reflected the controversy between the supporters of reform and its opponents.<sup>16</sup> Generally speaking the Russian historians continued the Baltic-German tradition of celebrating the anniversaries of the University since 1802. In 1902, to mark the centenary of the reopening of the University, Professor Jevgeni Petukhov compiled a two-volume history of the Imperial Tartu University<sup>17</sup>, which is the most thorough study of the University from that period. An objective survey on the work of the University under the Swedish rule has also been given, but this was only treated as the pre-history of Tartu University. At the turn of the century science showed a rapid growth in the whole world, bringing along an interest not only towards history of science, but to science as such and the regularities of its development; this became now an object of investigation in its own right. In the course of discussions a new term *Wissenschaft der Wissenschaft* (Science of Science) was taken into use, formulated by Wilhelm Ostwald, the offspring of Tartu University, then Professor of Physics at Leipzig University.<sup>18</sup>

Estonian historiographers thoroughly investigated the history of the Swedish-time University in the 1920s, and stressed the importance of its role in the establishment of scientific activities in Estonia. Therefore the third centenary of Tartu University was celebrated for the first time in 1932. An illustrated survey of Tartu University<sup>19</sup> and a work on the history of students<sup>20</sup> were published.

<sup>13</sup> Schirren, C. Zur Geschichte der schwedischen Universität in Livland. Mitt. aus dem Gebiete der Geschichte Liv-, Ehst- und Kurlands. 1853, 7, H. 1, 3—4.

<sup>14</sup> [Neander, T.] Die Deutsche Universität Dorpat im Lichte der Geschichte und Gegenwart. Eine historische Studie auf dem Gebiete östlicher Kulturkämpfe. Leipzig, 1882.

<sup>15</sup> Gernet, A. v. Die im Jahre 1802 eröffnete Universität Dorpat und die Wandlungen in ihrer Verfassung. Reval, 1902; Engelhardt, R. v. Die Deutsche Universität Dorpat im ihrer geistgeschichtlichen Bedeutung. Reval, 1933, etc.

<sup>16</sup> Siilivask, K. (ed.). The History of Tartu University 1632—1982, 13—15.

<sup>17</sup> Петухов Е. В. Императорский Юрьевский, бывший Дерптский, университет за сто лет его существования (1802—1902), 1. Юрьев, 1902; Петухов Е. В. Императорский Юрьевский, бывший Дерптский, университет в последний период своего столетнего существования (1865—1902), 2. СПб, 1906.

<sup>18</sup> Martinson, K. Teadusloo radadel. — In: Teaduslugu ja nüüdisaeg, VII, 2. Teadus iseiseisvas Eestis: minevik, olevik, tulevik. Eesti TA rotaprint, Tallinn, 1991, 96—98.

<sup>19</sup> Tartu ülikool sõnas ja pildis 1919—1932. Tartu, 1932.

<sup>20</sup> Vasar, J. (ed.). Tartu üliõpilaskonna ajalugu seoses eesti üliõpilaskonna ajalooa. Tartu Üliõpilaskonna Kirjastus, Tartu, 1932.

In Soviet times the Pro-Rector of the University, the biochemist Eduard Martinson, backed by Russian chauvinists, turned the history of Tartu University back to Baltic-German tradition, and organized the celebrations of the 150th anniversary of the University in 1952. However, his ignoring the Swedish-time University did not last long. The Commission of the History of Tartu University under the chairmanship of Prof. Karl Siilivask set up in 1972, began systematic work of directing the composition of the history of the University. As a result, twenty seven volumes of a serial publication have appeared since 1975, comprising a considerable part of the research papers devoted to the history of the University.<sup>21</sup> In 1982, the 350th anniversary of Tartu University was celebrated and a new three-volume history of Tartu University was published.<sup>22</sup> Three years before that Vilnius University had celebrated its 400th anniversary and had also published a new three-volume history<sup>23</sup>. The 125th anniversary of Riga Polytechnical Institute, the third Baltic higher educational establishment of major importance was celebrated in 1987.

Until the end of the 1950s the investigating of the history of science was isolated in the three Baltic states, there were no unions organized or regular joint activities going on. The Unions of the History and Philosophy of Science in the Baltic countries were formed in the 1950s—60s as the branches of the Soviet National Committee of the History of Science: the Latvian Branch in 1958, the Lithuanian Branch in 1964 and the Estonian Branch in 1967.

It was the Latvian Branch of the History and Philosophy of Science to initiate the I Conference on the History of Baltic Science in Riga (1958). At the Conference a Commission was formed to co-ordinate research work in the three republics. In 1959 the II Conference in Tartu (Estonia) and the III Conference in Vilnius (Lithuania) took place. Up to 1993 seventeen Conferences on the History of Baltic Science have been held. A short survey of these is given in the following Table.

In the 1960s it became a question of prestige to take part in the Conferences on the History of Baltic Science by all scientists of the republics of the European part of the Soviet Union and Transcaucasia (esp. Georgia and Armenia); these conferences became all-Union. In the VII Conference that took place in 1968 in Riga, scientists from foreign countries also took part, for the first time. Among those few who also took part in the next conferences there were scientists, from England, Sweden and Finland. At the beginning the working language of the conferences was Russian, which was binding for all participants. The speeches by the foreigners were made in other languages — English or German. With the developing of *perestroika* in the Soviet Union and the restoration of independence of the Baltic States the reorganisations of the scientific institutions came also to the fore.

In February 1988, at a get-together in Riga, we decided to set a basis for an independent Baltic Association of the History and Philosophy of Science. This decision was approved of by the Presidiums of Latvian, Lithuanian and Estonian Academies of Sciences. The organizational fundamentals of activities of the Association were endorsed in Riga on the 29th of October, 1990. There the Committee of the Baltic Association of the History and Philosophy of Science was formed and the first President of the Baltic Association of History of Sciences was elected — Janis Stradiņš, Member of the Latvian Academy of Sciences.

<sup>21</sup> Tartu Ülikooli ajaloo küsimusi, I—XXVII, Tartu Riiklik Ülikool, Tartu, 1975—1993.

<sup>22</sup> Tartu Ülikooli ajalugu kolmes köites 1632—1982, I—III. Eesti Raamat; Valgus, Tallinn, 1982.

<sup>23</sup> Vilniaus universiteto istorija 1579—1979, Vilnius, 1976, 1977, 1979,

Particulars about the Conferences of History of Science  
of the Baltic States 1958—1993\*

No.	Year	Place	Partici- pants	Re- ports	Notes
I	1958	Riga	30	11	
II	1959	Tartu	30	14	
III	1959	Vilnius ov.	50	36	A summary of reports (theses) published.
IV	1962	Riga	100	65	The reports published in special summaries, reports partly in serial summary "Из истории естествознания и техники Прибалтики", Riga, 1968. The last have till now publ. 9 volumes.
V	1964	Tartu	150	83	
VI	1965	Vilnius ov.	150	100	
VII	1968	Riga	250	97	
VIII	1970	Tartu	175	83	
IX	1972	Vilnius	156	107	
X	1975	Riga	500	90	Dedicated to the 200th anniversary of Miiitav' (Jelgava) Academy.
XI	1977	Tallinn Tartu	250	179	The reports were published in three editions.
XII	1979	Vilnius	270	161	Dedicated to the 400th anniversary of Vilnius Univ. 3 coll.-s publ.
XIII	1982	Tartu	250	130	Dedicated to the 350th anniversary of Tartu Univ. 4 coll.-s publ.
XIV	1985	Riga	190	140	
V	1987	Riga	260	190	Dedicated to the 125th anniversary of Riga Polytechnical Institute.
XVI	1991	Vilnius Kaunas	300	159	The official languages were Russian, English, Lithuanian.
XVII	1993	Tartu	110	58	The official languages English, German, Russian.

\* Васильев К. Т., Страдынь Я. П., Калнин В. В., Пальм У. В. (comp.). Аннотированный список конференции историков науки Прибалтики (1958—1985). Tartu, 1986; Krikštopaitis, J., Siilivask, K., Stradiņš, J. XVI Baltijas Valstu, zinātņu vēstures konference (Vilnā—Kaunā, 1991. g. oktobri). Acta Historiae Scientiarum Baltica, 9. Baltijas zinātņu vēstures apcerējumi, 9. Из истории естествознания и техники Прибалтики, 9. Riga, 1992, 293—295.

At the 16th Baltic Conference of the History of Science in October, 1991, in Vilnius, the statutes of the Baltic Association of the History and Philosophy of Science was confirmed at a meeting of the Assembly of the Baltic Association, and a new Presidium of the Association with a new President were elected — Karl Siilivask, Chairman of the Estonian Union of the History of Science, Member of the Estonian Academy of Sciences.<sup>24</sup>

According to the statutes, the Science Unions of Lithuania, Latvia and Estonia are included into the Baltic Association as independent bodies, being attached to the Academies of Sciences of Lithuania, Latvia and Estonia, respectively. As to the Presidium of the Association, the Chairmen and Secretaries of all three Science Unions are all its members. The Presidium pursues its activities at that academy whose Member the President happens to be.

<sup>24</sup> Siilivask, K. Balti riikide teadlaste koostöö probleeme ja perspektiivi. — In: Teaduslugu ja nüüdisaeg, VIII. Tallinn, 1993, 253—254.

On August 25, 1993, the International Union of the History and Philosophy of Science/Division of History of Science at the General Assembly in Saragossa (Spain), elected the Baltic Association of the History and Philosophy of Science as Ordinary Member. It was also decided to give it financial support, which would enable to organize the 17th Baltic Conference on History of Science in Tartu.

## THE ROLE OF BALTIC-GERMAN SCIENCE IN THE 19TH CENTURY

The development of science in the 19th century Baltic countries was closely connected with Tartu University, Vilnius University being closed. As it was marked above, the first staff of Tartu University came mostly from German universities. In 1802—1825 83% of them were Germans, with 35% being of Baltic German origin. In 1826—1875 the Baltic Germans and the scholars from Tartu University predominated among the lecturers, the latter forming 56% of the total number of teaching staff.<sup>25</sup> The middle of the 18th century saw the consolidation and fast rise of the local Baltic-German culture, which reflected German Protestant culture in general, but also maintained its own specific features. The 19th century brought along the flourishing period of this culture, science being its most outstanding and internationally recognized part.

During the 19th century nearly one hundred scientists-professors went over to Russian universities or to the St. Petersburg Academy of Sciences (C. F. Parrot, H. Hess, K. E. von Baer, W. Struwe, A. T. Middendorf, etc.). They disseminated scientific trends that, originating from Germany, had already been confirmed in Tartu, but also propagated totally new schools of science. In the middle of the 19th century the astronomers from Tartu occupied leading positions in all the Russian observatories. The middle of the 19th century also saw an intensive move-over to the West. So, in the second half of the 19th century nearly fifty graduates and professors from Tartu University proceeded to Europe, the majority of them to German universities. They took along several new research directions and schools, as, for instance, those connected with the application of new methods of mathematics and chemistry in natural sciences and medicine. This originated from the Chemistry Laboratory of Tartu University and the activities of professor Carl Ernst Heinrich Schmidt (1822—1894). C. Schmidt was educated at the Gymnasium of Jelgava (Mitau), he then studied Chemistry at the Universities of Berlin and Gießen (under Justus Liebig), and graduated from the University of Göttingen. In 1847 he started to work at the Department of Physiology and Pathology under Professor Friedrich Bidder; they soon started a project of biochemical investigation of processes of digestion and metabolism. This resulted in their joint monograph *Die Verdauungssäfte und der Stoffwechsel* (1852), which played an important role in the development of the fermentative theory of digestion.

Research work of the physiologist Hermann Adolf Alexander Schmidt (1831—1894) was also based on chemical research methods. Alexander Schmidt isolated fibrin ferment from blood serum, studied the role of leucocytes, cellular proteins and other blood components in the coagulation process, created the fermentative theory of blood coagulation, the basic principles of which still hold in our days. His fundamental research laid the foundation to the further development of clinical hematology and blood transfusion.<sup>26</sup> The scientific activities of one of his and Carl Schmidt's numerous students, Gustav Piers Alexander von Bunge, at Tartu

<sup>25</sup> Tartu Ülikooli ajalugu, II. 1798—1918. Tallinn, 1982, 57, 91.

<sup>26</sup> Siilivask, K. (ed.). History of Tartu University 1632—1982, 121, 124—125.



and Basel Universities have been analysed by Lembit Tähepõld and Tullio Ilomets (see the next article in the present issue).

The application of exact biochemical methods made Tartu University a birthplace of contemporary Pharmacology. Pharmacology was radically reformed by Rudolf Richard Buchheim (1820—1879, in Tartu 1847—1867). He may be rightfully considered the founder of Experimental Pharmacology, for it was he who introduced chemical analysis and animal experiments into Pharmacology. The textbook of Pharmacology by Buchheim *Lehrbuch der Arzneimittellehre*, which came out in four editions (1853—1883), is worth mentioning, as it was to become the cornerstone of modern Pharmacology. Buchheim worked in close contact with C. Schmidt and Fr. Bidder. When R. Buchheim moved to Germany (Gießen University) in 1867 and his most prominent student Oswald Schmiedeberg moved to Strassburg University in 1873, the experimental approach of the Tartu Pharmacology School spread all over the world.<sup>27</sup>

In 1852 Carl Schmidt became Professor of the Chair of Chemistry at Tartu University. Together with Vassili Dokuchayev he had studied the black soil in Central and South Russia. In fact these studies were the first systematically conducted soil assays in the world by the method of chemical analysis. He also compiled a detailed project for the distributional mapping of the Russian hydrosphere constituents. His works in Hydrochemistry became well known all over the world. Carl Schmidt's most prominent students were Wilhelm Friedrich Ostwald (1853—1932) and Gustav Heinrich Johann Apollon Tamman (1861—1938), founders of a new branch of Physical Chemistry. The first studied Chemistry at Tartu University and after graduating worked there until 1881, when he became Professor of Chemistry at Riga Polytechnical Institute. From 1887 he was Professor at Leipzig University, winning the Nobel Prize in 1909. G. Tamman was elected to the Chair of Chemistry and directorship of the Chemistry Institute at Tartu University in 1892. 1903—1930 he worked at Göttingen University.

While Tartu University played the role of a bridge between East and West, it also had an extraordinary role in the development of Russian science of the 19th century. This fact is reflected in most conference papers of this period.

## THE SCIENCE IN INDEPENDENT BALTIC STATES

After the Russification reform of Tartu University in 1889—1895, the ties between Baltic and German science became weaker and those with Russian centres of science became stronger. The student body of Tartu University became more international. Alongside with Russian students the number of Jews, Poles, Estonians, Latvians and Lithuanians grew rapidly. In the years 1890—1918 there were more than 1000 Polish, nearly 900 Latvian and an equal number of Estonian students, and 750 Lithuanian students from amongst whom also grew more and more scientists. Thus in 1918 there were five Estonian and four Latvian professors at Tartu University and Tartu Veterinary Institute, but noticeably more associate professors, private associate professors, and readers. Similar features were characteristic of the Riga Polytechnical Institute. Finally, Lithuania also joined the united Baltic science region. Alongside German and Russian scientists, Estonian, Latvian and Lithuanian scientific fellowship began to take shape, which was an important precondition for coming into being of the three independent Baltic States.

<sup>27</sup> Ibid., 125—126.

During 1917—1920, the process of shaping the independent Baltic States as well as their separating from Russia proceeded successfully. Establishing national universities played an important part in this process. Tartu University was reopened as an Estonian university in 1919, and 50 per cent of its preliminary teaching staff was formed on the basis of professors and university graduates of Tartu. The new Latvian University was established in 1919 on the basis of Riga Polytechnical Institute. Teaching staff here also included 50 per cent of Tartu University and Tartu Veterinary Institute's professors and graduates. As a matter of fact, 25 per cent of teaching staff of Kaunas University also came from Tartu University. Close mutual contacts between Baltic scientists were established. Medical and natural scientists, historians and others held their conferences, seminars and other kind of meetings in common.<sup>28</sup>

To reduce the German and Russian influence scientists from the Baltics turned to the Nordic and English-American scientists. Thus, during the nineteen twenties many Swedes and Finns were offered professorships at Tartu University. Finns were often favoured because they could more easily master the Estonian language and lecture in Estonian. Though Germany still preserved its leading position, the Nordic countries became increasingly more influential. This new orientation was characterized in Mare Viiralt's presentation "The role of foreign academic centres in the foundation and formation of Estonian National University in Tartu in the years 1919—1929". It appears that Estonian scientists took their scientific trips and defended their doctoral theses mainly in Central Europe (Germany 23%, Austria 9%, France 15%), in Nordic Countries 20% (Finland 11%, Sweden 5.5%, Norway 2%, Denmark 1.5%), much less in Anglo-American countries (England 7%, U.S.A. 2%).<sup>29</sup>

The works of quite a lot of Estonian, Latvian and Lithuanian scientists were internationally recognized. Professor Teodor Lippmaa (1892—1943) published a number of papers on the structure of plant communities, where an original new method of synusia was presented. The publications *Acta Instituti et Horti Botanici Universitatis Tartuensis* were distributed all over the world. Professor of Astronomy Ernst Öpik (1893—1985) became a pioneer in the study of extragalactic astronomy. By giving a reliable estimation of the distance to the Andromeda stellar system he proved the reality of extragalactic stellar systems. Professor Ludvig Puusepp (1875—1942) was a pioneer in Neurosurgery. Under the guidance of L. Puusepp the Tartu Neurological Clinic acquired international fame, admitting patients from Latvia, Poland, Finland and other foreign countries. In 1923—1939 he edited a special neurological journal *Folia Neuropathologica Estoniana*, and published a three-volume handbook *Chirurgische Neuropathologie* (1932—1939).

## THE BALTIC SCIENCE IN THE SOVIET SYSTEM AND THE RE-ESTABLISHMENT OF INDEPENDENCE

During the annexation of the Baltic States by the Soviet Union the relations of the Baltic science with the West were destroyed. At the end of World War II nearly half of scientists of these countries were forced to leave and work in exile.

Soviet imperial policy of science was following the basic principle — from the centre to a republic, i. e. science was directed from Moscow.

<sup>28</sup> Siilivask, K., Tankler, H. The Baltic Region of Culture and Science (General Historical Aspects). Baltic and Nordic Symposium of the History of Science. Summaries. Tallinn/Tartu, 21.—23. April 1992, 17—18.

<sup>29</sup> 17th Baltic Conference on History of Science, 23—25.

Nevertheless, former mutual scientific relations between Estonian, Latvian and Lithuanian scientists were gradually re-established. From the 1960s the international relations of the Baltic scientists were also re-established, especially those between the Finnish and Estonian researchers. The aspirations of the Baltic scientists for the survival of their national science and culture formed an essential part in the civil resistance of these nations against the Sovietization and Russification.

We should not, though, regard the development of the Soviet-time science one-sidedly, as all negative. The Soviet Union created and developed a strong scientific system in the humanities and natural sciences. Academies of Sciences were established in all the Baltic States. Influential research institutes in Physics, Astronomy, Chemistry, Biochemistry, Cybernetics, etc. were formed. Financing was also sufficient. Of course, social sciences and the humanities, including national sciences (Ethnology), were under a strong ideological pressure. Yet, a number of Estonian, Latvian and Lithuanian scientists had acquired a powerful potential and internationally recognized research results.

A break in the development of the Baltic science was brought about by *perestroika* in the Soviet Union and regaining independence by the Baltic States. Now, when projecting science policy, one's own national interests are taken into account as primary. At the same time essential importance is attached to creating new contacts in the West, also to westernization of higher education and science. New perspectives have emerged to consolidate the strivings of the Baltic scientists at home and in exile. So far the best results in this connection have been achieved in Lithuania — the establishment of a university in American style — the Kaunas University of Vitautas the Great. In Latvia a number of co-ordination centres of mutual research work have been established for reintegration of Latvian science in exile into science in Latvia. In order to involve all the scientists it is important to call into being an Institute of Baltic Studies or a Baltic Academy of Sciences, the idea of which was already advanced in 1920—1940.

At present the Estonian Academy of Sciences has made collaboration contacts with all the academies of science of the Nordic countries, with the academies of Hungary, England, France, Spain; Tartu University has done so with many universities of Europe.<sup>30</sup> But at the same time, due to political and economic contradictions, the Eastern contacts of Baltic science have become markedly weaker. Yet, during several periods of history Eastern contacts had a positive influence on the development of Baltic science. Hopefully, scientific co-operation and friendly relations with Russia will be restored in the nearest future.

<sup>30</sup> Siilivask, K., Tankler, H. The Baltic Region, 18—19.

## BALTI TEADUS SILLANA IDA JA LÄÄNE VAHEL

Karl SIILIVASK

4.—6. oktoobrini 1993 toimus Tartus XVII Balti teadusajaloo konverentsi, mille põhiteemaks oli «Balti teadus Ida ja Lääne vahel». Selle nimetuse all ilmus ka konverentsi materjalide kogumik. Konverentsi korraldas Teadusajaloo ja Teadusfilosoofia Balti Assotsiatsioon, mis on välja kujunenud Teaduse ja Tehnika Ajaloo Nõukogude Rahvusliku Ühenduse osakondadest kohalike akadeemiade juures — Lätis (1958), Leedus (1964) ja Eestis (1967). Lätis algatati 1958. aastal Balti teadusajaloo konverentside traditsioon. Esimene neist toimus Riias. Senised teadusajaloo konve-

rentsid peeti põhiliselt vene keeles. 1988. aastal otsustati luua iseseisev Balti Teadusajaloo ja Teadusfilosoofia Assotsiatsioon. 1990 moodustati assotsiatsiooni komitee eesotsas presidendi Läti TA akadeemiku Janis Stradiņšiga. 1991 Vilniuses toimunud XVI Balti teadusajaloo konverentsil kinnitati assotsiatsiooni põhikiri, valiti presiidium ja uus president (Eesti TA akadeemik K. Siilivask). Järgnevalt esitati ka taotlus Balti assotsiatsiooni vastuvõtmiseks Rahvusvahelisse Teadusajaloo ja Teadusfilosoofia Ühioni. Liikmeks saadi 25. augustil 1993 Saragossas (Hispaania).

Pärast Balti riikide taasiseseisvumist toimunud XVII Balti teadusajaloo konverents oli esmakordselt ametlikult rahvusvaheline. Sellest võttis osa üle 100 teadusajaloolase, neist 8 Lätist, 7 Leedust, 3 Soomest, 2 USA-st, 2 Saksamaalt ja 1 Venemaalt. Konverentsi töökeelteks olid võrdsetel alustel meil ajalooliselt väljakujunenud teaduskeeled — saksa, inglise ja vene keel. Niisugune korraldus õigustas ennast töö käigus täielikult. Konverentsi kogumikus avaldatud töödest oli 18 inglise, 11 saksa ja 19 vene keeles.

Esitatud ettekanded koondusid kolme sõlmprobleemi ümber: Tartu ülikooli osa rahvusvahelise teaduse arengus 19. sajandil, teadus Balti riikides esimesel iseseisvusperioodil (1919—1940) ning Balti teaduse probleemid Nõukogude okupatsiooni tingimustes ja pärast taasiseseisvumist.

19. sajandil kujunes Balti ala saksa (baltisaksa) teaduse regioniks. 1802 taasavatud Tartu ülikooli õppejõudude koosseis pärines rohkem kui 80% ulatuses Saksamaa ülikoolidest, neist olid 35% baltisakslased. 19. sajandi keskpaigaks olid ülekaalu saavutanud Tartu ülikooli oma kasvandikud, peamiselt baltisakslased, moodustades ligi 60% õppejõudude üldarvust. Sama koosseisuga ja saksakeelsed olid ka 1848 asutatud Tartu Veterinaaria Instituut ja Riia Polütehniline Instituut (1862). Kuna Saksamaa oli 19. sajandil juhtiv teadusmaa maailmas, siis kandusid sealt Baltimaile uued teaduslikud ideed ja koolkonnad, mis omakorda liikusid siit edasi Venemaale ning mujalegi. 19. sajandil siirdus Tartu ülikoolist teistesse Venemaa ülikoolidesse ja teadusasutustesse ligi 100 professorit ja teaduskraadi omandanud teadlast. Mitmed neist said Peterburi Teaduste Akadeemia akadeemikuteks (G. F. Parrot, E. Lenz, H. Hess, W. Struwe, K. E. v. Baer jt.). 19. sajandi keskpaigast kasvas Läände, peamiselt Saksamaale asumine. Seal tekkisid Tartust pärit keemiku Carl Schmidt'i ning füsioloogide Friedrich Bidderi ja Alexander Schmidt'i juhtimisel biokeemilise füsioloogia ja farmakoloogia (G. Bunge, R. Buchheim, J. Schmiedeburg jt.) ning füüsikalise keemia uurimissuunad (W. Ostwald, G. Tamman jt.).

Iseseisvates Balti riikides kujunesid aastail 1919—1940 välja kohalikes rahvuskeeltes viljeldav teadus ja rahvuslik teadlaskaader. Poliitilistel ja muudel põhjustel orienteeruti peamiselt Läände, 1920. aastail veel traditsiooniliselt Saksamaale, varasemast tunduvalt rohkem aga ka Põhjamaadele. Inglise ja Ameerika teaduse mõju hakkas kasvama alles 1930. aastail.

1940. aastal allutati Balti teadusasutused tsentraliseeritud juhtimisele Moskvast, sidemed läänepoolsete maadega praktiliselt katkesid. Stalinlike repressioonide kartuses lahkus 1944. aastal Baltimaadest Läände ligikaudu pool kvalifitseeritud teadlaskaadrist — peamiselt mindi Saksamaale ja Rootsi, sealt juba edasi ka USA-sse, Kanadasse ja Austraaliasse. Kodumaale jäänud teadlased jätkasid tööd füüsikalistest ja moraalsest repressioonidest ning venestamiskatsetest hoolimata, kaitstes ja arendades edasi rahvuslikku kultuuri ja teadust. Nii kodumaal kui ka eksiilis kujunes välja Balti teadlaste uus põlvkond, kes säilitas oma keele ja kultuuri. Perestroika ja iseseisvumisprotsess avasid tee eksiilis töötanud teadlaste ühinemisele taasiseseisvunud Balti riikide teadlastega, samuti sidemete taastamisele Lääne teadusega. Samal ajal nõrgenesid oluliselt Balti teadlaste idapoolsed kontaktid, eriti Venemaaga.

## БАЛТИЙСКАЯ НАУКА КАК МОСТ МЕЖДУ ЗАПАДОМ И ВОСТОКОМ

Карл СИЙЛИВАСК

4—6 октября 1993 г. в Тарту проходила XVII конференция историков науки стран Балтии на тему «Балтийская наука между Западом и Востоком». Под таким же названием был издан сборник материалов конференции. Конференцию организовала Балтийская ассоциация истории и философии науки, которая сформировалась из отделений Советского национального объединения истории, философии, науки и техники, действовавших при академиях наук Латвии (1958), Литвы (1964) и Эстонии (1967). Традиция проведения Балтийских конференций по истории науки родилась в 1958 г. в Латвии, и первая из них состоялась в Риге. Эта и последующие конференции проходили в основном на русском языке. В 1988 г. было решено образовать самостоятельную Балтийскую ассоциацию по истории и философии науки. В 1990 г. был создан комитет ассоциации во главе с президентом Я. Страдынем — академиком АН Латвии. В 1991 г. в Вильнюсе на XVI Балтийской конференции был утвержден устав ассоциации, избраны ее президиум и новый президент — академик АН Эстонии К. Сийливаск. 25 августа 1993 г. в Сарагосе (Испания) Балтийская ассоциация была принята в Международную унию по истории науки и философии. Так что XVII Балтийская конференция по истории науки впервые после восстановления независимости стран Балтии стала по статусу международной. В ней приняли участие свыше ста историков науки из восьми стран, в том числе из Латвии (8 человек), Литвы (7), Финляндии (3), США (2), Германии (2) и России (1). Рабочими языками конференции были традиционные в Балтии языки науки — немецкий, английский и русский, что в процессе работы полностью себя оправдало. В сборнике опубликовано 18 материалов на английском, 11 на немецком и 19 на русском языках.

Представленные на конференции доклады концентрировались вокруг трех узловых проблем: роль Тартуского университета в развитии науки в XIX столетии, наука в странах Балтии в первый период самостоятельности (1919—1940) и современные проблемы науки стран Балтии после восстановления независимости.

В XIX в. Балтийский край был регионом немецкой (балтийско-немецкой) науки. Во вновь открывшемся в 1802 г. Тартуском (Дерптском, Юрьевском) университете более 80% преподавателей составляли немцы, из них 35% — прибалтийские немцы, и те и другие являлись в основном воспитанниками университетов Германии. К середине XIX столетия профессорско-преподавательский состав Тартуского университета изменился в пользу своих же питомцев, которые (в основном прибалтийские немцы) составляли уже 60% от общего числа преподавателей. С немецким составом преподавателей и с немецким языком обучения были основаны Ветеринарный институт в Тарту (1848) и Рижский политехнический институт (1862). Поскольку в XIX в. Германия играла ведущую роль в мировой науке, то исходящие оттуда новые научные идеи оказывали непосредственное воздействие и на научные школы стран Балтии, а отсюда проникали в Россию и дальше. В XIX столетии, в основном в первой половине, из Тартуского университета в высшие учебные заведения и научные учреждения России перешли около ста профессоров и ученых со степенями. Так, академиками Петербургской академии наук стали Г. Ф. Паррот, Э. Х. Ленц, Г. Гесс, В. Я. Струве, К. Э. фон Бэр и др. С середины XIX в. возрос отток профессуры вместе со своими научными школами на Запад, глав-

ным образом в Германию. В первую очередь это были научные школы, основанные химиком Карлом Шмидтом, физиологами Ф. Биддером и Александром Шмидтом, биохимиками и фармакологами Г. Бунге, Р. Бухгеймом, И. Шмидебергом и др., а также специалистами по физической химии В. Оствальдом, Г. Тамманом и др.

В 1919—1940 гг. в самостоятельных государствах Балтии сформировались национальные кадры ученых, исследования велись и публиковались в основном на литовском, латышском и эстонском языках. В 1920-е годы по политическим и другим мотивам ориентировались главным образом на Запад, традиционно на Германию, а также и на Северные страны. Англо-американское влияние и роль английского языка возросли начиная с 1930-х годов.

Третьей существенной группой проблем было развитие науки в Прибалтийских государствах во время советской оккупации и их научная ориентация в условиях вновь обретенной самостоятельности.

С 1940 г. научные учреждения Прибалтики были подчинены централизованному руководству Москвы, связи с зарубежными странами оборвались. Страх перед сталинскими репрессиями заставил в 1944 г. уехать на чужбину приблизительно половину квалифицированных кадров ученых Балтийских стран. Они продолжили свою научную деятельность в различных государствах, главным образом в Германии, Швеции, США, Канаде и Австралии. Большинство ученых, оставшихся на родине, продолжали работать вопреки репрессиям и политике русификации, сохраняя и развивая национальную культуру и науку. Как на родине, так и в эмиграции сформировалось новое поколение ученых. Перестройка и восстановление независимости открыли путь к объединению ученых стран Балтии, а также к широкому развитию научных связей с различными странами. В то же время научные контакты с учеными Востока, в первую очередь России, значительно ослабли.