Jadwiga Dutkiewicz

MIECZYSŁAW WARMUS

Life and academic work

Teresa Siminska
Wollongong 2006

Published in Wollongong, Australia, by
Teresa Siminska
8/28 Kembla Street, Wollongong 2500

First English edition
2006

Translated from Polish
by Dr. Adam Rustowski

Cover design by Jadwiga Dutkiewicz

Photos and documents presented in this book
originate from prof. Mieczysław Warmus's private archives

ISBN 0-646-46844-8

From the author

This book, a biography of Professor Mieczysław Warmus, owes its existence to the initiative of his wife Helena. It is based on original documents sourced directly from Professor Warmus's private archive. The impossibility of direct oral or written contact with Professor Warmus caused by his illness, and the need to bring to light some important stages in Professor Warmus's career, have largely determined the literary and typographical approach to the material at hand. To create a sense of continuity, reproductions of original documents have been placed in chronological order and linked by background commentaries.

Personal recollections of Professor Warmus's wife and his family as well as friends, former students and professional colleagues were very important in providing biographical information. Very helpful were various articles on the history of Polish Informatics, which appeared in recent years in the Polish monthly publication called "Informatyka" and on Internet pages.

It is my hope that this book will not only contribute additional details related to the conception and development of Informatics in Poland but will, above all, document 44 years of Professor Warmus's scholarly and academic work.

This publication is, at the same time, the best present his wife Helena could possibly offer for her husband's 85th birthday.

Jadwiga Dutkiewicz
Wollongong, Australia, August 2003

Acknowledgments and thanks

From the depth of my heart I would like to thank all those who have kindly contributed to this difficult endeavour, which entailed collection and impression in a written form of all the facts and events that related to the active life and scholarly work of my husband Mieczysław.
Particular thanks must go to Professors Władysław Turski, Stefan Paszkowski, Tadeusz Styś and Józef Łukaszewicz. It is largely thanks to their recollections, which enriched the biographical sketch of my husband with many details that have been preserved and saved from oblivion.
I would also like to offer my special vote of thanks to Dr Krystyna Styś, Dr Andrzej Matuszewski, Professor Tadeusz Bogdanik, Dr Jan Zambrzycki, and Dr Rościsław Rabczuk. Their recollections not only contributed additional information but also, in the case of Drs Andrzej Matuszewski and Jan Zambrzycki, substantially suffused the text with some lighter touches thus 'softening' its dry, official and documentary character.
My thanks must also go to Professors Martin Bunder and David Griffiths from the Department of Mathematics, University of Wollongong, and Professor Jürgen Garloff from the University of Konstanz (Germany). Without their valuable contributions this biography would be incomplete.
I would like to thank all the above-mentioned also on behalf of my husband Mieczysław Warmus.
I am indebted to our daughters, Teresa and Bożena, and above all to our son Tomek, for their unwavering support of this work, which during the last two years became the sole aim of my life.

Helena Warmus
Wollongong, Australia, August 2003

As the author of this biography of Mieczysław Warmus, I join wholeheartedly his wife, Helena, in her vote of thanks. I would like to express my growing admiration for her initiative of writing a memorial to the creative works of Professor Warmus. This book owes its existence to her undying determination, organisational skills and impeccable memory.
I would also like to thank my husband Józef Dutkiewicz, who was my first proof-reader, for supporting me in more difficult moments. With his good knowledge of the history of modern Poland he helped me considerably in providing the political background for the events underlying Professor Warmus's professional life.

Jadwiga Dutkiewicz
Wollongong, Australia, August 2003

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Youth

Antiquity was the earliest period when it became customary to describe mathematics as the queen of all sciences. In the modern times the famous American mathematician, teacher and writer, Bell Eric Temple (1883-1960), called one of his books *Mathematics, the Queen and the Servant of all Science* (1951). The title was quite apt and appropriate as there is no science of any kind, which would not be related to mathematics in one way or another. Generally, mathematics is perceived as a very difficult subject. It is the bane of most students and only a small percentage of adults could say that they have never experienced problems with "everyday maths". Hence, people who are blessed with exceptional mathematical abilities are usually the most outstanding members of society and command due respect.
Unarguably, Professor Mieczysław Jan Warmus is a perfect illustration of such an exceptional mathematical talent. It is his life, career and scholarly achievements, recorded in all the original documents, recollections of his wife, family, friends and colleagues that I endeavour to present in this biographical work.

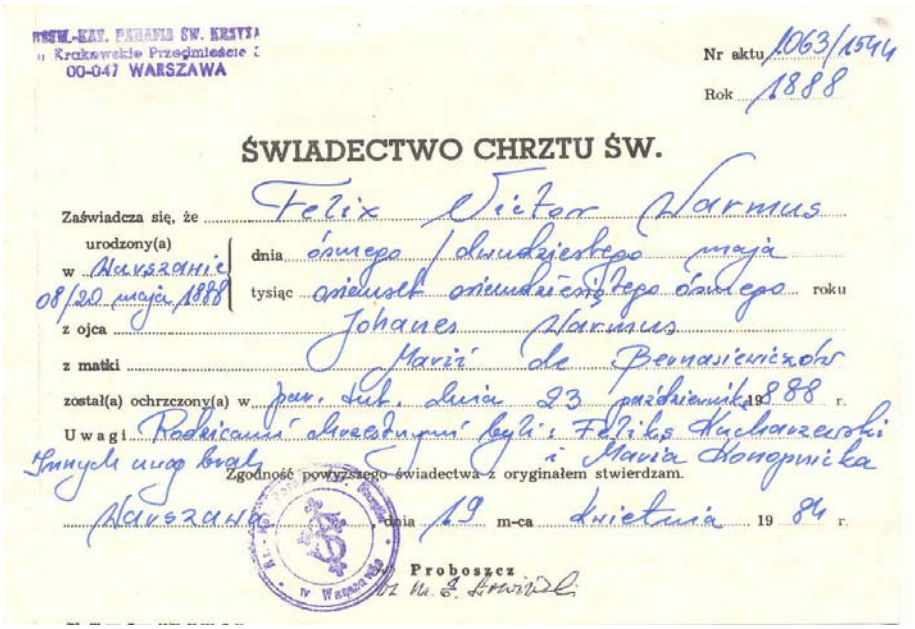
Professor Mieczysław Jan Warmus's home archive organised and maintained with meticulous, mathematical precision, contain a number of yellowing old documents dating back to the 19th century. Two of those documents are end-of-year certificates for the years 1875/76 and 1876/77, issued by St. John's Elementary Six Grade School for Girls in Cracow to Miss Marya Bernasiewicz, the daughter of an artist and painter from Lublin. Those school certificates contain an amazing array of subjects such as two foreign languages (German and French), literature, history of Poland and of the world, natural history, mathematics divided into algebra, geometry and practical maths as well as other subjects including physics, chemistry and geography. Items such as singing, drawing, piano, personal conduct, ability and diligence were only necessary additions to the education of a young lady from a good home.
The next document is the Certificate of Marriage between Jan Warmus and Maria Bernasiewicz dated 26th May 1881 in Cracow.
The newlyweds settled in Warsaw where their first-born son was delivered into this world, and following a longstanding family tradition was given his father's name, Jan. Jan Warmus (the father), young painter and a disciple of the famous master Jan Matejko (1838 - 1893), was already well known for his artistic ability and was a part of the Warsaw bohemian scene.
His young, well-educated, wife was very much her own person, an accomplished poet in her own right, and an emancipist maintaining wide-ranging contacts with other progressively thinking women of that time.
Jan and Maria Warmus enjoyed a close friendship of Maria Konopnicka (1842 - 1910), the famous Polish poetess and novelist of the realist school, the authoress of

Rota. Konopnicka, who at the time lived in Warsaw with her children, published a democratic journal for women called Ś*wit* (*Dawn*). She employed Maria Warmus as her personal assistant.

1. Maria Warmus
(Nee Bernasiewicz, 1859-1940)
Mieczysław Warmus's grandmother

2. Jan Warmus (1852-1924)
Mieczysław Warmus's grandfather

The Birth Certificate of Feliks Wiktor Warmus, the middle son of Jan and Maria, born on the 28th May 1888, whose godparents were Maria Konopnicka and Feliks Kucharzewski, further emphasizes a close nature of the friendship between the two families.



PARAFIA ŚW. KRZYŻA
ul. Krakowskie Przedmieście
00-047 WARSZAWA

Nr aktu 1063/1544
Rok 1888

ŚWIADECTWO CHRZTU ŚW.

Zaświadcza się, że Felix Wiktor Warmus
urodzony(a) w Warszawie 08/20 maja 1888
dnia dwudziestego maja
tysiąc osiemset osiemdziesiątego ósmego roku
z ojca Johanes Warmus
z matki Marii de Bernasiewiczów
został(a) ochrzczony(a) w par. kat. dnia 23 październik 1888 r.
Uwagi Rodzicami chrzestnymi byli: Feliks Kucharzewski i Maria Konopnicka
Innych uwag brak

Zgodność powyższego świadectwa z oryginałem stwierdzam.

Warszawa dnia 19 m-ca kwietnia 19 84 r.

Proboszcz

Document 1. Birth Certificate of Feliks Wiktor Warmus

Jan Warmus, the first-born son of Jan and Maria, grew up together with his siblings surrounded by well-educated people, the intellectuals of that time.
As a young man Jan settled in Poland's eastern territories where for a number of years he was employed as an administrator in several large property estates. In Wysokie on the Dnieper River in Byelorussia, Jan met Miss Anna Krasowska, a French language teacher. Their marriage followed on 17th July 1915 in Szyliwile in Mińsk Province of Byelorussia, the estate owned by Mr. and Mrs. Krasowski.

At the time, Jan, who had already acquired a considerable farming and economic experience, was employed as an administrator in Dobrowlany, in Święciany District, not far from the city of Vilnius. The estate, whose owner, Mr Chomiński, spent most of his time abroad, apart from large tracts of farming land, included also four distilleries. Jan Warmus assumed the responsibility for the whole estate. The position created a favourable financial situation and brought social privileges for the young family. Mieczysław Jan, born on the 1st June 1918, was the second child of Anna and Jan Warmus.

3. Anna Warmus
(nee Krasowska 1887-1959)
Mother of Mieczysław Jan Warmus

4. Jan Warmus (1882-1967)
Father of Mieczysław Jan Warmus

The First World War mercifully bypassed Dobrowlany, where the life of the farming community continued undisturbed despite occasional echoes of distant battles.
It was not until the outbreak of the revolutionary movement in Russia, and the

onslaught of the Bolshevik mighty armies increasingly threatening the Polish eastern territories, that many Polish families began looking for safe refuge in central parts of Poland. In consequence the Warmus family decided to join Jan's father in Warsaw, in 1922. They moved into their father's two-bedroom apartment at 9 Krucza Street.

The end of the I World War created a positive political climate conducive to the restoration of the free and independent Polish state. When the country, after 123 years of foreign rule, at last, regained its independence on the 11th of November 1918, the whole nation was close to exhaustion. The Poles had only one thing on their minds - the onerous task of reconstruction of their war-ravaged country. Political turmoil, both at home and abroad, forced the new Polish government to maintain constant defensive vigilance. There was little time to heal the many wounds of the nation brought about by the prolonged political bondage, as well as the long war in which Poles, from different occupation zones (Russian, German and Austrian), were forced to fight against each other in the uniforms of the occupying powers. The country was suffering from crippling unemployment exacerbated by growing worldwide economic depression.

Such was the economic and political climate at the time when Jan and Anna Warmus and their family decided to settle in Warsaw. Their lifestyle was now radically different to what they had been used to in Dobrowlany. The atmosphere of wealth and privilege of their former lives was only a distant memory.
Jan's professional skills and experience were largely limited to administration of rural estates and he faced enormous difficulties in securing a job of this kind in Warsaw. His wife Anna, a French teacher, was very much in the same predicament. After a brief period of employment with the Society of Eastern Territories, Jan Warmus became unemployed.
Anna bravely endeavoured to provide for the young family by giving French lessons but soon had to give it up. In the prevailing negative economic climate and growing pauperisation of all sections the Polish society, there was a dire shortage of candidates for such luxury as French tuition. Their meagre savings which they managed to bring with them from the east could not last forever.
Anna tutored her children at home preparing them for the Department of Education yearly public examinations covering the elementary school material. It was very much to the credit of the exceptional educational and teaching skills of their mother that the children were so well prepared for the very competitive entrance examinations to two of the best secondary colleges in Warsaw. Both siblings passed the examinations with the highest distinctions. Mieczysław became the student of Stefan Batory College (Gimnazjum Stefana Batorego) and his older sister Janina joined the Queen Hedwig College (Gimnazjum Królowej Jadwigi). During his entire time at the College, Mieczysław was an outstanding student, which merited an ongoing supporting scholarship awarded by the Department of Education. Already at this early stage he distinguished himself by his precocious intelligence and innate

talent for leadership in community life. Mieczysław was always helping his sister, two years his senior, with her maths schoolwork. At Batory College, Mr. Radwański, his tutor and maths teacher, frequently turned to Mieczysław during maths lessons to enlist his assistance when explaining and clarifying some more difficult mathematical problems to his class. During one of the parent-teacher nights at the College, Mr. Radwański told the attending father: "Sir, your son Mieczysław is a mathematical genius".

Young Mieczysław's sphere of interests was not limited to mathematics. He also found time for all manner of pursuits such as studying, reading for pleasure and various leisure activities.

He was learning to play piano under the tutelage of the famous maestro, Professor Rzepka. Mieczysław was widely read in philosophy, had a keen sense of humour and was an accomplished storyteller.

5. Mieczysław Jan Warmus as a Batory College student

Despite his extraordinary mathematical abilities and considerable appetite for absorbing new knowledge, Mieczysław's school days were far from easy. Deteriorating economic situation of the family forced him to undertake paid employment with after school maths tutoring of other students of the College, usually at the recommendation of Mr. Radwański. One of the students tutored in maths by Mieczysław was young Krzysztof Kamil Baczyński (aka Jan Bugaj, 1921-1944), three years his junior in the College. Baczyński later became an eminent poet and a soldier of the underground army fighting in the 1944 Warsaw Uprising against the German occupation. In his poetry, Baczyński painted a sadly moving and tragic picture of the fate of the young generation of Poles, soldiers of the Uprising. He was a soldier in the ranks of the "Parasol" Battalion, comprising mostly young Warsaw scouts, when he was killed by a German bullet.

Mieczysław's income from his tutoring work was of course sadly inadequate. Senator Bogusław Miedziński's (1891-1972) wife, who was very active in the school's Mothers' Circle, intervened and as a result Mieczysław was employed as a proof reader on the editorial staff of the *Gazeta Polska* newspaper at Szpitalna Street in Warsaw. It was an unprecedented occurrence in the history of the College; Mieczysław was the first student ever to obtain work permit from the College. He was 17 years of age at the time and a student of the penultimate year. The job involved night shiftwork and his earnings were the only income and support for the whole family of five. He remained on the staff of *Gazeta Polska* for the following three years, until the 31st of August 1938.

In 1936, after graduating from Batory College with Leaving Certificate, now called

Higher School Certificate (Matura), Mieczysław began his tertiary education at the Faculty of Mechanical Engineering of the Warsaw Polytechnic. During his tertiary studies at the Polytechnic he was involved in activities of the tertiary catholic students' Association *Iuventus Christiana.* The society was led by Father Edward Detkens (1885-1942), who was the academic chaplain and Rector of the Academic Church of St. Anne in Warsaw. The membership of the Association was largely that of the Catholic youth of intelligentsia background. Christian values deeply inculcated by his parents, particularly by his mother, always provided Mieczysław with a sense of direction in life. Shortly before the outbreak of the war he passed the summer exams required for the completion of his second year of studies.

The outbreak of the Second World War totally and profoundly changed the way Polish people went about their lives. In Nazi-occupied Warsaw random round-ups of people in the streets, police raids and ruthless and wanton persecution of Poles by the Gestapo became everyday reality. Underground resistance movement, largely involving patriotic Polish youth, started to form almost immediately after the end of the Polish military campaign.
During the first year of the Nazi occupation of Poland, Mieczysław Warmus took an active part in clandestine underground education. He conducted classes, which prepared young people for their final college exams, and was involved in underground freedom movement. His older sister Janina, suspected of active participation in the underground movement, was arrested and incarcerated in Mokotów Prison and then in the infamous Pawiak prison complex. After twelve months of imprisonment, she was released as the Germans were unable to produce substantial evidence of her underground involvement.

When in 1940 Mieczysław and Janina received a message that the Gestapo had found out about their underground activities, they decided to 'disappear' from the Warsaw scene.
They moved to Lublin District where Mieczysław got himself a job as a clandestine teacher and bookkeeper in the estate of Tarnogóra, owned by Count Władysław Smorczewski.

6. Mieczysław Warmus with his sister Janina. Lublin District, 1941

In 1942 they both returned to Warsaw where Mieczysław found employment as a surveyor with Władysław Kuzan's firm. In 1943 he had to leave Warsaw again. He moved into the country but continued his work as a clandestine teacher tutoring two children of Mrs. E. Dąbrowska, the owner of the Rusinów estate near Radom, preparing the children for their final school exams.
Mieczysław returned to Warsaw just before the outbreak of the Warsaw Uprising in 1944. Under his underground pseudonym *Mruk,* he was involved in armed resistance, fighting in the area of Plac Trzech Krzyży and Książęca Street. After the war he often reminisced about an episode during fighting, when he entered some abandoned apartment featuring a piano in its living room.
With great passion he proceeded to play Polish patriotic melodies ignoring bullets with which a German sniper was trying to silence him and his music. He wanted everyone to know that the Uprising continued and that the young heroes were still alive and fighting.

In the last day of the Uprising he lost his best and closest friend, Stefan Prężyna, also a Batory College alumnus and a student at the same faculty of the Polytechnic. Stefan was shot by a German soldier as he assisted an elderly lady in leaving a burning building.

7. Stefan Prężyna,
Mieczysław's comrade-in-arms and closest friend.

Leadership of Warsaw Uprising staked everything on the presumption that the "brotherly" army (communist) that was idly waiting on the other side of the Vistula river, would intervene and bring immediate relief. However, the First Polish Army, under the orders of Red Army commanders did not get the permission to engage actively in supporting insurgents fighting in the city. Soviet press described the Warsaw Uprising initiated by the Polish Government in Exile as a "political provocation".

On the 2nd of October 1944, the Uprising came to an end and the young heroes had to throw down their arms. The Nazis gave more than million inhabitants of Warsaw a week to evacuate the city completely. According to Hitler's orders, Warsaw, the capital of Poland, was to be razed to the ground. Following the fall of the Uprising, Mieczysław returned to his parents' apartment at 9 Krucza Street.
The Warmus family left Warsaw in the morning of the 9th of October. They were soon caught in the rush of people moving in the direction of Pruszków, where they arrived just before sunset. Behind them was the burning city of Warsaw and loudspeakers barking out orders to leave the city. It was there, in Pruszków, that they became separated. Mieczysław was put into a group of young men surrounded by

German soldiers with dogs. His older sister was incorporated into a group of young women. The third group consisted of old people, the sick and the invalids. This group included Mieczysław's parents together with their disabled youngest daughter Wanda.
The following day Mieczysław's group of young men was herded against the wall to be executed. Other groups had met similar fate before. In the very last moment, a soldier on a motorcycle arrived with a more recent order to load all young people, men as well as women, on to the train lorries. Mieczysław and Janina found themselves pushed and squeezed into an impossibly overloaded cattle lorry and the train began its slow journey to Auschwitz. However, it was not their destiny to end up there. After the whole day at the gates of the infamous Death Camp, the transport was redirected westwards to Germany and Austria. Young slave labour was more needed there.
Janina was taken as a slave labourer to Leipzig, Mieczysław ended up digging trenches not far from Vienna. After some time, he managed to run away and join his sister. Together they waited for the end of the war. Janina and her fiancé Włodzimierz Bołaszewski, a prisoner of war, decided to remain in the West, while Mieczysław was determined to return to Poland. He arrived in Poland with the first repatriation transport in October 1945. While still a slave labourer in Germany, he received a message that his parents had been forced by the Nazi German administration to settle in Proszowice, not far from Cracow.

Warsaw was in ruins, totally empty. After a short visit at his parents' place, he proceeded to the city of Łódź, where he reported to the administration of the Łódź Polytechnic.

Politechnika Łódzka
Łódź dn. 29. V. 1945
L.dz. 590-390/45/M
Plac Zwycięstwa 2

Z a ś w i a d c z e n i e

Niniejszym poświadczamy, że ob. Warmus Mieczysław
ur. 1. VI. 1918 r. jest studen
tem Wydziału Mechanicznego sem. piątego
Politechniki Łódzkiej.
Zaświadczenie wydaje się celem przedłożenia władzom :
~~Kolejowym~~ - Wojskowym.

POLITECHNIKA ŁÓDZKA

za Sekret.

It was one of the first tertiary education institutions in Poland, which resumed its educational activities after the war.
As early as October 1945 Mieczysław was able to resume his studies at the fifth semester at the Faculty of Mechanical Engineering, Łódź Polytechnic.

Document 2. Student certificate from the Łódź Polytechnic, 1945

The beginnings of a career
Wrocław 1946 - 1958

The post war years were characterized by an enormous rush of activities as if people were trying to recover the lost time, lost opportunities, hopes and aspirations so brutally fractured by the long war. The whole nation spontaneously joined in the reconstruction effort. Rebuilding the education system was also taking place.

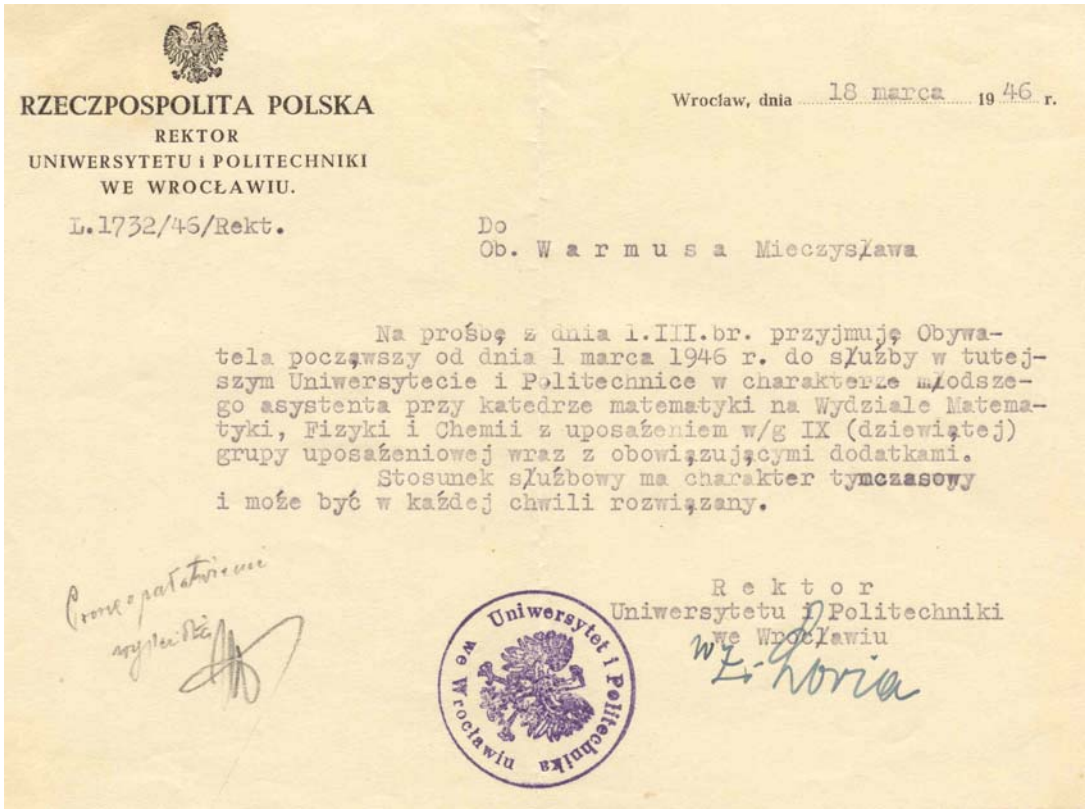
The maps of post-war Europe showed the new Polish national borders sketched so insouciantly by the world powers deliberating in Yalta. These new borders left out Lwów (now in the Ukraine), the second most important academic centre of pre-war Poland. Instead, the world powers decided to cede to Poland the much-destroyed city of Wrocław, with its beautiful, old university buildings standing uninhabited and lifeless amongst the ruins.
The years 1945 - 46 in Poland can be described as the transition years. The term encompasses both the interminably long lines of railway goods lorries filled with human cargo, which were shifting Polish population from the "lost" eastern territories to the newly acquired land in the west, the so called "Recovered Territories". There were equally long trains evacuating the expelled local German population to the west, to Germany.
What was left in Lwów was only the infrastructure - the buildings of the Jan Kazimierz University. The cultural and academic heritage was "evacuated" together with the Polish inhabitants of the city. The most eminent professors, teachers, researchers and the University administration were all transplanted to Wrocław. Most of these people were highly qualified academics, often with respectable European scholarly credentials.
The academics were keen to establish a new university centre in the buildings, which today are known as the Wrocław University. As a result, as early as November 1945, Wrocław had a functioning academic institution called initially the University and Polytechnic of Wrocław. (Later, that organisation was split into two academic institutions, University and Polytechnic. The later is now called Wrocław University of Technology).
The whole country knew that the personnel of the new University consisted mostly of former academic staff of the University of Lwów. Thus the newly created University did not have to work for wider recognition. It inherited the enviable academic reputation of Lwów University, which turned out to be a huge magnet for the education-deprived masses of young Poles.

In 1946, Mieczysław Warmus, then a student at Łódź Polytechnic, attended skiing championships, his favourite sport, held in Karpacz. As he was so close to the city of Wrocław, he decided to check out for himself the already famous centre of new academic life. This short visit was to become a turning point of his entire life.

Following his particular interests, he paid a visit to the Faculty of Mathematics, Physics and Chemistry created and led by its long-time Dean, Hugo Steinhaus (1887-1972). This eminent scientist, mathematician, full professor of the Jan Kazimierz University in Lwów, one of the founding fathers of the Lwów school of mathematics and the initiator and long-time editor of the scientific journal *Studia Mathematica* (1929), managed to gather around him a sizable group of extremely able and well-known scholars.

When Mieczysław visited the Office of the Faculty Dean, Professor Steinhaus conducted a brief interview with him during which he asked the young man some maths related questions and, quite unexpectedly, offered Mieczysław the position of his first assistant…

It must be remembered that the young man was, at the time, only a 5th semester student of the Faculty of Mechanical Engineering of the Łódź Polytechnic. He was still five semesters and a master thesis away from achieving his Master of Science degree, which normally was a precondition for such an academic appointment. Another serious complication was that there were considerable differences in faculty curricula between mechanical engineering courses offered by a polytechnic and mathematics degree offered by a university.



RZECZPOSPOLITA POLSKA
REKTOR
UNIWERSYTETU i POLITECHNIKI
WE WROCŁAWIU.

Wrocław, dnia 18 marca 1946 r.

L.1732/46/Rekt.

Do
Ob. W a r m u s a Mieczysława

Na prośbę z dnia 1.III.br. przyjmuję Obywatela począwszy od dnia 1 marca 1946 r. do służby w tutejszym Uniwersytecie i Politechnice w charakterze młodszego asystenta przy katedrze matematyki na Wydziale Matematyki, Fizyki i Chemii z uposażeniem w/g IX (dziewiątej) grupy uposażeniowej wraz z obowiązującymi dodatkami.
Stosunek służbowy ma charakter tymczasowy i może być w każdej chwili rozwiązany.

Rektor
Uniwersytetu i Politechniki
we Wrocławiu
W. Lichoria

Uniwersytet i Politechnika we Wrocławiu

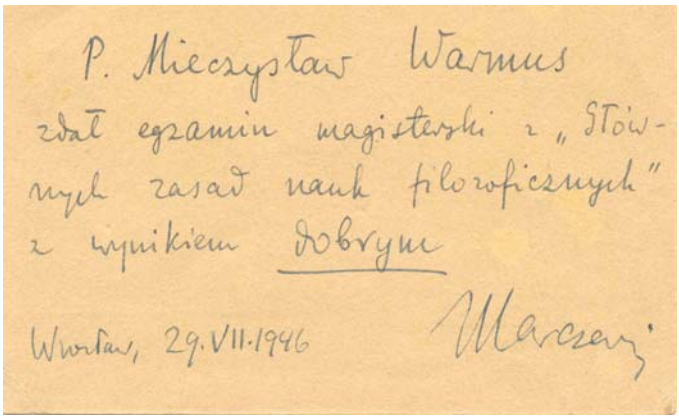
Document 3. Employment contract

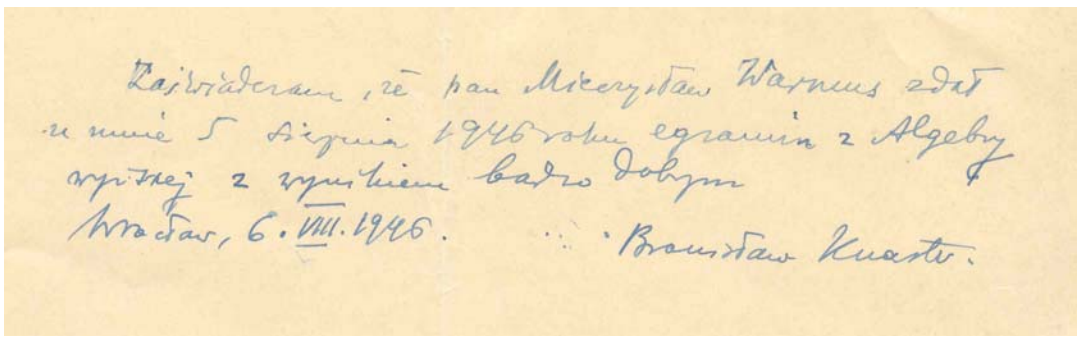
In hindsight, it is obvious that Professor Steinhaus was not only an outstanding mathematician but was also very perceptive in recognizing and identifying exceptionally gifted students. He was not disappointed by his instincts in the case of his newest assistant.

Mieczysław Warmus was confirmed in his new academic position as a junior assistant in the Faculty of Mathematics, Physics and Chemistry as of the 1st of March 1946.

In the course of seven months that followed, Mieczysław passed all exams required of an external maths student to become, as he used to say, a mathematician without ever being a student of the Faculty of Mathematics.

Among his examiners were such prominent academics as Professors Hugo Steinhaus, Bronisław Knaster, Władysław Ślebodziński and Edward Marczewski.


P. Mieczysław Warmus
zdał egzamin magisterski z „Stów-
nych zasad nauk filozoficznych"
z wynikiem dobrym
Wrocław, 29.VII.1946 Marczew


Zaświadczam, że pan Mieczysław Warmus zdał
ze mnie 5 lipca 1946 roku egzamin z Algebry
wyższej z wynikiem bardzo dobrym
Wrocław, 6. VIII. 1946. Bronisław Knaster

Documents 4 and 5.

Philosophy exam for Mieczysław Warmus's MA degree and Advanced Algebra exam result

Almost simultaneously Mieczysław Warmus began his own mathematical research. As early as 1946, the journal *Comptes-Rendus de la Société Polonaise de Mathematique*, XIX, p. 233, published two of his articles:

1. M. Warmus, *Un theorème sur la poursite* [List of publications, item 1]
2. Steinhaus, H. et Warmus, M., Quelques theorèmes sur le jeux [item 2]

In April 1946, Mieczysław became a member of the Polish Mathematical Society.
As soon as his appointment at the University of Wrocław was confirmed, he decided to bring to Wrocław his entire family, including his younger sister, who was disabled and required continuous care.
His father, Jan Warmus, soon found employment in the local Trades Hall. Mieczysław's salary as an assistant to a professor was rather meagre and sadly inadequate to cover even the most basic needs of everyday life.

Preparatory courses for those intending to sit university entrance examinations were the only source of additional income. The university organized these courses for secondary school students.

8. Anna Warmus, Mieczysław's mother
Warszawa, ca 1938

9. Jan Warmus, Mieczysław's father
Wrocław, ca 1946

Mieczysław Warmus never joined any of the new post-war political organizations, which did not go unnoticed by the politically appointed University authorities. He continued to play an active part in various Catholic organizations despite worsening anti-religious political climate. The communist-dominated new authorities in the country subjected those that openly declared their religious beliefs to relentless persecution. Mieczysław, in collaboration with a colleague and a friend, Józef Łukaszewicz, founded Wrocław chapter of the youth organization *Iuventus Christiana*, which continued a long-standing tradition going back to pre-war Poland. Together they provided leadership for the organization for the next three years until the communist government introduced a new law, which banned outright all organizations affiliated with the Polish Catholic Church.
It was during a special May Mass in a beautiful, little church of Redemptorist Brothers in Szymanowski Street in suburban Sępolno, when Mieczysław's attention was caught by a young female student from the Caritas students' house.

Father Marian Pierożyński, a very prominent figure in the academic life of post-war Wrocław, was the spiritual leader and the founding father of the Caritas student's house. After the II World War, there were many young people that have lost everything in the war, their families and possessions.

Many of them came to Wrocław in a search for work and education. Father Pierożyński was actively involved in helping those people, finding work for them, placing them in student's accommodation and by maintaining contact with them during their studies.

Not surprisingly, Father Marian Pierożyński was well known and well regarded in the academic circles. Mieczysław Warmus asked the Father to introduce him to the young student that had attracted his attention during the service. It was on the 30th of May 1946. Fifty seven years later his wife Helena remembered:

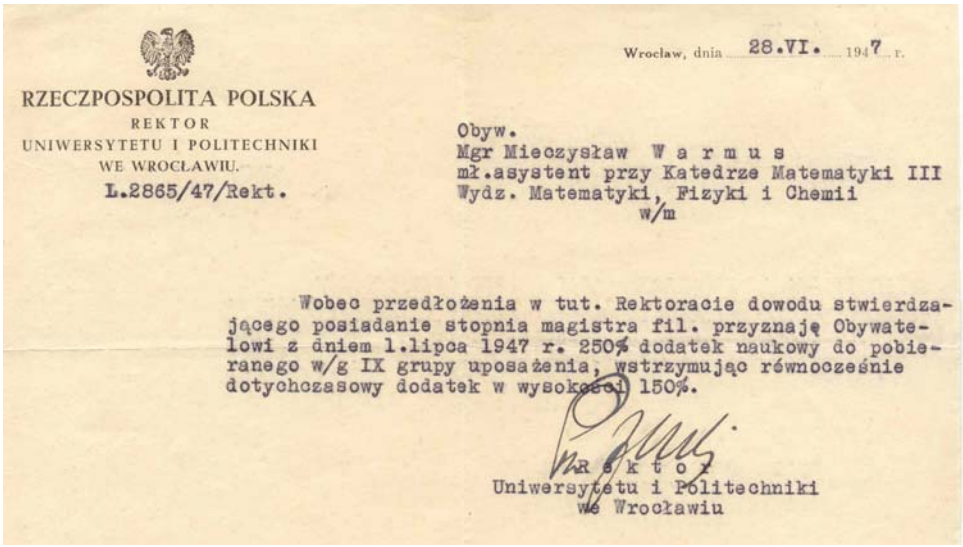
After the Mass on the 30th of May 1946, Father Marian Pierożyński introduced to my group of female students, from the Caritas student house, Mr Mieczysław Warmus, a young and very promising assistant from the Faculty of Mathematics of the Wrocław University . The following day there was a religious pilgrimage to Bardo Śląskie and we both participated. It was then that we conversed for the first time. On the 13th of June that year Mietek (Mieczysław) invited me for afternoon tea to his parents place and on the 1st of September he asked me to marry him.

10. Mieczysław Jan Warmus
Wrocław, 1947

11. Helena Saruchanowska
Wrocław, 1947

Father Pierożyński put her up in the Caritas House and arranged a job for her in the *Postęp (Progress)* bookshop as well as distributing and selling for the Catholic weekly *Tygodnik Powszechny*. This enabled her to undertake her studies at the Academy of Commerce.
The wedding of Mieczysław Jan Warmus and Helena Saruchanowska took place on 6th of January 1947 in the same old church of Redemptorist Brothers in Sępolno where Mieczysław first noticed Miss Helena. It goes without saying that Father Marian Pierożyński was asked to officiate at the ceremony. The beginning of January of that year saw the introduction of the new Civil Marriages Act. The young couple chose Polanica Zdrój for their honeymoon. They are listed in that local Registry Office as a couple number one, under the 9th of January Register entry.

Following finalization of his Master of Philosophy degree, on the 28th of June 1947 Mieczysław Warmus received research supplement to his academic salary.



RZECZPOSPOLITA POLSKA
REKTOR
UNIWERSYTETU I POLITECHNIKI
WE WROCŁAWIU.
L.2865/47/Rekt.

Wrocław, dnia 28.VI. 1947 r.

Obyw.
Mgr Mieczysław W a r m u s
mł.asystent przy Katedrze Matematyki III
Wydz. Matematyki, Fizyki i Chemii
w/m

Wobec przedłożenia w tut. Rektoracie dowodu stwierdzającego posiadanie stopnia magistra fil. przyznaję Obywatelowi z dniem 1.lipca 1947 r. 250% dodatek naukowy do pobieranego w/g IX grupy uposażenia, wstrzymując równocześnie dotychczasowy dodatek w wysokości 150%.

R e k t o r
Uniwersytetu i Politechniki
we Wrocławiu

Document 6. Scholarly supplement

His degree also entitled him to apply to the Ministry of Education for much needed funds to finance his scholarly research. His salary, even with the new supplement, was sadly inadequate to support his growing young family soon expecting the birth of their first child.

On the 18th of September 1947 their first daughter Teresa was born. Since that moment, Helena's primary role was that of mother and wife, to create a comfortable home situation supporting and facilitating her husband's research work.
Quick to recognize her husband's abilities and scholarly potential, Helena decided to sacrifice her own career to be able to create a family situation conducive to nurturing further development of the young mathematician's talents.

Enormous amounts of work did not stand in Mieczysław's way of fulfilling his family duties. Old photo albums reveal the smiling faces of his wife and daughter as well as his parents. Many of the photographs show the Warmus family enjoying nature. These are the photographs which Mieczysław himself was taking; all chronologically arranged and always appropriately annotated. This was yet another example of his ability to divide his time to many activities and indication of his systematic approach to everything he did, which he displayed even in school years as a young student at Batory College, as remembered by his sister Janina. This characteristic came fully to fruition in his adult life.

Young Mieczysław also took keen interest in literature, music and theatre. His painting talent inherited from his great-grandfather Bernasiewicz and his grandfather Warmus, found an appropriate outlet in the beautiful mural paintings of scenes from fairytales on the children bedroom walls. These were paintings based on the illustrations from the popular children's book, by Maria Konopnicka, "*Na Jagody*". Other murals presenting the beauty of natural scenes were the main feature of the dining room of the family home.

12. One of the three-fairytale scenes on the walls of children's bedroom

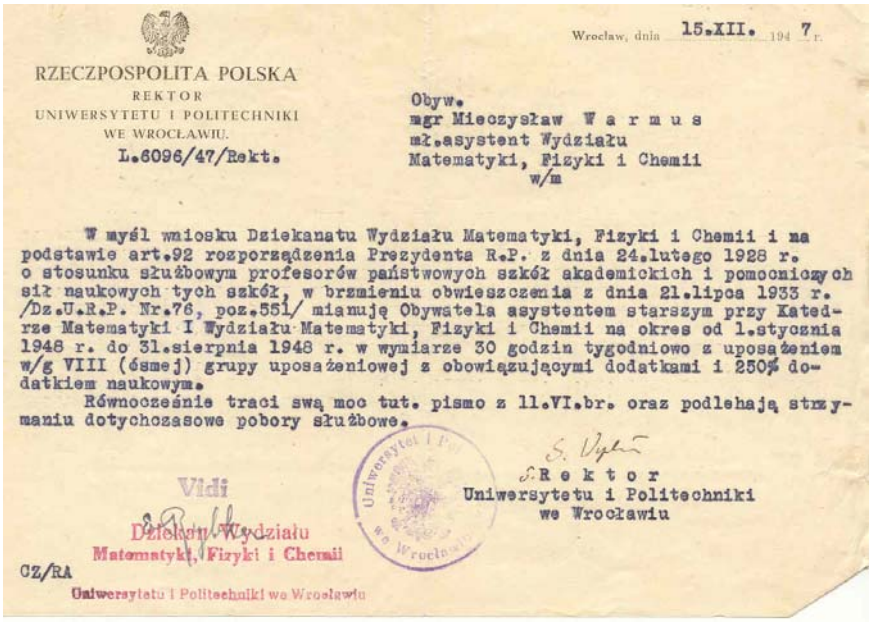
13. & 14. Fairytale scenes adorning the walls of the children's bedroom

15. Painting on the dining room wall

On the 30th of October 1947, Mieczysław Warmus MA sent an application for a grant to the Ministry of Education. He hoped that the grant would free him from having to undertake additional work to supplement his meagre income and would allow him to devote his entire time to scientific research.
The application was supported by Dr. Edward Marczewski, Professor at Wrocław University and Polytechnic, who wrote:

Mgr Warmus has begun his research into calculation of two-dimensional areas with the use of square nets and other calculation methods and has achieved some new and valuable results in this area. He is publishing initial results in the first volume of the journal "Colloquium Mathematicum"...
...It is worth noting that Mr. Warmus's work belongs to the area of applied mathematics, a discipline which has so far been largely neglected in Poland and which has enormous importance in technology, biology etc.

The request found favour with the authorities and the letter of the 9th of December 1947 from the Ministry of Education brought good news that Mieczysław was offered a grant to continue his academic research. This seemed to be the turning point as from that moment Mieczysław's career took on an incredible speed.
In the years 1947 - 1948 Mieczysław published the next four scientific articles [items 3, 4, 5 and 6]. Three of those articles appeared in *Colloquium Mathematicum,* and the fourth in *Matematyka Nr 1.* In 1949 at the 7th Polish and the 3rd Czechoslovakian Conference of Mathematicians in Prague, Mieczysław presented his paper entitled "Computation of two-dimensional areas with the use of parallelogram nets" [item 7].



RZECZPOSPOLITA POLSKA
REKTOR
UNIWERSYTETU I POLITECHNIKI
WE WROCŁAWIU.
L.6096/47/Rekt.

Wrocław, dnia 15.XII. 1947 r.

Obyw.
mgr Mieczysław W a r m u s
mł.asystent Wydziału
Matematyki, Fizyki i Chemii
w/m

W myśl wniosku Dziekanatu Wydziału Matematyki, Fizyki i Chemii i na podstawie art.92 rozporządzenia Prezydenta R.P. z dnia 24.lutego 1928 r. o stosunku służbowym profesorów państwowych szkół akademickich i pomocniczych sił naukowych tych szkół, w brzmieniu obwieszczenia z dnia 21.lipca 1933 r. /Dz.U.R.P. Nr.76, poz.551/ mianuję Obywatela asystentem starszym przy Katedrze Matematyki I Wydziału Matematyki, Fizyki i Chemii na okres od 1.stycznia 1948 r. do 31.sierpnia 1948 r. w wymiarze 30 godzin tygodniowo z uposażeniem w/g VIII (ósmej) grupy uposażeniowej z obowiązującymi dodatkami i 250% dodatkiem naukowym.
Równocześnie traci swą moc tut. pismo z 11.VI.br. oraz podlegają strzymaniu dotychczasowe pobory służbowe.

S. Vyle
R e k t o r
Uniwersytetu i Politechniki
we Wrocławiu

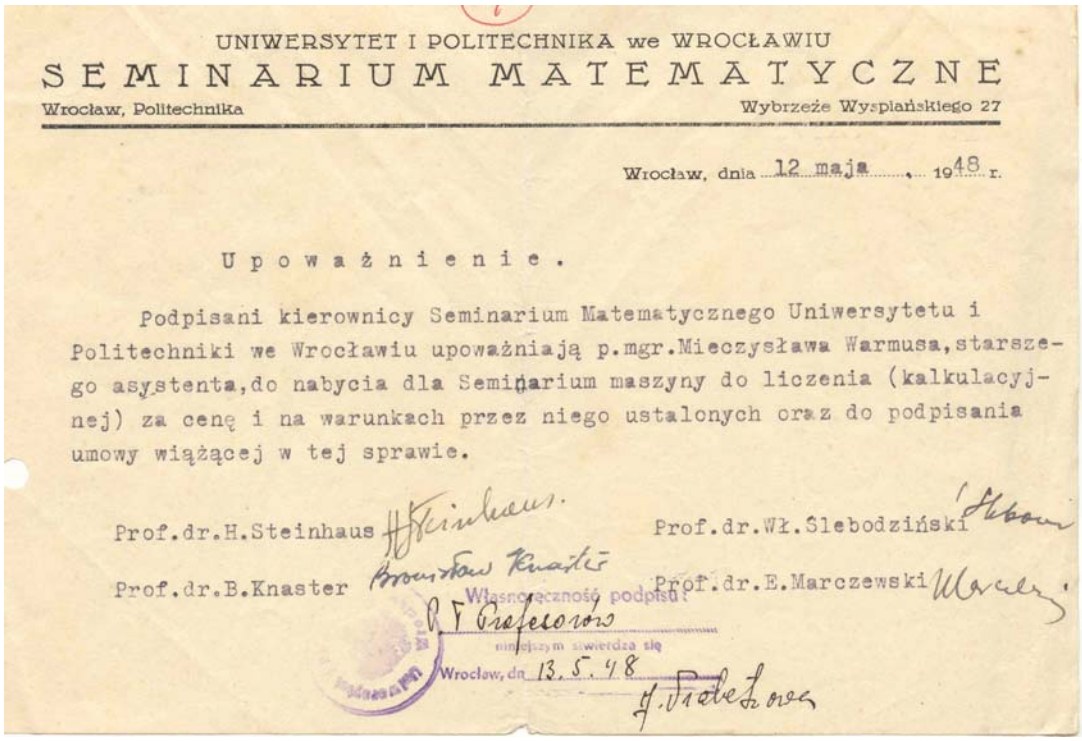
Vidi
Dziekan Wydziału
Matematyki, Fizyki i Chemii

CZ/RA

Uniwersytetu i Politechniki we Wrocławiu

Document 7. Letter of appointment (senior assistant)

From the 15th of December 1947, he held the position of a senior assistant at the Faculty of Mathematics I, and from the 1st of September 1948 - at the Faculty of Mathematics V.
From the beginning of his research work at the Faculty of Mathematics at the University and Polytechnic of Wrocław, Mieczysław Warmus took particular interest in computation machines. In 1948, he was instrumental in purchasing an electric computation machine for the Mathematical Seminar at the University and the Polytechnic.



UNIWERSYTET I POLITECHNIKA we WROCŁAWIU

SEMINARIUM MATEMATYCZNE

Wrocław, Politechnika — Wybrzeże Wyspiańskiego 27

Wrocław, dnia 12 maja 1948 r.

Upoważnienie.

Podpisani kierownicy Seminarium Matematycznego Uniwersytetu i Politechniki we Wrocławiu upoważniają p.mgr.Mieczysława Warmusa,starszego asystenta,do nabycia dla Seminarium maszyny do liczenia (kalkulacyjnej) za cenę i na warunkach przez niego ustalonych oraz do podpisania umowy wiążącej w tej sprawie.

Prof.dr.H.Steinhaus — Prof.dr.Wł.Ślebodziński

Prof.dr.B.Knaster — Prof.dr.E.Marczewski

Własnoręczność podpisu

Wrocław, dn. 13.5.48

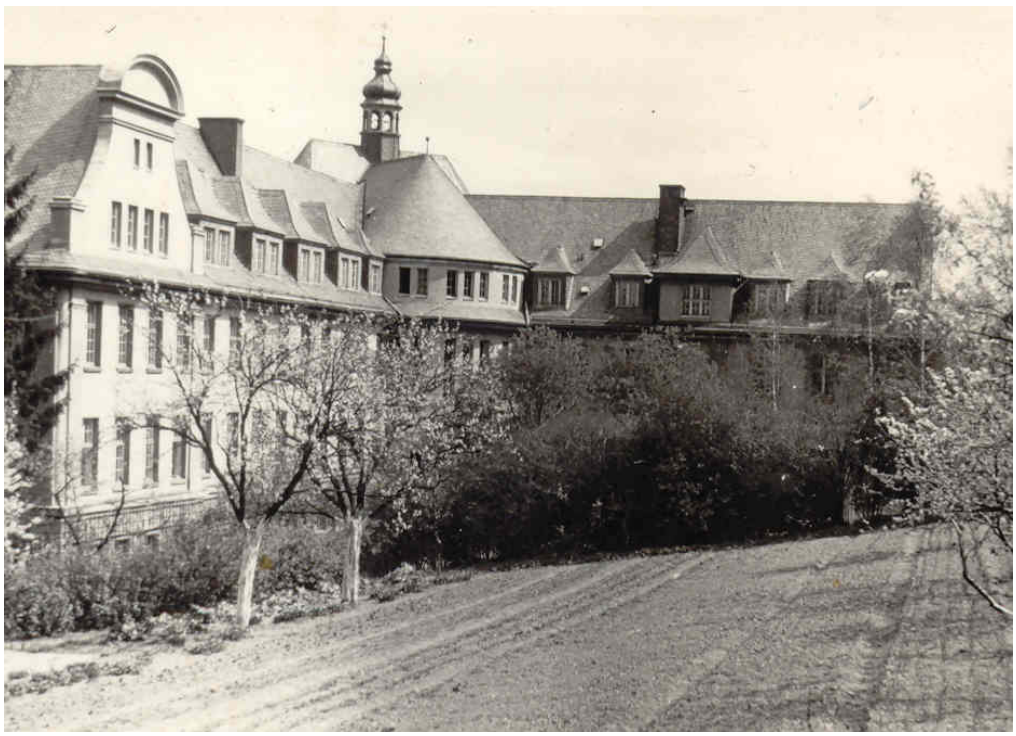
Document 8. An authorization for the purchase of a computation machine

In 1948, Professor Hugo Steinhaus put forward Mr. Warmus's name for the overseas scholarship in the United States. The communist authorities rejected his candidature; they obviously had their own people to promote.

The first post-war years in Poland were filled with anxieties of all kinds. The reigning Party (PZPR) extracted social "support" for its rule by creating the atmosphere of terror and fear and by brutal political violence. The Ministry of Internal Security, in charge of the country's security and internal order, successfully prevented any expression of discontent and any social protest directed against the communist rule, which the authorities termed "people's rule".
For the communists, the real enemies were those Poles who were, before the war, actively involved in community and social organizations and who, during the war, were fighting the occupying German Nazi regime in organizations such as The

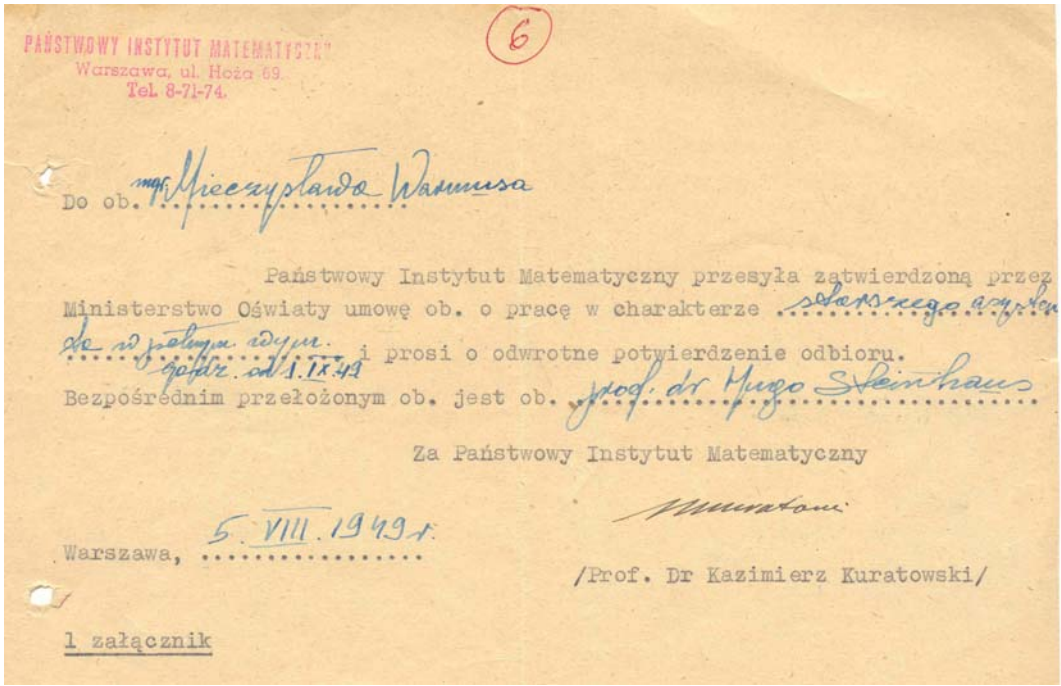
Home Army (Armia Krajowa - AK), which operated under the authority of the Polish Government in Exile, based in London.

The political terror intensified particularly during the years 1948-1949, when the security forces engaged in widespread purges of all those who had fought in the Warsaw Uprising in the ranks of "Szare Szeregi"(Polish Scouting movement) or as soldiers of the underground Home Army (AK).
When in the second half of the year 1948, some of Mieczysław Warmus's friends from the Warsaw Uprising were arrested, he received a warning that internal security people and the communist police turned their interest also to his person. The young couple decided to leave the city and wait out the wave of arrests somewhere in the country.
Together with their eleven months old daughter Teresa (affectionately called Terenia), they found refuge in the St. Ursula Convent in Bardo Śląskie near Kłodzko. There they spent their enforced and unplanned six-week-long "holiday". Mieczysław spent the entire period on intensive research work. When they returned to Wrocław in September 1948, all seemed quiet again. Some time later they received news that a number of senior scouts from Batory College, who had fought in the Warsaw Uprising, were imprisoned in the spring of 1949.



16. St. Ursula Convent - Bardo Śląskie/Kłodzko

In October 1948, the Chancellor of the University and Polytechnic of Wrocław asked Mr. Warmus to lecture in mathematics in the Preparatory College of the Polytechnic in the academic year 1948/49. From February 1949 he also lectured in applied mathematics in the Faculty of Engineering.
The newly created state Institute of Mathematics in Warsaw, which was formally Mr. Mieczysław Warmus's employer, in a letter dated 5th August 1949 appointed him to the position of Senior Assistant to Professor Hugo Steinhaus, effective from the 1st of September 1949.



PAŃSTWOWY INSTYTUT MATEMATYCZNY
Warszawa, ul. Hoża 69
Tel. 8-71-74.

6

Do ob. mgr Mieczysława Warmusa

Państwowy Instytut Matematyczny przesyła zatwierdzoną przez Ministerstwo Oświaty umowę ob. o pracę w charakterze starszego asystenta do wydziału ogólnego i prosi o odwrotne potwierdzenie odbioru.
Bezpośrednim przełożonym ob. jest ob. prof. dr Hugo Steinhaus

Za Państwowy Instytut Matematyczny

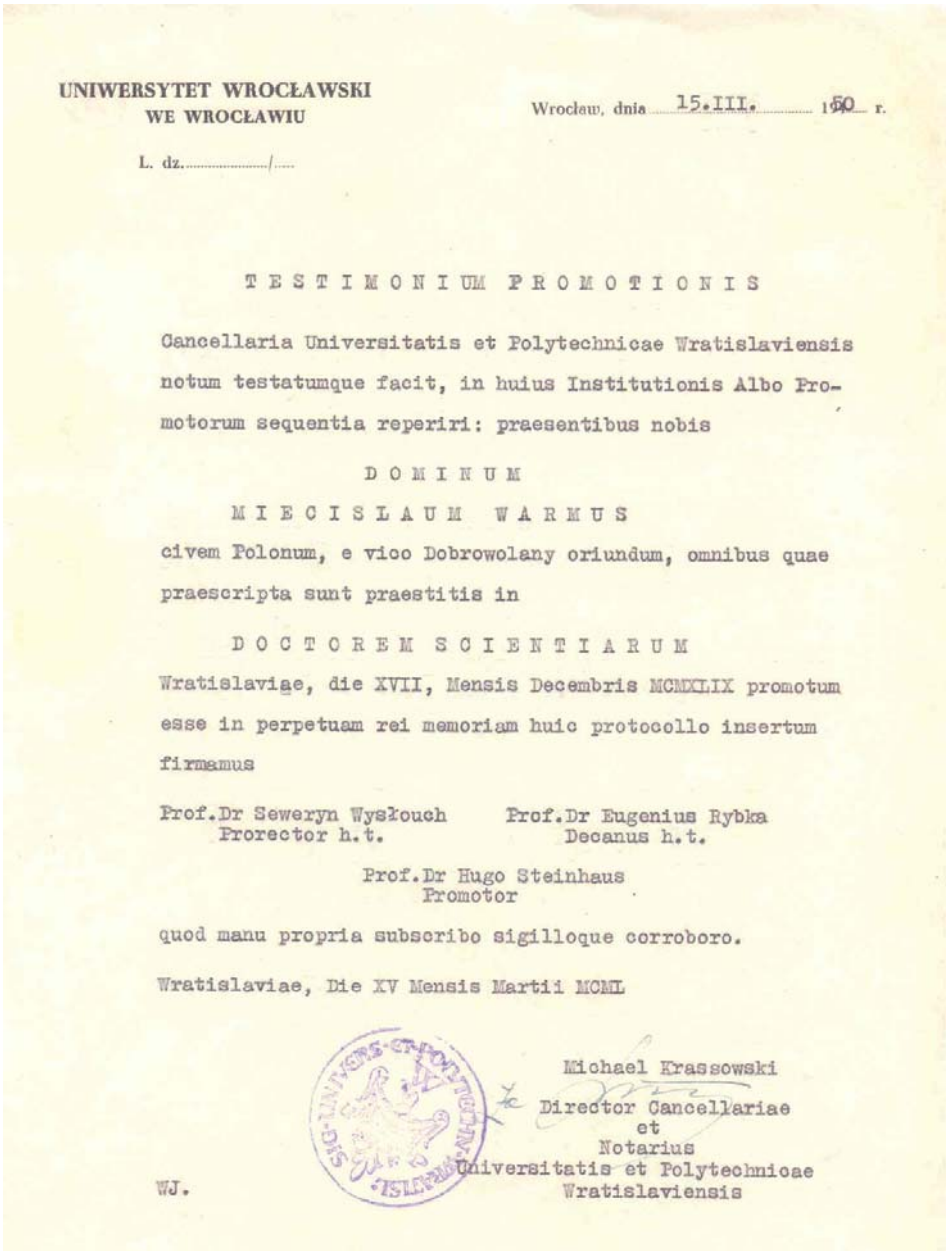
Warszawa, 5. VIII. 1949 r.

/Prof. Dr Kazimierz Kuratowski/

1 załącznik

Document 9. Letter of appointment

Professor Hugo Steinhaus, academic supervisor of Mr. Mieczysław Warmus's doctoral studies, presented Mr. Warmus's doctoral dissertation entitled: "O obliczaniu pól obszarów płaskich za pomocą siatek równoległobocznych" (On computation of two-dimensional areas with the use of parallelogram nets). This presentation took place during the joint session of the Department of Mathematics and Sciences and the Department of Medical Sciences of the Wrocław Scientific Society (Wrocławskie Towarzystwo Naukowe). On the 15th of March 1950, Mieczysław Warmus, Master of Science, received the degree of Doctor of Sciences from the Wrocław University . The doctoral dissertation, by some strange twist of fate (or by the decision of the communist authorities), was not published until six years after it had been sent to the printers. It was eventually published in *Prace Wrocławskiego Towarzystwa Naukowego*, (Proceedings of the Wrocław Scientific Society), Seria B, Nr 27, Wrocław 1955, p.60 [item 14].



UNIWERSYTET WROCŁAWSKI
WE WROCŁAWIU

Wrocław, dnia 15.III. 1950 r.

L. dz. ...../.....

T E S T I M O N I U M P R O M O T I O N I S

Cancellaria Universitatis et Polytechnicae Wratislaviensis notum testatumque facit, in huius Institutionis Albo Promotorum sequentia reperiri: praesentibus nobis

D O M I N U M

M I E C I S L A U M W A R M U S

civem Polonum, e vico Dobrowolany oriundum, omnibus quae praescripta sunt praestitis in

D O C T O R E M S C I E N T I A R U M

Wratislaviae, die XVII, Mensis Decembris MCMXLIX promotum esse in perpetuam rei memoriam huic protocollo insertum firmamus

Prof.Dr Seweryn Wysłouch
Prorector h.t.

Prof.Dr Eugenius Rybka
Decanus h.t.

Prof.Dr Hugo Steinhaus
Promotor

quod manu propria subscribo sigilloque corroboro.

Wratislaviae, Die XV Mensis Martii MCML

Michael Krassowski
Director Cancellariae
et
Notarius
Universitatis et Polytechnicae
Wratislaviensis

WJ.

Document 10. Doctoral Diploma

Following his doctorate, Mieczysław Warmus devoted even more energy to his academic work. In March of 1950, he was appointed to conduct lectures and tutorials in the academic year 1950/51 at the Faculty of Electrical Engineering, School of Engineering of the Supreme Council of Engineers (NOT) in Wrocław.

POLITECHNIKA WROCŁAWSKA
Wrocław, ul. Wybrzeże Wyspiańskiego nr 27
tel. 270-51 wewn. 311

Nr S/20/2/61-62 Wrocław, dnia 18 września 1962r.

Z a ś w i a d c z e n i e .

Na podstawie akt archiwalnych /Sygn.akt 64/2 - Lp.288/stwierdza się, że ob.dr Mieczysław W a r m u s, urodz.1 czerwca 1918r.był zatrudniony w Szkole Inżynierskiej Naczelnej Organizacji Technicznej we Wrocławiu prowadząc wykłady i ćwiczenia zlecone w roku szkolnym 1950/51 w czasie od 1 września 1950r.do dnia 31 sierpnia 1951r.
Zaświadczenie wydaje się na prośbę Ob. dr. Mieczysława Warmusa.

POLITECHNIKA WROCŁAWSKA WE WROCŁAWIU

Dyrektor Administracyjny
Weronika Wycichowska

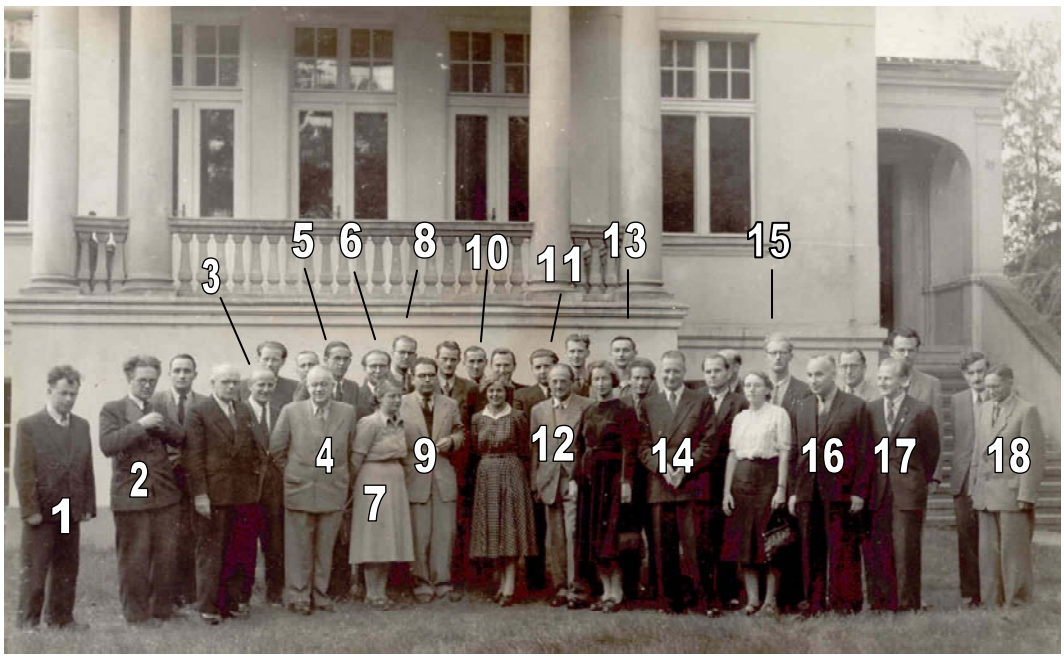
Document 11. Certificate of Employment at the Faculty of Electrical Engineering

17. Dr. Mieczysław Warmus (in the centre) with his students;
School of Engineering NOT in Wrocław; academic year 1950/51

Bożena, the second daughter of Mr. and Mrs. Warmus, was born on the 17th of April 1950 and brought much joy to the entire family, particularly to her older sister Teresa.

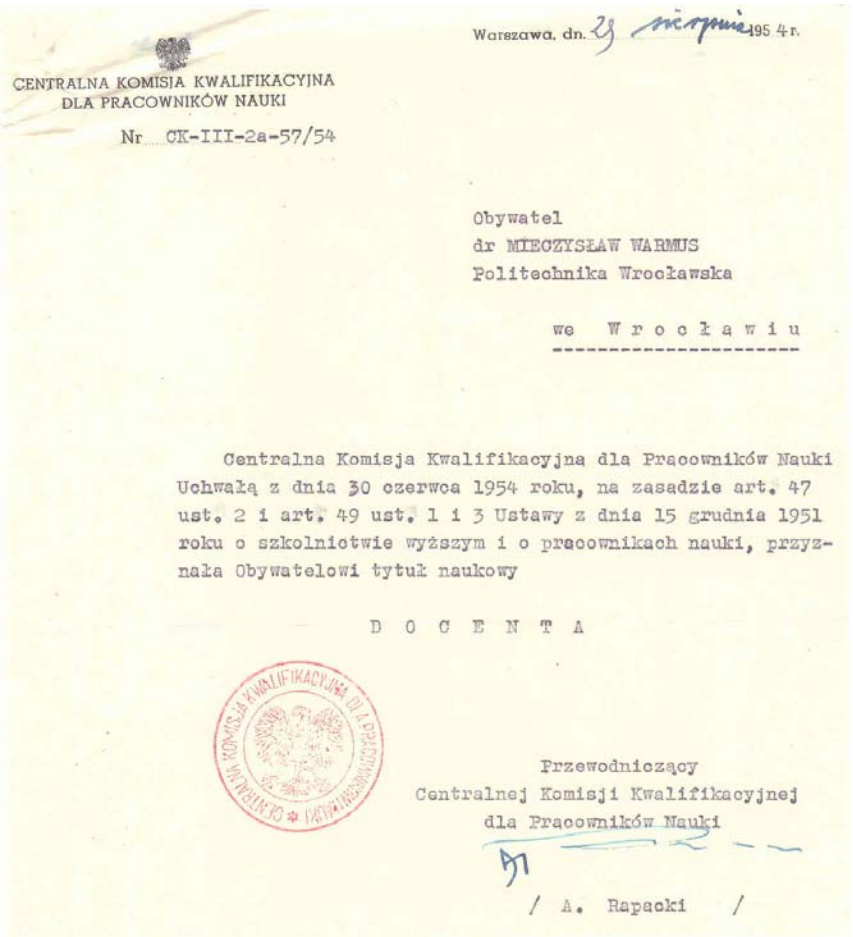
18. Bożena Warmus with her older sister Teresa
Wrocław, 1950.

Mieczysław worked for the Wrocław Chapter of the Institute of Mathematics of the Polish Academy of Sciences (PAN) from its inception. The Institute frequently organized conferences and seminars for mathematicians from the Wrocław scientific community who formed the well-known *Wrocław school of mathematics*.



19. Staff of the Wrocław Chapter of the Institute of Mathematics of PAN; 17 Kopernika Street (previously Leśna), in the years 1952-55: 1.Henryk Fast, 2.Leon Leśmianowicz, 3.Stefan Drobot, 4.Tadeusz Ważewski, 5.Czesław Ryll-Nardzewski, 6.Andrzej Aleksiewicz, 7.Maria Nosarzewska, 8.Ryszard Krasnodębski, 9.Jan G.Mikusiński, 10.Mieczysław Warmus, 11.Kazimierz Urbanik, 12.Hugo Steinhaus, 13.Stefan Zubrzycki, 14.Edward Marczewski, 15.Krzysztof Tatarkiewicz, 16.Marek Fisz, 17.Józef Łukaszewicz, 18.Mirosław Krzyżański.

In the period between the 1st of October 1951 and the 31st of August 1953, Dr. Mieczysław Warmus held the position of Assistant Professor at the Faculty of Mathematics, at the Wrocław Polytechnic, which in 1951 became a separate tertiary academic institution.
From December 1953 Dr. Warmus, together with professors Stefan Drobot and Jan Mikusiński, on behalf of the Wrocław Chapter of the Polish Mathematical Society conducted a *Series of Popular Lectures on Mathematics* in Room 106 of the main building of the Wrocław Polytechnic, at No 27 Wybrzeże Wyspiańskiego. Those free public lectures were held on Saturdays and were designed to popularise mathematics in the wider circles of the community.
On the 30th of June 1954, the National Committee for Academic Appointments and Promotions awarded Dr. Mieczysław Warmus the title of *Docent.*



Warszawa, dn. 23 sierpnia 195 4 r.

CENTRALNA KOMISJA KWALIFIKACYJNA
DLA PRACOWNIKÓW NAUKI

Nr CK-III-2a-57/54

Obywatel
dr MIECZYSŁAW WARMUS
Politechnika Wrocławska

we W r o c ł a w i u

Centralna Komisja Kwalifikacyjna dla Pracowników Nauki Uchwałą z dnia 30 czerwca 1954 roku, na zasadzie art. 47 ust. 2 i art. 49 ust. 1 i 3 Ustawy z dnia 15 grudnia 1951 roku o szkolnictwie wyższym i o pracownikach nauki, przyznała Obywatelowi tytuł naukowy

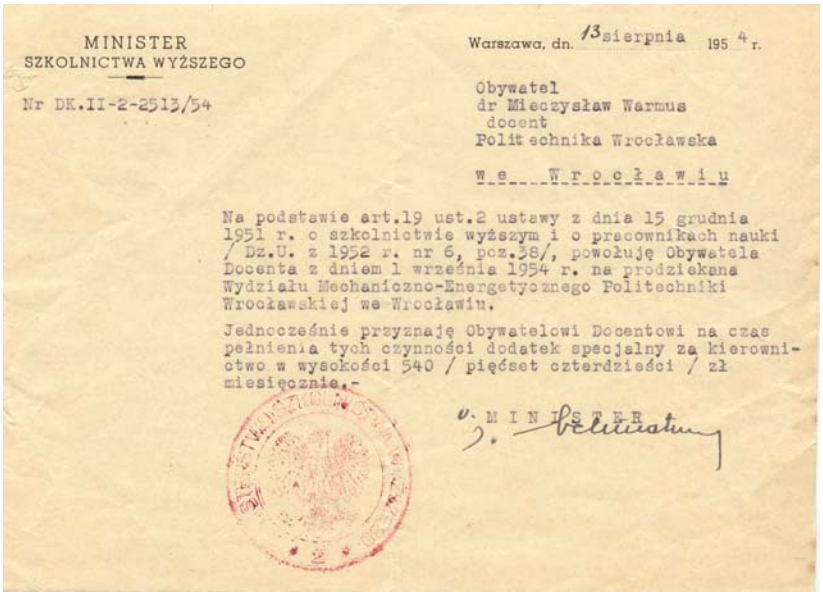
D O C E N T A

Przewodniczący
Centralnej Komisji Kwalifikacyjnej
dla Pracowników Nauki

/ A. Rapacki /

Document 12. Copy of the award document

The below reproduced letter from the Minister of Higher Education appointed *docent* Warmus to the position of Vice-Dean of the Faculty of Power and Mechanical Engineering of the Wrocław Polytechnic, commencing on the 1st of September 1954.



MINISTER
SZKOLNICTWA WYŻSZEGO

Nr DK.II-2-2513/54

Warszawa, dn. 13 sierpnia 1954 r.

Obywatel
dr Mieczysław Warmus
docent
Politechnika Wrocławska

we Wrocławiu

Na podstawie art.19 ust.2 ustawy z dnia 15 grudnia 1951 r. o szkolnictwie wyższym i o pracownikach nauki / Dz.U. z 1952 r. nr 6, poz.38/, powołuję Obywatela Docenta z dniem 1 września 1954 r. na prodziekana Wydziału Mechaniczno-Energetycznego Politechniki Wrocławskiej we Wrocławiu.

Jednocześnie przyznaję Obywatelowi Docentowi na czas pełnienia tych czynności dodatek specjalny za kierownictwo w wysokości 540 / pięćset czterdzieści / zł miesięcznie.-

v. MINISTER

Document 13. Letter of appointment

Another letter dated 5th August 1955 appointed *docent* Warmus to the position of Vice-Dean of the Electrical Engineering Faculty of the Wrocław Polytechnic.

MINISTER
SZKOLNICTWA WYŻSZEGO

Nr Z.T.VI-4-847/55

Warszawa, dn. 5 sierpnia 1955 r.

Obywatel
dr Mieczysław WARMUS
docent
Politechnika Wrocławska

we Wrocławiu

Na podstawie art.19 ust. 2 ustawy z dnia 15 grudnia 1951 r. o szkolnictwie wyższym i o pracownikach nauki /Dz.U.z 1952 r. nr 6, poz.38/, powołuję Obywatela Docenta z dniem 1 września 1955 r. na prodziekana Wydziału Elektrycznego Politechniki Wrocławskiej we Wrocławiu.

W czasie pełnienia tych czynności przysługiwać będzie Obywatelowi Docentowi dodatek za kierownictwo w wysokości i na zasadach ustalonych rozporządzeniem Rady Ministrów z dnia 28-go sierpnia 1954 r. /Dz.U.Nr 42, poz.187/.-

W związku z powyższym [illegible] Obywatela Docenta z dniem 31 sierpnia 1955 r. z funkcji prodziekana Wydziału Mechaniczno-Energetycznego [illegible] decyzją z dnia 13 sierpnia 1954 r.Nr DK.II-2-2513/54.

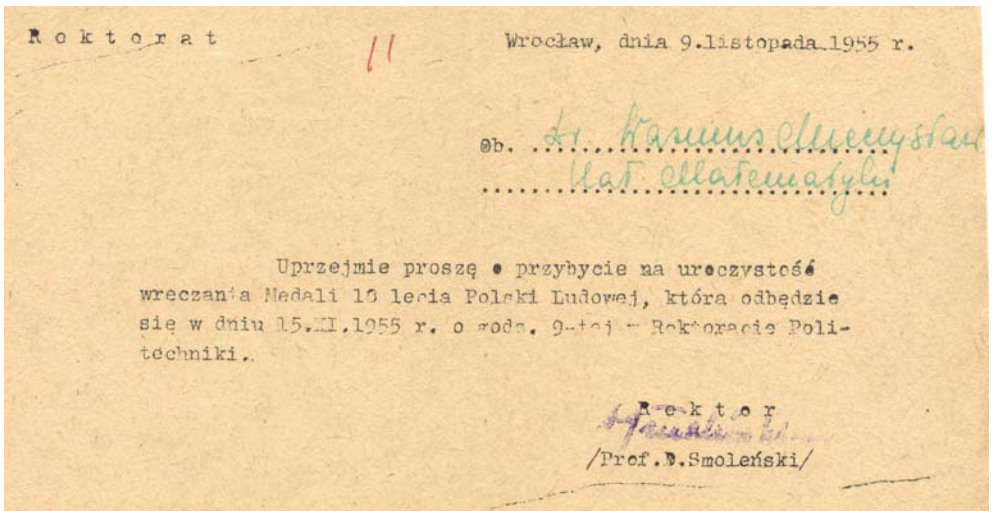
MINISTER

Document 14. Letter of appointment

The third child of Helena and Mieczysław Warmus was born on the 6th of May 1955. He was long awaited son, Tomasz.

20. The Warmus children From left: Teresa, Tomasz, and Bożena
Wrocław, 1956

In November 1955 the Council of the State awarded *docent* Warmus the Polish Peoples' State Medal (10th Anniversary) for his academic achievements.



Rektorat

11

Wrocław, dnia 9.listopada 1955 r.

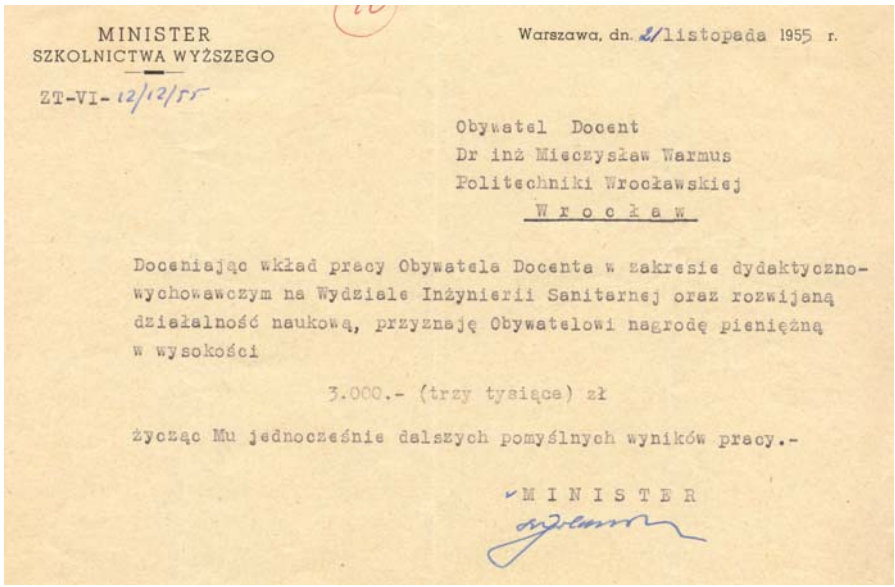
Ob. dr. Kazimierz Mieczysław
Mat. Matematyki

Uprzejmie proszę o przybycie na uroczystość wręczania Medali 10 lecia Polski Ludowej, która odbędzie się w dniu 15.XI.1955 r. o godz. 9-tej w Rektoracie Politechniki.

Rektor
/Prof. B. Smoleński/

Document 15. Invitation to the medal ceremony

In the same month, *docent* Warmus received a financial prize awarded by the Minister for Higher Education.



MINISTER
SZKOLNICTWA WYŻSZEGO

ZT-VI- 12/12/55

Warszawa, dn. 2/listopada 1955 r.

Obywatel Docent
Dr inż Mieczysław Warmus
Politechniki Wrocławskiej
W r o c ł a w

Doceniając wkład pracy Obywatela Docenta w zakresie dydaktyczno-wychowawczym na Wydziale Inżynierii Sanitarnej oraz rozwijaną działalność naukową, przyznaję Obywatelowi nagrodę pieniężną w wysokości

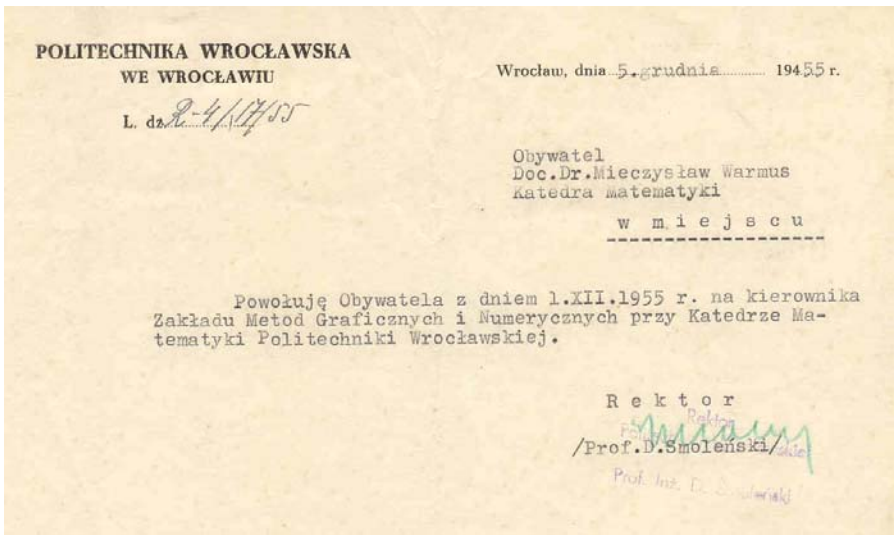
3.000.- (trzy tysiące) zł

życząc Mu jednocześnie dalszych pomyślnych wyników pracy.-

MINISTER

Document 16. Letter from the Minister

Soon after that, in a letter dated 5th December 1955, the Chancellor of the Wrocław Polytechnic appointed *docent* Warmus to lead the Graphical and Numerical Methods Section at the Faculty of Mathematics. As a part of his duties, he supervised the research work of eight junior academics.



POLITECHNIKA WROCŁAWSKA
WE WROCŁAWIU

L. dz. 2-4/XII/55

Wrocław, dnia 5. grudnia 1955 r.

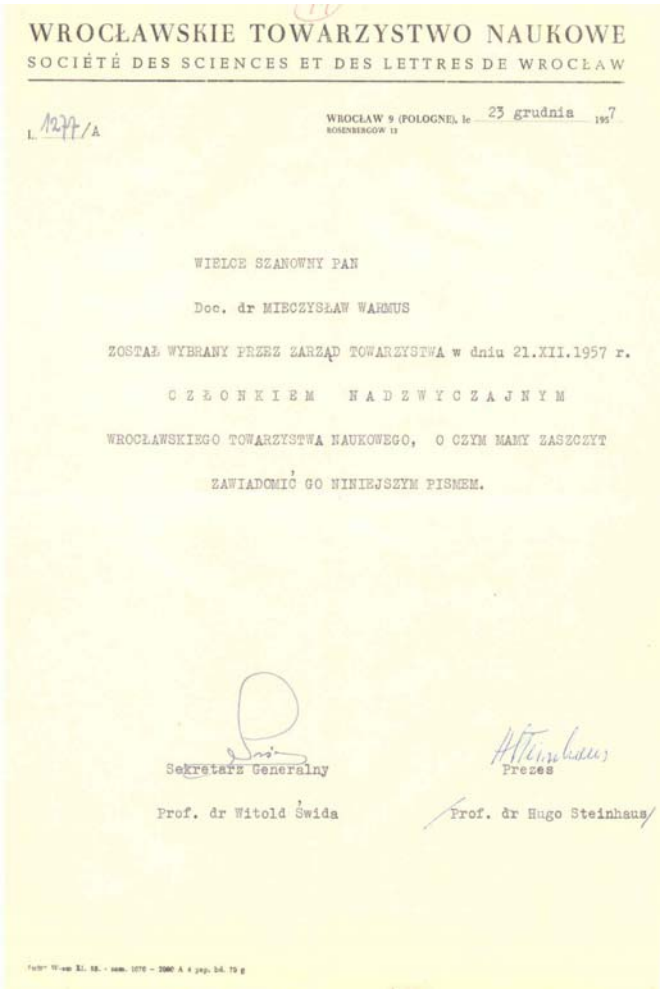
Obywatel
Doc.Dr.Mieczysław Warmus
Katedra Matematyki
w m i e j s c u

Powołuję Obywatela z dniem 1.XII.1955 r. na kierownika Zakładu Metod Graficznych i Numerycznych przy Katedrze Matematyki Politechniki Wrocławskiej.

R e k t o r
/Prof.D.Smoleński/

Document 17. Letter from the Chancellor

In 1956, *docent* Warmus received the Special Award of the Institute of Mathematics of the Polish Academy of Sciences. In October of 1957, the Council of the State awarded him Golden Cross of Merit. In the same year the Chancellor of the Wrocław Polytechnic awarded *docent* Warmus a special recognition award and the Polish Mathematical Society selected him for the year 1957 award (Mazurkiewicz Award).
The year 1957 was also productive in *docent* Warmus's social and religious work. Taking the opportunity of temporarily increased religious tolerance after the 1956 political upheavals and changes, *docent* Warmus became one of the founders of the Catholic Intelligentsia Club in Wrocław. This certainly became one more "blot" in his *dossier* kept by the Polish Security Police.
On the 23rd of December 1957, Mieczysław Warmus was appointed as an Associate Member of the Wrocław Scientific Society.



WROCŁAWSKIE TOWARZYSTWO NAUKOWE
SOCIÉTÉ DES SCIENCES ET DES LETTRES DE WROCŁAW

L. 1277/A

WROCŁAW 9 (POLOGNE), le 23 grudnia 1957
ROSENBERGOW 13

WIELCE SZANOWNY PAN

Doc. dr MIECZYSŁAW WARMUS

ZOSTAŁ WYBRANY PRZEZ ZARZĄD TOWARZYSTWA w dniu 21.XII.1957 r.

C Z Ł O N K I E M N A D Z W Y C Z A J N Y M

WROCŁAWSKIEGO TOWARZYSTWA NAUKOWEGO, O CZYM MAMY ZASZCZYT

ZAWIADOMIĆ GO NINIEJSZYM PISMEM.

Sekretarz Generalny
Prof. dr Witold Świda

Prezes
Prof. dr Hugo Steinhaus

Document 18. Letter of appointment from the Society

Holding important positions in the academic hierarchy and professional bodies did not prevent *docent* Warmus from continuing his scientific research. Between 1950 and 1958, *docent* Warmus published, or submitted for publication, fifteen research papers and one monograph [items 8-22, 23].
Docent Warmus also intensified his research for the professorial dissertation (praca habilitacyjna) entitled *Funkcje nomogramowalne (Nomographic Functions)* [item 22], which was ready for submission in 1957.

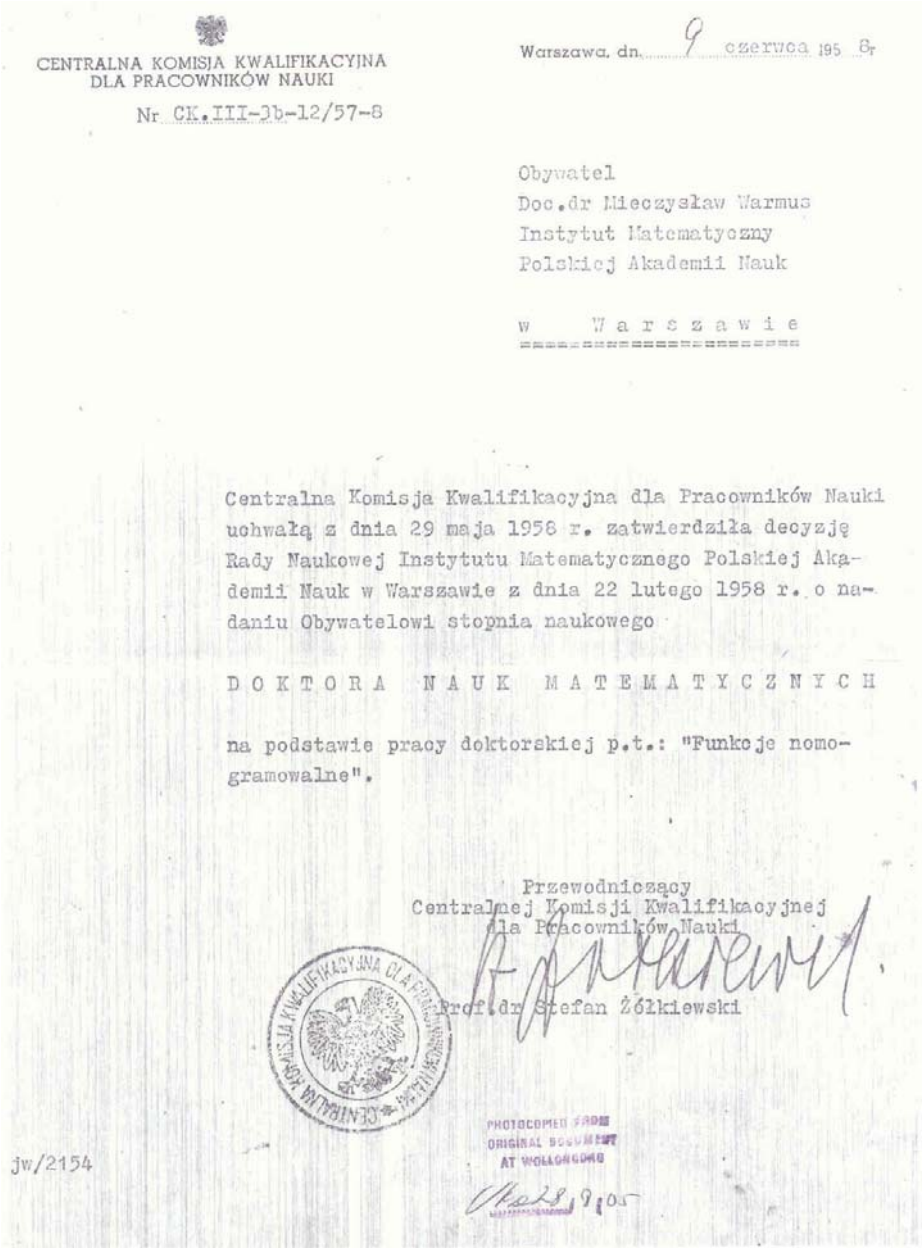
The 12th Session of the Scientific Council of the Institute of Mathematics of the Polish Academy of Sciences, held on the 26th of October 1957, determined that the dissertation met the required standards and criteria. The date for the public discussion of the dissertation was set for the month of January of 1958. Professor Stefan Straszewicz from the Warsaw Polytechnic and Professor Władysław Ślebodziński from the Wrocław Polytechnic were appointed referees.
Professor Władysław Ślebodziński, in his paper of the 23rd of October 1957 about the professorial dissertation (praca habilitacyjna) *Funkcje nomogramowalne (Nomographic Functions), wrote:*

…" After a careful analysis of docent Warmus's dissertation and a direct comparison with other work on the subject I can ascertain that it is an autonomous and creative contribution to science. Moreover, ***it is the first complete solution to an interesting theoretical problem of great importance for practical applications… …it also must be mentioned that docent Warmus is the first and, so far, the only Polish mathematician for whom the problems of applied mathematics are the main focus of interest and research work and who achieved many valuable and important results in that area."***

The 15th Session of the Scientific Council of the Institute of Mathematics of the Polish Academy of Sciences, which took place on the 22nd of February 1958, saw the public discussion of docent Warmus's professorial dissertation. The Scientific Council duly awarded docent Warmus with the title of ***Doktor Nauk Matematycznych***.
That decision of the Council was than endorsed by the State Central Commission on Academic Professional Qualifications, on the 29th of May 1958.
That recognition was the best reward for *docent* Warmus's entire academic and research endeavour.
The following statement is attached to his professorial dissertation (praca habilitacyjna) file:
...Apart from the above-mentioned dissertation, docent Warmus's research work comprises twenty published research papers and two recently accepted for publication. All these papers were produced in the last ten years The fact that they appeared in important and serious scientific publications, with extremely rigorous selection processes and high professional and scientific expectations of their

authors, is an important testimony to the high academic standard of docent Warmus's research work and his lively scientific interests.

Most of the papers deal with numerical and graphical methods, relatively unknown in Polish mathematics and docent Warmus is the only Polish mathematician specialising in this field.



CENTRALNA KOMISJA KWALIFIKACYJNA
DLA PRACOWNIKÓW NAUKI

Nr CK.III-Ob-12/57-8

Warszawa, dn. 9 czerwca 195 8r

Obywatel
Doc.dr Mieczysław Warmus
Instytut Matematyczny
Polskiej Akademii Nauk

w Warszawie

Centralna Komisja Kwalifikacyjna dla Pracowników Nauki uchwałą z dnia 29 maja 1958 r. zatwierdziła decyzję Rady Naukowej Instytutu Matematycznego Polskiej Akademii Nauk w Warszawie z dnia 22 lutego 1958 r. o nadaniu Obywatelowi stopnia naukowego

D O K T O R A N A U K M A T E M A T Y C Z N Y C H

na podstawie pracy doktorskiej p.t.: "Funkcje nomogramowalne".

Przewodniczący
Centralnej Komisji Kwalifikacyjnej
dla Pracowników Nauki
Prof.dr Stefan Żółkiewski

CENTRALNA KOMISJA KWALIFIKACYJNA DLA PRACOWNIKÓW NAUKI

PHOTOCOPIED FROM ORIGINAL DOCUMENT AT WOLLONGONG

jw/2154

Document 19. Mieczysław Warmus's appointment

According to doc. Warmus himself, his most important work of that period included:

1. *Metody numeryczne i graficzne (Graphical and numerical methods)* [item 23], a book written in collaboration with Józef Łukaszewicz. This monograph owed its existence to the initiative of docent Warmus. The chapters dealing with graphical methods were written by Józef Łukaszewicz and docent Warmus penned the bigger part of the book, which dealt with the numerical methods. Chapter one, on the theory of maximal error, was written in collaboration. The inclusion of the book in the **Biblioteka Matematyczna (Mathematics Library)** XII, PWN Warszawa 1956, was an acknowledgement of the book's importance.
2. *Nomographic functions* [item 22], accepted for publication in **Rozprawy Matematyczne (Mathematics Papers)** and simultaneously presented as professorial dissertation (praca habilitacyjna).
3. *Calculus of Approximations* [item 20] – synopsis of this work was published in the **Bulletin de l'Academie Polonaise des Sciences**. C1.III.Vol IV No 5, 1956, pp. 253-259; it became the basis for a monograph, which was then being prepared for publication by its author.

(Excerpt from "Account of research work" by docent Warmus, Wrocław, 7th of January 1958)

Since the very beginning of his research work, Mieczysław Warmus was convinced that mathematics should play an important role in practical service to humanity. Consequently, he felt that mathematics should be utilized in all sciences and be accessible to all scientists, irrespective of their diverse fields of professional interests.
His treatment of mathematics as the queen and the servant of all science resembled the attitude of the already mentioned Bell Eric Temple. Such approach explains why he chose to focus his interest on applied mathematics. As the documents quoted here revealed, this area of mathematics was almost unknown in post-war Poland.

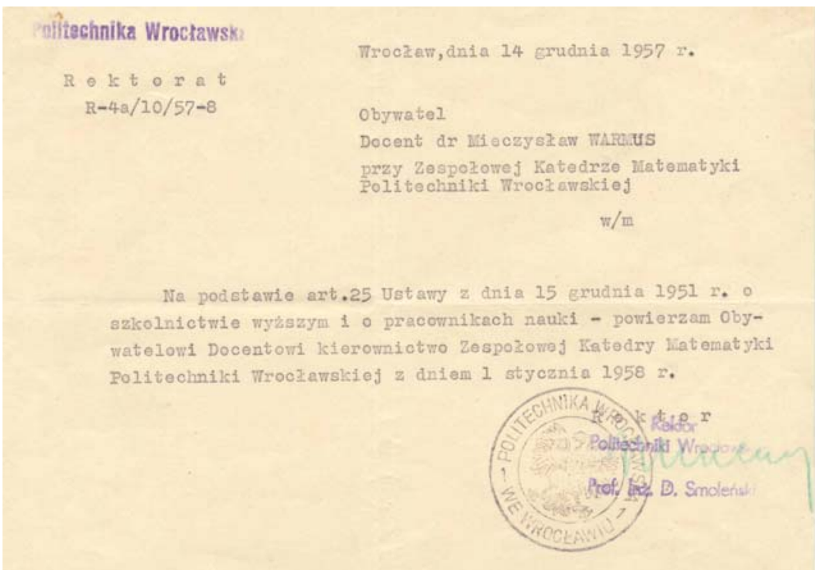
The practical approach to all manner of problems, demonstrated by Mieczysław Warmus, arose form the hardships of his early life and great personal discipline. Efficient use of his working time was crucial in providing adequately for his family since his early youth.

It was thanks to his research interests and work that mathematical methods found their way into other areas of science in Poland. His work and research results, such as tables of functions, were found to be very useful before the introduction of computers and calculators. These tables were used by many engineers, statisticians, astronomers and students (not only of mathematics).
Mieczysław Warmus formed a view that the most logical way of effective application of mathematical computing in various areas of the industry, national economy, medicine and natural sciences would involve the creation of a

computation centre housing computing machines. He was convinced that the power of the machines could be harnessed to speed up difficult mathematical operations. In that way the human potential would be utilized more economically and productively, which would contribute considerably to the success of Poland's national economy.

At every opportunity, at meetings, academic conferences and seminars, docent Warmus strongly advocated for the acquisition and utilisation of digital computing machines in Poland. It often invited objections from the older academics at the Institute of Mathematics PAN in Warsaw, who were practicing classical, theoretical mathematics and were rather conservative in their views, but were very influential in economic decision-making processes. They were determined to oppose the acquisition of computing machines, maintaining that it was unnecessary, as the Laboratory for Mathematical Apparatus of PAN was in the process of developing a Polish own computer (That laboratory later changed its name to the Institute of Mathematical Machines). Docent Warmus's courageous and visionary initiatives were not helping the advancement of his own career. Nevertheless, he continued persistently to pursue his ambitious aims and to fulfil his vision.

On the 1st of January 1958, docent Warmus became Head of the Integrated School of Mathematics at the Wrocław Polytechnic.



Politechnika Wrocławska

Rektorat
R-4a/10/57-8

Wrocław, dnia 14 grudnia 1957 r.

Obywatel
Docent dr Mieczysław WARMUS
przy Zespołowej Katedrze Matematyki
Politechniki Wrocławskiej

w/m

Na podstawie art.25 Ustawy z dnia 15 grudnia 1951 r. o szkolnictwie wyższym i o pracownikach nauki - powierzam Obywatelowi Docentowi kierownictwo Zespołowej Katedry Matematyki Politechniki Wrocławskiej z dniem 1 stycznia 1958 r.

Rektor
Rektor
Politechniki Wrocławskiej
Prof. Inż. D. Smoleński

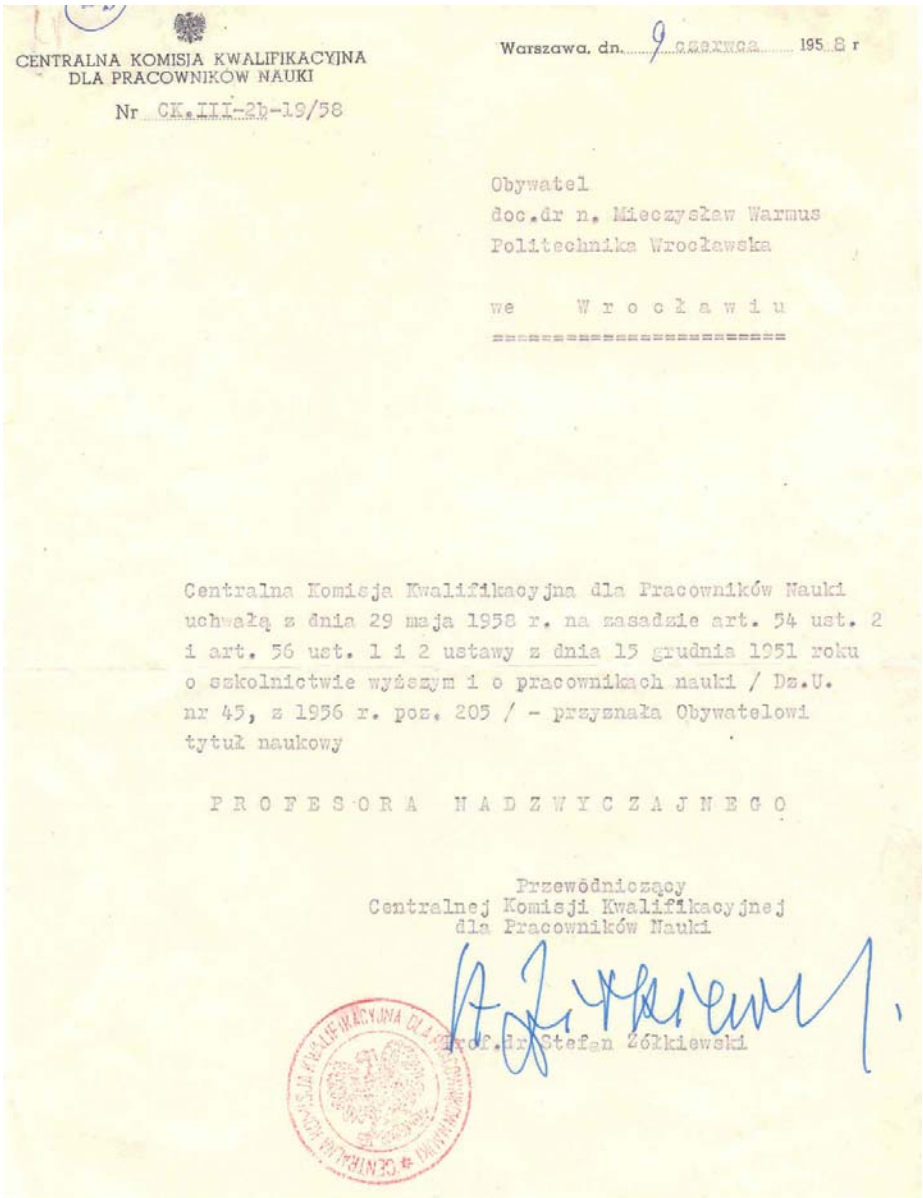
POLITECHNIKA WROCŁAWSKA WE WROCŁAWIU

Document 20. Letter of Appointment

On the 7th of January 1958, in his submission papers, required yearly when applying for an Independent Researcher position, docent Warmus wrote:
"...I am planning for a mathematical laboratory where students could practice working on computers. In the current academic year, only 2nd year students of the Electrical Faculty will be allowed to practice. Further expansion will depend on accumulated experience.

I am also organizing a computation centre in Wrocław, which would have a twofold aim of contributing to academic research in the area of methods centred around mathematical analysis on the one hand, and providing services in industrial applications on the other…"

The National Committee for Academic Appointments and Promotions in its decree of the 29th of May 1958 awarded docent Warmus the title of the Associate Professor (Profesor Nadzwyczajny).



CENTRALNA KOMISJA KWALIFIKACYJNA
DLA PRACOWNIKÓW NAUKI

Nr CK.III-2b-19/58

Warszawa, dn. 9 czerwca 195 8 r

Obywatel
doc.dr n. Mieczysław Warmus
Politechnika Wrocławska

we W r o c ł a w i u

Centralna Komisja Kwalifikacyjna dla Pracowników Nauki uchwałą z dnia 29 maja 1958 r. na zasadzie art. 54 ust. 2 i art. 56 ust. 1 i 2 ustawy z dnia 15 grudnia 1951 roku o szkolnictwie wyższym i o pracownikach nauki / Dz.U. nr 45, z 1956 r. poz. 205 / - przyznała Obywatelowi tytuł naukowy

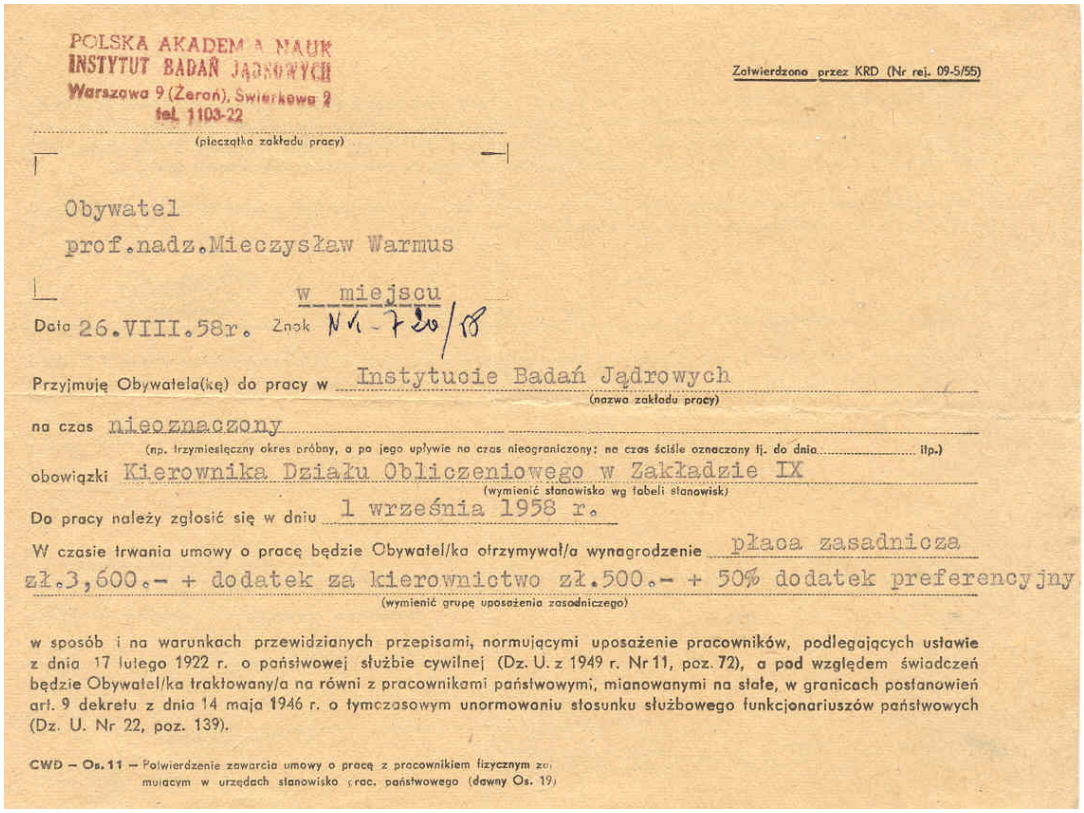
P R O F E S O R A N A D Z W Y C Z A J N E G O

Przewodniczący
Centralnej Komisji Kwalifikacyjnej
dla Pracowników Nauki

prof.dr Stefan Zółkiewski

Document 21. Letter of Appointment

In another letter from the Nuclear Research Institute of the Polish Academy of Sciences, dated 26th August 1958, Professor Mieczysław Warmus was appointed Head of the Computation Section at the Department IX, commencing on the 1st of September 1958.



POLSKA AKADEMIA NAUK
INSTYTUT BADAŃ JĄDROWYCH
Warszawa 9 (Żerań), Świerkowa 2
tel. 1103-22
(pieczątka zakładu pracy)

Zatwierdzono przez KRD (Nr rej. 09-5/55)

Obywatel
prof.nadz.Mieczysław Warmus

w miejscu

Data 26.VIII.58r. Znak NK-720/58

Przyjmuję Obywatela(kę) do pracy w Instytucie Badań Jądrowych
(nazwa zakładu pracy)

na czas nieoznaczony
(np. trzymiesięczny okres próbny, a po jego upływie na czas nieograniczony; na czas ściśle oznaczony tj. do dnia ..... itp.)

obowiązki Kierownika Działu Obliczeniowego w Zakładzie IX
(wymienić stanowisko wg tabeli stanowisk)

Do pracy należy zgłosić się w dniu 1 września 1958 r.

W czasie trwania umowy o pracę będzie Obywatel/ka otrzymywał/a wynagrodzenie płaca zasadnicza zł.3,600.- + dodatek za kierownictwo zł.500.- + 50% dodatek preferencyjny
(wymienić grupę uposażenia zasadniczego)

w sposób i na warunkach przewidzianych przepisami, normującymi uposażenie pracowników, podlegających ustawie z dnia 17 lutego 1922 r. o państwowej służbie cywilnej (Dz. U. z 1949 r. Nr 11, poz. 72), a pod względem świadczeń będzie Obywatel/ka traktowany/a na równi z pracownikami państwowymi, mianowanymi na stałe, w granicach postanowień art. 9 dekretu z dnia 14 maja 1946 r. o tymczasowym unormowaniu stosunku służbowego funkcjonariuszów państwowych (Dz. U. Nr 22, poz. 139).

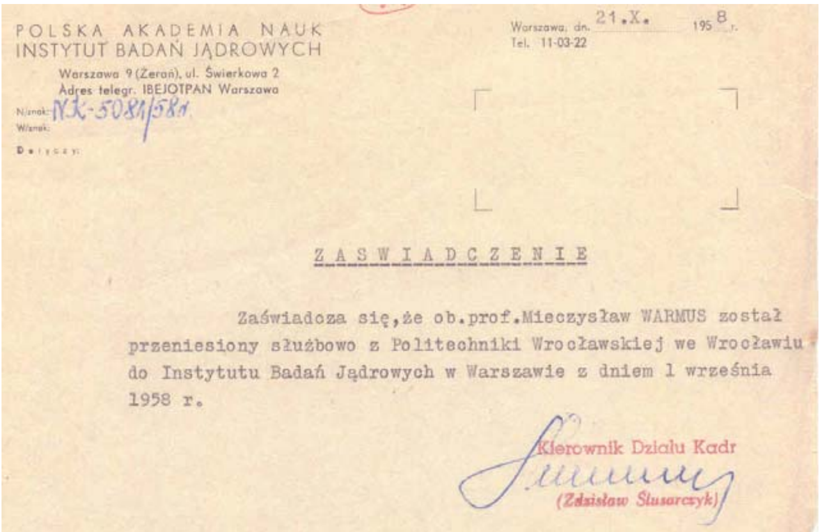
CWD – Os.11 – Potwierdzenie zawarcia umowy o pracę z pracownikiem fizycznym zatrudniającym w urzędach stanowisko prac. państwowego (dawny Os. 19)

Document 22. Letter of Appointment

The later appointment necessitated academic transfer from the Wrocław Polytechnic to the Nuclear Research Institute (IBJ) in Warsaw. It happened just three months after Professor Warmus's elevation to the position of Associate Professor and marked the beginning of a new chapter in the life of the Professor and his family.

Mathematics or politics?
Warsaw 1958 - 1968

For Professor Warmus, his academic transfer from the Wrocław Polytechnic to take up the position of Head of the Computation Section in the 9th Department of the Nuclear Research Institute PAN in Warsaw opened entirely new horizons.



POLSKA AKADEMIA NAUK
INSTYTUT BADAŃ JĄDROWYCH
Warszawa 9 (Żerań), ul. Świerkowa 2
Adres telegr. IBEJOTPAN Warszawa
Nr znak: NK-5081/58

Warszawa, dn. 21.X. 1958 r.
Tel. 11-03-22

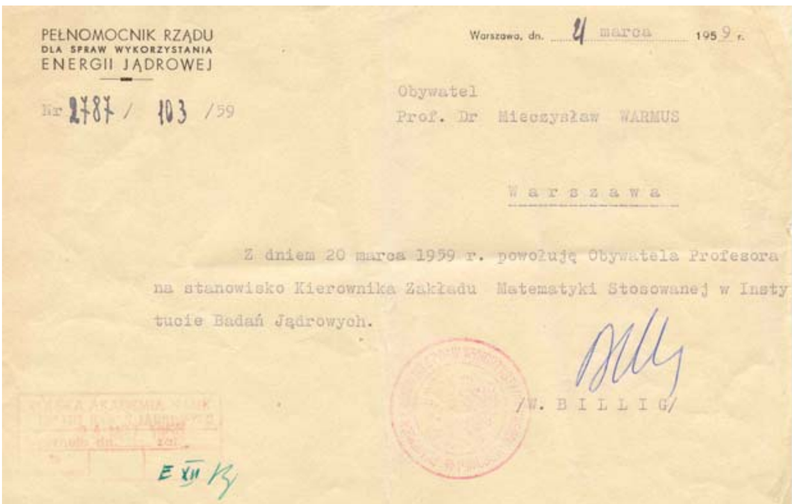
ZAŚWIADCZENIE

Zaświadcza się, że ob.prof.Mieczysław WARMUS został przeniesiony służbowo z Politechniki Wrocławskiej we Wrocławiu do Instytutu Badań Jądrowych w Warszawie z dniem 1 września 1958 r.

Kierownik Działu Kadr
(Zdzisław Ślusarczyk)

Document 23. Academic transfer from Wrocław

As early as March 1959, and not quite seven months after Mieczysław Warmus took up his new position at the Institute, Special Minister of State for Nuclear Energy appointed Professor Warmus to the position of Head of the newly created Department of Applied Mathematics at the Institute (IBJ PAN).



PEŁNOMOCNIK RZĄDU
DLA SPRAW WYKORZYSTANIA
ENERGII JĄDROWEJ

Nr 1787 / 103 /59

Warszawa, dn. 4 marca 1959 r.

Obywatel
Prof. Dr Mieczysław WARMUS

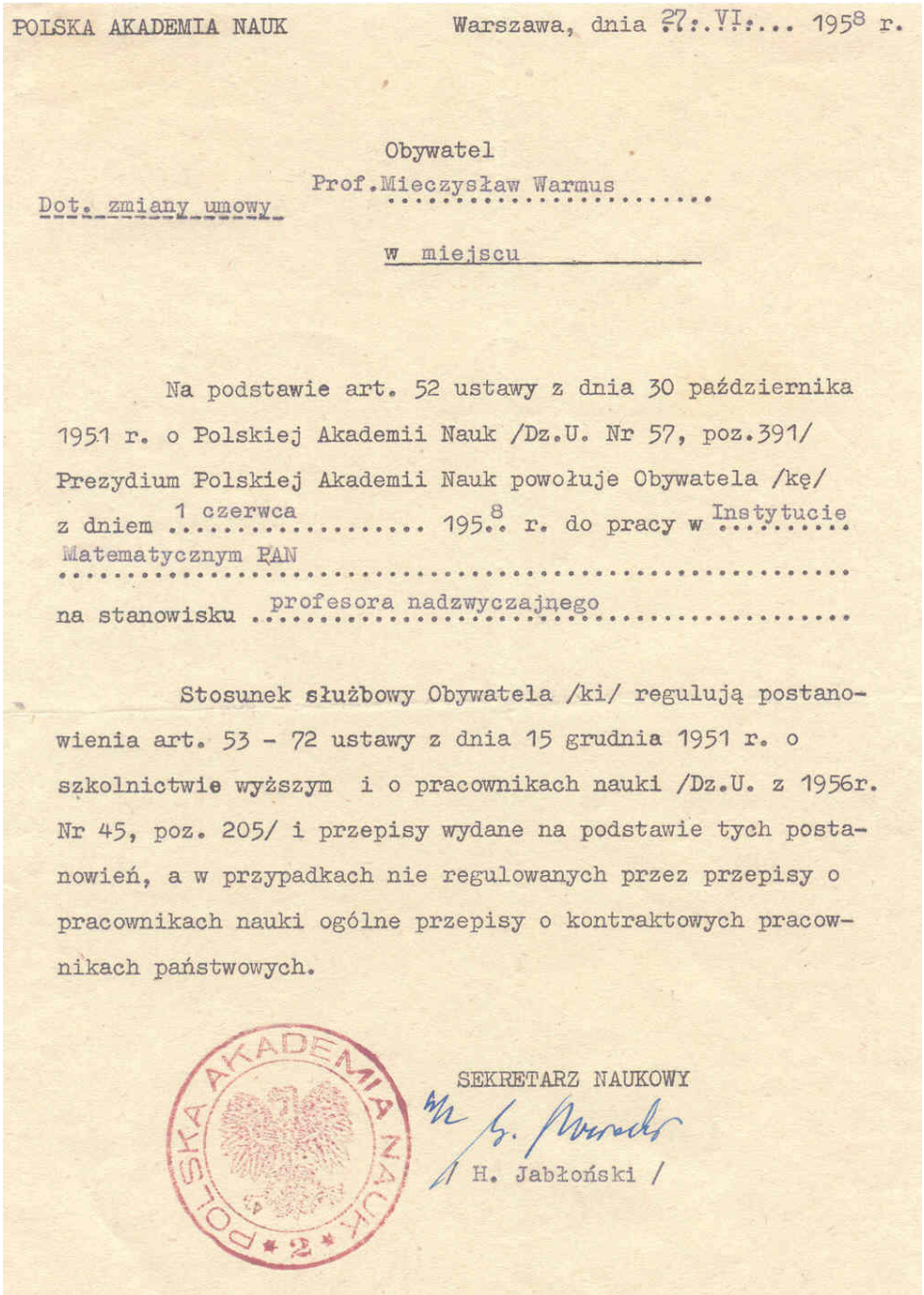
Warszawa

Z dniem 20 marca 1959 r. powołuję Obywatela Profesora na stanowisko Kierownika Zakładu Matematyki Stosowanej w Instytucie Badań Jądrowych.

/W. BILLIG/

Document 24. Letter of appointment, Head of Department

The Department was created from the existing Computation Section and was a new entity in the structure of the Polish Academy of Science. Mieczysław Warmus continued to be formally employed as an academic by the Institute of Mathematics of PAN but from the 1st of June 1958 he held the position of an Associate Professor, which was one rung higher in the academic hierarchy.



POLSKA AKADEMIA NAUK

Warszawa, dnia 27.VI.... 1958 r.

Obywatel
Prof. Mieczysław Warmus

Dot. zmiany umowy

w miejscu

Na podstawie art. 52 ustawy z dnia 30 października 1951 r. o Polskiej Akademii Nauk /Dz.U. Nr 57, poz.391/ Prezydium Polskiej Akademii Nauk powołuje Obywatela /kę/ z dniem 1 czerwca 1958 r. do pracy w Instytucie Matematycznym PAN na stanowisku profesora nadzwyczajnego

Stosunek służbowy Obywatela /ki/ regulują postanowienia art. 53 - 72 ustawy z dnia 15 grudnia 1951 r. o szkolnictwie wyższym i o pracownikach nauki /Dz.U. z 1956r. Nr 45, poz. 205/ i przepisy wydane na podstawie tych postanowień, a w przypadkach nie regulowanych przez przepisy o pracownikach nauki ogólne przepisy o kontraktowych pracownikach państwowych.

POLSKA AKADEMIA NAUK * 2 *

SEKRETARZ NAUKOWY
/ H. Jabłoński /

Document 25. Letter of appointment, Associate Professorship

The end of 1958 was a watershed period for the whole Warmus family. Professor Warmus's transfer from Wrocław to the capital Warsaw brought about significant changes in the lives of all members of his immediate family. The whole logistical aspect of the move of the family of eight, and all the associated problems, became the sole responsibility of Mrs. Helena Warmus.
Mieczysław's father, then 76, retired after twelve years in the Trades Hall. Professor's mother was also advanced in age and the whole family had to look after his younger sister who was disabled and required constant care. In that period of time two older daughters of Mieczysław and Helena, eleven year old Teresa and eight year old Bożena, attended primary school. Their son Tom (Tomek), then three, remained at home in the care of his mother. Helena, enterprising by nature and used to taking care of all family business, managed the move well and by October 1958 the Warmus family was already settled in Warsaw. Their life was slowly taking some semblance of normality.
Professor Warmus's new managerial position in the Institute of the Polish Academy of Science opened new possibilities of close contacts with people responsible for future directions in the development of Polish science as well as with those who were directly responsible for the economy of the country. It also presented him with frequent opportunities to put forward his scientific views and his vision of practical applications of mathematics for the benefit of the national economy.
Professor Warmus never missed an opportunity to emphasize the growing importance of digital computing machines in the developed world. At the same time, he used to emphasise that, in Poland, that process was seriously hampered by the lack of digital computers. He argued that that situation was due to two main causes - inability to import computing equipment on the one hand, and very slow progress in developing it locally, in Poland, on the other.

It is necessary to remember that in the end of the fifties, the construction work on computers in Poland was still in its experimental stage. The XYZ computer, designed at the Laboratory for Mathematical Apparatus of PAN and put into practical use in the autumn of 1958, was the very first such machine produced in Poland.
The second one, called UMC, designed and produced in the Faculty of Radio and Telecommunication Design at the Warsaw Polytechnic, was put to practical use in 1959.
In 1960, the Department of Applied Mathematics of the Nuclear Research Institute of PAN, with the collaboration of the Faculty of Electrical Power Systems of the Warsaw University, designed and produced another computer.
It was called Emal-2 and was the third working Polish-designed digital computer. All three computers were characterised by comparatively limited capability and were really nothing more than experimental models.

It was around those machines that the first small computation centres were created.

Those centres had to be credited with the pioneering work in the area of computer applications in Poland. The above mentioned three machines contributed significantly to the further development in the construction of Polish digital computers and played an important role in the process of training a sizable group of computer specialists, both engineers and mathematicians. The use of those pioneer computers hugely enhanced computational abilities in comparison to the work that could have been previously performed on arithmometres. Still, it was out of keeping with the pace and rapid developments in that area elsewhere in the developed world.

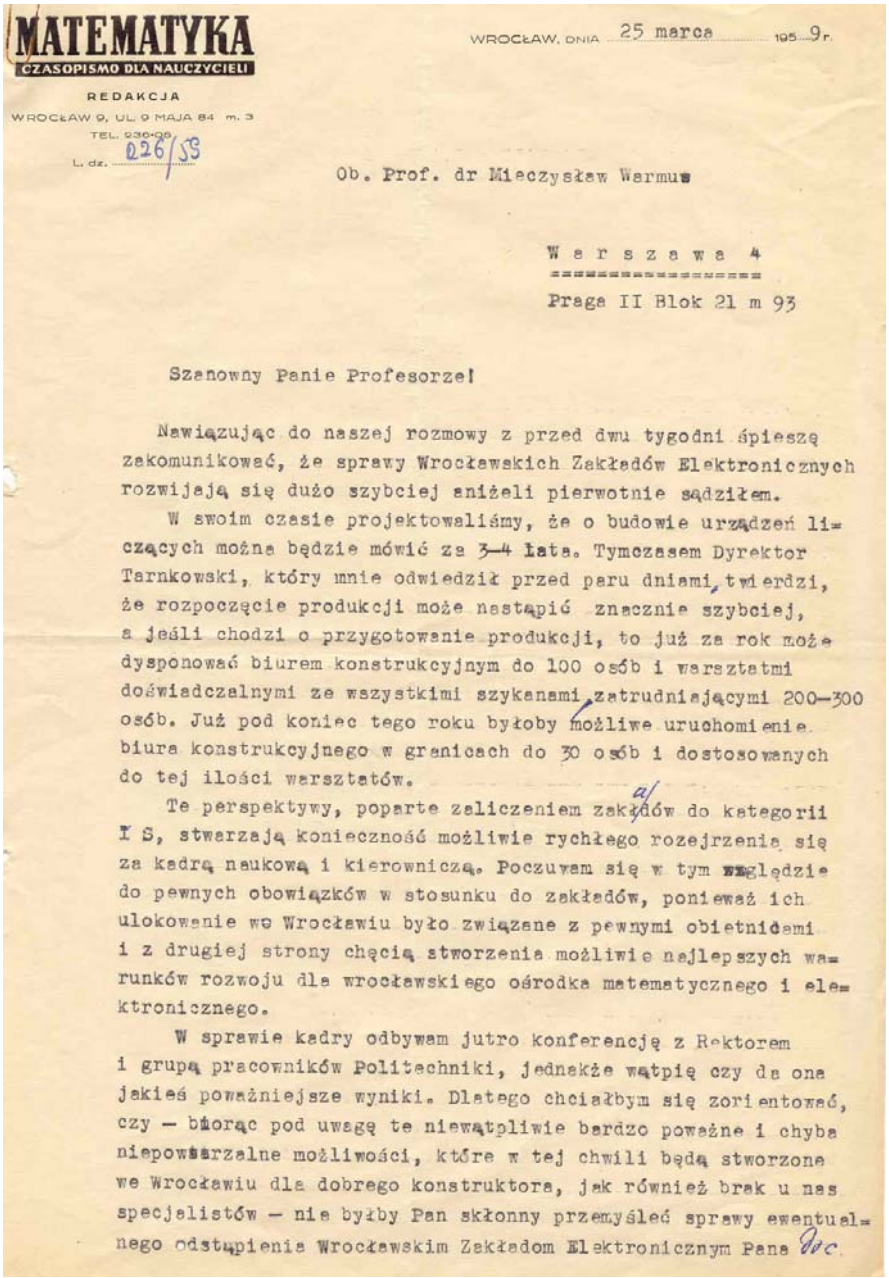
Professor Warmus argued that the only way to speed up the development of the nascent computer technology in Poland was to create a computation centre endowed with an imported electronic computing machine of high capability. Such a centre, besides servicing all the scientific entities of PAN, would also carry out scientific, educational, training, technical and information functions.

The scientific authorities of PAN viewed Professor Warmus's suggestions and proposals with a great deal of scepticism as they were ideologically committed to supporting home-grown development of computer technology and refused to acknowledge the growing technological gap separating Poland from the rest of the developed world.
In addition to his numerous administrative duties during his Headship of the Department of Applied Mathematics in the Nuclear Research Institute of PAN, Professor Warmus was also engaged in very fruitful scientific research. In that period he managed to publish the following four research papers:

1. *Floating-Point Arithmetic for Digital Computers*. **Instytut Badań Jądrowych**, Report No 187/XII, Warsaw 1960, pp.1-5[item 24];
2. *Rozwiązywanie numeryczne równań trzeciego i czwartego stopnia o współczynnikach rzeczywistych.* (Solving numerical equations of the 3rd and 4th order with determinants). **Zastosowania Matematyki VI,** Warszawa 1961, pp. 127-135[item 25];
3. *Transformed Point Arithmetic for Digital Computers*. **Bulletin de l'Academie Polonaise des Sciences.** Serie des sciences math., astr. et phys. Vol. IX, No 4, 1961, pp. 237-239 [Item 26];
4. *Approximation and Inequalities in the Calculus of Approximations. Classification of Approximate Numbers.* **Bulletin de l'Academie Polonaise des Sciences.** Serie des sciences math., astr. et phys. Vol. IX, No 4, 1961, pp. 241-245 [item 27].

Apart from the administrative duties and engagement in research, Professor Warmus was also involved in academic supervision of his doctoral students.
He continued to maintain close contact with the entire academic milieu in Wrocław and was very closely associated with the development and organization and construction of a new research centre in the Wrocław Electronic Enterprises

ELWRO. He was also active in the training centre at the Polytechnic, which he had initiated some time before. Professor Bolesław Iwaszkiewicz (1900 - 1981), the Chairman of the Wrocław City Council (in the years 1957-1969) and a fellow mathematician, in his letter (dated 25th of March 1959), addressed to Professor Warmus, sought his opinion in relation to the planned centres and solicited his assistance in securing appropriate academic and administrative staff.



MATEMATYKA
CZASOPISMO DLA NAUCZYCIELI
REDAKCJA
WROCŁAW 9, UL. 9 MAJA 84 m. 3
TEL. 230-06
L. dz. 026/58

WROCŁAW, DNIA 25 marca 195 9 r.

Ob. Prof. dr Mieczysław Warmus

W a r s z a w a 4
Praga II Blok 21 m 93

Szanowny Panie Profesorze!

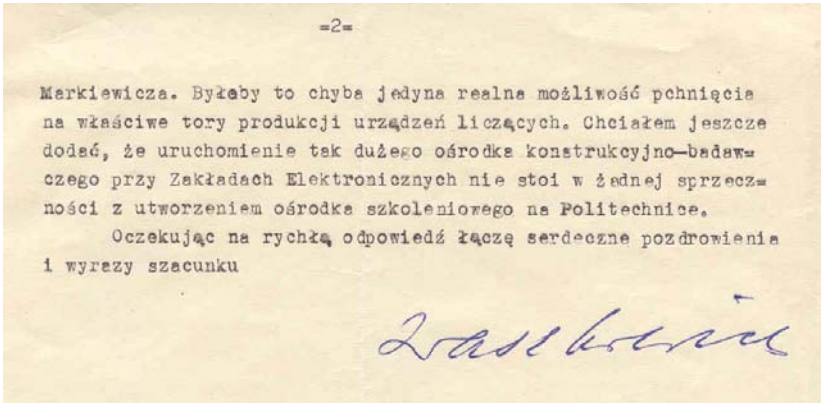
Nawiązując do naszej rozmowy z przed dwu tygodni śpieszę zakomunikować, że sprawy Wrocławskich Zakładów Elektronicznych rozwijają się dużo szybciej aniżeli pierwotnie sądziłem.

W swoim czasie projektowaliśmy, że o budowie urządzeń liczących można będzie mówić za 3—4 lata. Tymczasem Dyrektor Tarnkowski, który mnie odwiedził przed paru dniami, twierdzi, że rozpoczęcie produkcji może nastąpić znacznie szybciej, a jeśli chodzi o przygotowanie produkcji, to już za rok może dysponować biurem konstrukcyjnym do 100 osób i warsztatmi doświadczalnymi ze wszystkimi szykanami, zatrudniającymi 200—300 osób. Już pod koniec tego roku byłoby możliwe uruchomienie biura konstrukcyjnego w granicach do 30 osób i dostosowanych do tej ilości warsztatów.

Te perspektywy, poparte zaliczeniem zakładów do kategorii I S, stwarzają konieczność możliwie rychłego rozejrzenia się za kadrą naukową i kierowniczą. Poczuwam się w tym względzie do pewnych obowiązków w stosunku do zakładów, ponieważ ich ulokowanie we Wrocławiu było związane z pewnymi obietnicami i z drugiej strony chęcią stworzenia możliwie najlepszych warunków rozwoju dla wrocławskiego ośrodka matematycznego i elektronicznego.

W sprawie kadry odbywam jutro konferencję z Rektorem i grupą pracowników Politechniki, jednakże wątpię czy da ona jakieś poważniejsze wyniki. Dlatego chciałbym się zorientować, czy — biorąc pod uwagę te niewątpliwie bardzo poważne i chyba niepowtarzalne możliwości, które w tej chwili będą stworzone we Wrocławiu dla dobrego konstruktora, jak również brak u nas specjalistów — nie byłby Pan skłonny przemyśleć sprawy ewentualnego odstąpienia Wrocławskim Zakładom Elektronicznym Pana Doc.

Document 26. Letter from Professor Iwaszkiewicz



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Markiewicza. Byłaby to chyba jedyna realna możliwość pchnięcia na właściwe tory produkcji urządzeń liczących. Chciałem jeszcze dodać, że uruchomienie tak dużego ośrodka konstrukcyjno-badawczego przy Zakładach Elektronicznych nie stoi w żadnej sprzeczności z utworzeniem ośrodka szkoleniowego na Politechnice.

Oczekując na rychłą odpowiedź łączę serdeczne pozdrowienia i wyrazy szacunku

Document 26 (cont.). Letter from Professor Iwaszkiewicz

This correspondence is a testimony to the recognition and authority commanded then by Professor Warmus. His reply to the above correspondence is dated 2nd of April 1959 and articulates forcefully his views on the situation of the nascent Polish computer technology:

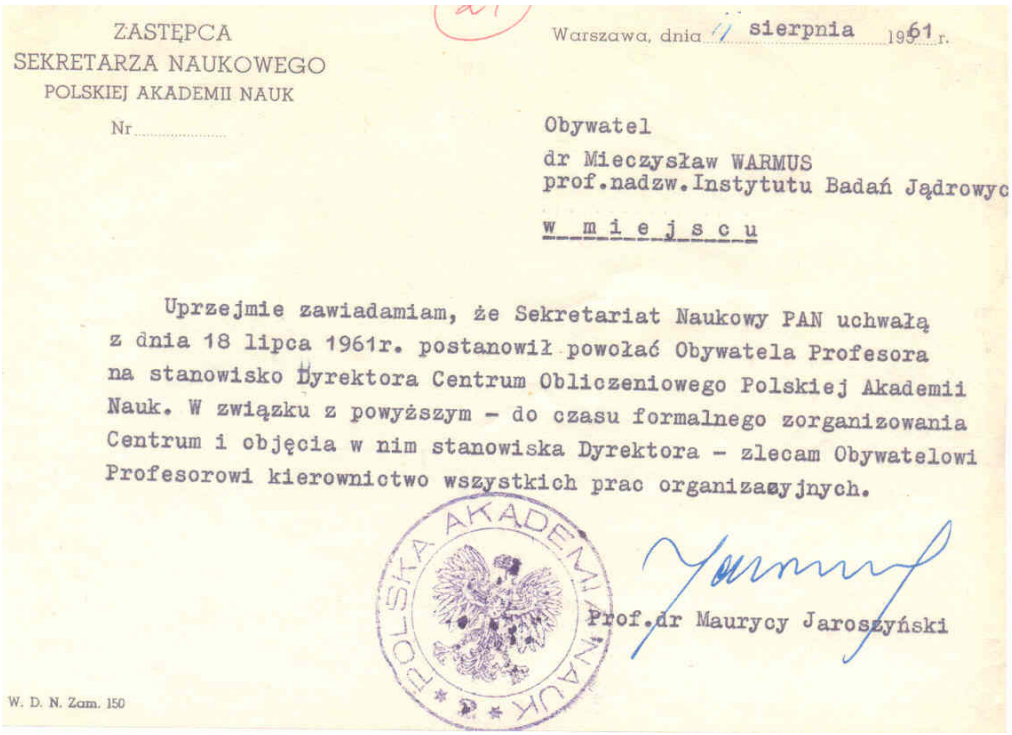
"…as Head of the Department of Applied Mathematics at the Nuclear Research Institute (IBJ) I am not interested in creating capabilities for building digital computers in IBJ. However, I am keenly interested in ensuring that the Institute has a good computer and a few technical staff to work on it. The issue of designing or building a computer in the Institute would gain an importance only if it were the only way of procuring such a computer…
…At the present moment, none of the existing digital machines is even a prototype in the manufacturing sense of the word. Thus there is a need to adapt one of the existing digital computers and create a laboratory model for the future manufacturing process. An earlier trained team could take part in the adaptation process. Subsequently such a team would return to Wrocław with working plans and design specifications of selected digital device that will become very familiar to them and initiate the manufacturing process. The training period in Warsaw would allow the Wrocław manufacturer sufficient time to organize the necessary equipment and tooling for their own workshop. For its training contribution to the project, the Nuclear Research Institute could be presented with one such reworked and adapted computer by the Wrocław manufacturer …"

It was Professor Warmus's ultimate desire to secure a modern digital computer of substantial calculation capability for the Centre. The beginning of 1961 brought with it the promise of fulfilling Professor Warmus's hopes. There were some prospects pointing to the possibility of importing such digital computers from other countries, particularly from the Soviet Union.

The leadership of the Polish Academy of Sciences (PAN) decided finally to create a new scientific and research entity under the name of Computation Centre of PAN.

On the 9th of September 1961, the Secretary of Research in PAN, and the Special Minister of State for Nuclear Energy, signed the foundation document for such Centre.
According to that document, the new Centre was to be created on the basis of the Department of Applied Mathematics, separated for that purpose from the Institute of Nuclear Research.
That document also allocated the Emal-2 digital computer to the Centre and gave an approval for the importation of an Urał-2 type computer from the Soviet Union. The latter, with much greater calculation capability then the three Polish machines, was to be financed from the funds at the disposal of the Special Minister of State for the Nuclear Energy. In return, the Computation Centre (called COPAN - Centrum Obliczeniowe Polskiej Akademii Nauk) was obliged to give priority in access to the computing services to the research entities under the umbrella of the Special Minister of State.
At the formal session of the Research Secretariat of Polish Academy of Sciences on the 18th of July 1961 Professor Mieczysław Warmus was officially installed as the first director of the newly created Centre.

The letter of appointment, signed by the Deputy Secretary of Research in the Polish Academy of Sciences, dated 11th of September 1961, requested the Professor to take charge of all preparatory and organisational arrangements related to the creation of the Centre.



ZASTĘPCA
SEKRETARZA NAUKOWEGO
POLSKIEJ AKADEMII NAUK
Nr.....

Warszawa, dnia 11 sierpnia 1961 r.

Obywatel
dr Mieczysław WARMUS
prof.nadzw.Instytutu Badań Jądrowyc

w m i e j s c u

Uprzejmie zawiadamiam, że Sekretariat Naukowy PAN uchwałą z dnia 18 lipca 1961r. postanowił powołać Obywatela Profesora na stanowisko Dyrektora Centrum Obliczeniowego Polskiej Akademii Nauk. W związku z powyższym - do czasu formalnego zorganizowania Centrum i objęcia w nim stanowiska Dyrektora - zlecam Obywatelowi Profesorowi kierownictwo wszystkich prac organizacyjnych.

POLSKA AKADEMIA NAUK

Prof.dr Maurycy Jaroszyński

W. D. N. Zam. 150

Document 27. Letter of Appointment, Director of COPAN

Ambitious and exceptionally talented researcher and scientist, Professor Warmus approached the task of realising his vision for the Centre with enthusiasm and great energy.
However, he realized that the creation of COPAN as an independent research institute of PAN was not received with equal enthusiasm by many Also his elevation to the new Director position in a very prestigious and highly specialised research institute wasn't taken kindly by some. He remembered well often-negative response of the Warsaw research establishment to his proposals concerning practical applications of computers.

It is worth remembering that in the prevailing political climate in Poland of that time it was highly unusual for a non-member of the Polish governing party to hold an important managerial position. It was owing to Professor Warmus's exceptional research qualifications and a reputation of a very effective organiser that the position was at all offered to him.

21. Professor Mieczysław Warmus in his COPAN office, on the 10th floor of the Palace of Culture and Science; Warsaw, 1961

The Computation Centre of PAN began its operations on the 1st of September 1961. Purchased in the USSR, Urał-2 digital computer had been delivered in the second half of September 1961 and became operational in January of the following year.

It was fully in service in April of 1962. Both the newly created research facility and the imported new computer attracted much public interest. It immediately became the focus of the media of the time.
Exciting headlines such as *Ural-2 operational* (**Trybuna Ludu**, 16th of February 1962) and *Face to Face with Ural-2* (**Życie Warszawy**, 4th of April 1962) became almost an everyday occurrence. The media brought the concept of digital computing out of the scientific closet and popularised it in the wider lay community.

COPAN was a research organisation focusing on solving intractable computing problems, which required highly specialised and well-trained research personnel. According to its founding principles:

…The Centre is to become the model computation centre focussed on training computer specialists for other centres, involved in providing assistance and support to other institutions in solving more difficult computing problems. It is to be responsible for creating the national centre for information technology and national scientific data bank related to the use of digital computers…

(Mieczysław Warmus: *"The Computation Centre of PAN - the new facility of the Academy"*. ***Nauka Polska*** *(Polish Science) 1963 nr 4 pp. 101-106).*

22. COPAN Director Mieczysław Warmus (right) in his office, Warsaw 1961.

The fully functional Centre was involved in a wide range of activities such as research, provision of computing services to other institutions as well as training, information and technical activities.

The research activities included creation of basic software for digital computers and application of numerical and probabilistic methods. The Centre was involved in modelling in economy, medicine and other branches of science. Apart from that, the work included further development of computer environments and research into library systems. Research results were put to practical use in the services provided by the Centre. Results of significant research value were destined for publication. COPAN cooperated widely with other national and foreign research organisations.

The service activities of the Computation Centre included numerical analyses, programming and design as well as final data analysis. In this service role, the Centre exchanged ideas and programs with other computation centres both Polish and foreign.
The training activities in the area of practical applications and operational use of digital computers encompassed both local COPAN staff, staff of other institutes and companies and tertiary students. In the context of in-house training of its own staff, the Centre conducted series of seminars, lectures as well as academic visits to other, similar centres, abroad. The training of staff from other institutions was conducted through software courses, technical aspects of servicing digital computers, in-house practical training for mathematicians, engineers and technicians and through individual consultations. Short cycles of lectures, laboratory classes and practical hands-on training sessions were also organized at the Centre for tertiary students.

The Department of Scientific Information of COPAN functioned as the national centre of expertise in the practical applications of digital computers. It also performed library function in the area of mathematical and technical literature. It exchanged know-how and publications with similar centres in Poland and abroad. The Department published scientific and research papers, documented Centre's own research and organised training.
The Department of Scientific Information of COPAN worked closely with a similar department of the Institute of Mathematical Machines of PAN, which played the role of the national information centre in the area of design and construction of digital computers.

The technical activities of COPAN included everyday maintenance of digital computers in the Centre as well as further development of its computing capabilities.

At the end of 1962, the Computation Centre employed 119 personnel including 26 academics, 65 technical and engineering staff and seven librarians managing scientific information.

The average age of the Centre personnel was 26 years, which was an extraordinary phenomenon for a research entity of PAN in those times. The reputation of the Centre as a highly specialized, well equipped research institution attracted many young and talented people. Young applicants, freshly out of university, often sought employment opportunities at the Centre.

Professor Warmus also conducted recruitment for the Centre from the most promising fourth year students of the Faculty of Mathematics, Physics and Chemistry of the University of Warsaw.
Lecturing at the Faculty enabled Professor Warmus to pick up the budding mathematical talents among the students. His ambition was to have talented young students choose such topics for their MA theses, which could be supervised by COPAN academics, with a view of their practical application.

In its first few years of existence the Centre conducted more then 300 commissioned computing jobs per year. It was envisaged however, that once other similar centres in Poland had been established, they would take over thebulk of such huge volume of commissioned computational jobs for the industry.COPAN on the other hand would focus its studies on research, in possible applications of digital computers, on industrial modelling, optimalization and further improvements of the work of the Centre and its computation services for the research institutions of PAN.

In 1963 COPAN had three working digital computers. The Russian imported Urał-2 computer had the most substantial calculation capability.

Its basic speed was 12500 operations per second while the Polish designed and built Emal-2 and Odra-1002 were capable of only 110 and 100-400 operations per second respectively. Nevertheless, as early as the end of 1962, it became obvious that the computational potential of the Centre failed to match the needs and demand and it was necessary to plan for the purchase and installation of new computers.

The academic staff of the Centre recorded some significant research achievements. They were involved in creating original operating systems for computers, programming languages and translators as well as methods of their utilisation. Four volumes of mathematical tables were prepared and delivered for publication.

The Centre conducted intensive research in the area of mathematical statistics and its practical applications. Research work that focussed on computing methods in economy was being intensified. The Centre conducted pioneering research into the application of mathematical methods in medical diagnostics and medical therapy. Research and academic staff of COPAN published the results of their work in scientific journals and periodicals; they authored important scientific books.

The Centre organized scientific conferences, symposia and summer schools both in Poland and abroad and published their proceedings.

The Centre was also involved in close cooperation with other research institutions, which were planing to use digital computers in their activities. At the same time, it was developing close ties with international scientific community.

In 1963 Mieczysław Warmus, summing up various activities of COPAN, wrote:

"...After the initial 18 months of Computation Centre's operation, it is necessary to acknowledge that obtained results would have been impossible to achieve without the contribution and enthusiasm of the Centre's young staff. The prevailing climate of responsibility for assigned tasks reigned supreme from the very birth of the Centre. The Computation Centre is now a well-oiled machine in motion, which does not have to depend on a small group of specialists in the area but is firmly based on teamwork, involving the entire staff.

It is the ambition of the Computation Centre to demonstrate the unquestionable general usefulness of various applications of digital computers and the profitability of the Centre itself in particular. Through the results of their efforts, the Centre's Staff intends to demonstrate that it can purposefully utilise digital computers, which are much faster then Ural-2, and quickly produce financial returns to balance out high costs of importing such computers from abroad. It appears that the results achieved by the Centre to date give good reasons for an optimistic assessment of further development of the Centre."

(Mieczysław Warmus in: "Centrum Obliczeniowe PAN - nowa placówka Akademii".
(Computation Centre of PAN - the newest branch of the Academy).
***Nauka Polska** 1963 nr 4 pp. 101-106)*

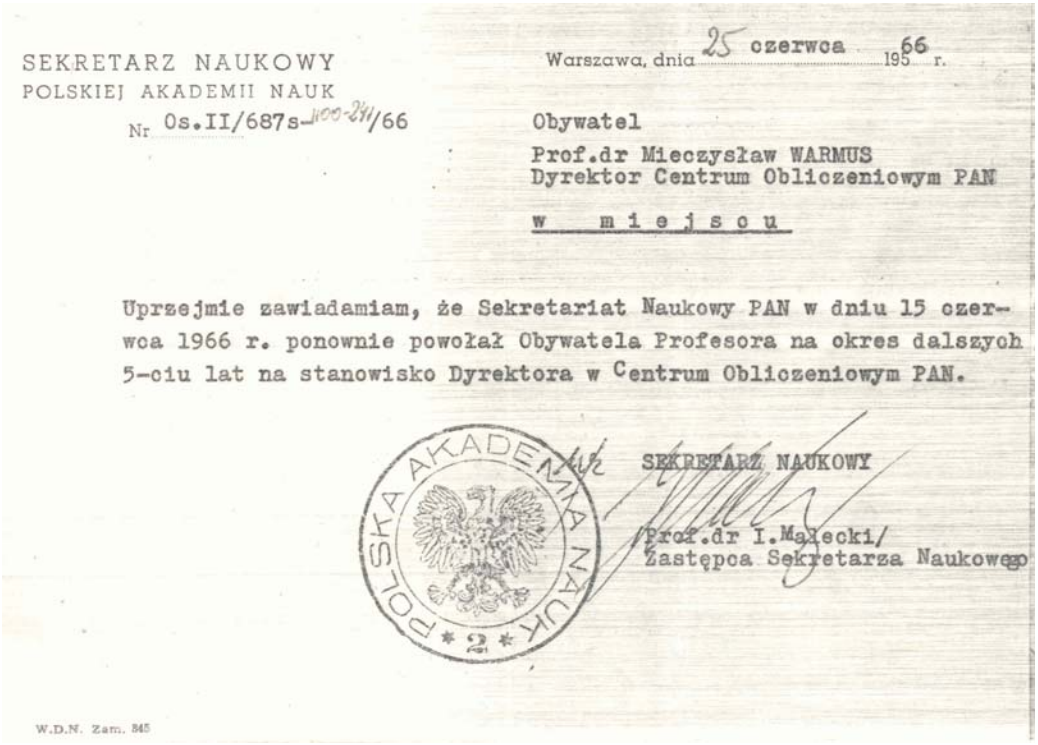
Further development of the Computation Centre of PAN as the basis for the nascent Polish informatics was well summed up by **Adam Teneta** in his article *"Na CO PAN liczy?"* (**Dziennik Polski** nr 305, 1964):

"...The Centre collects all available programs designed in the Centre and other Polish computation centres in the special thematic register. The Centre also keeps the more valuable international publications in the area of applied mathematics and digital computers (almost 6 thousand volumes!). It prepares highly specialized documentation in this narrow but extremely dynamic discipline and publishes its own research papers.

This year alone, COPAN staff published 48 research papers and several hundred

press publications. The Centre is also a birthplace of totally original textbooks in this discipline. The Centre conducts as many as seven highly specialised seminars. Since its inception, the Centre registered110 published items and tens of quires of print…"

The Polish Academy of Sciences authorities were obviously very pleased with the organizational work of Professor Warmus and with the initial successes of the research institution in his charge, as he was subsequently appointed to continue in his position as the Director of COPAN for the following term.



SEKRETARZ NAUKOWY
POLSKIEJ AKADEMII NAUK
Nr Os.II/687s-100-241/66

Warszawa, dnia 25 czerwca 1966 r.

Obywatel
Prof.dr Mieczysław WARMUS
Dyrektor Centrum Obliczeniowym PAN
w m i e j s c u

Uprzejmie zawiadamiam, że Sekretariat Naukowy PAN w dniu 15 czerwca 1966 r. ponownie powołał Obywatela Profesora na okres dalszych 5-ciu lat na stanowisko Dyrektora w Centrum Obliczeniowym PAN.

POLSKA AKADEMIA NAUK * 2 *

SEKRETARZ NAUKOWY
/Prof.dr I.Malecki/
Zastępca Sekretarza Naukowego

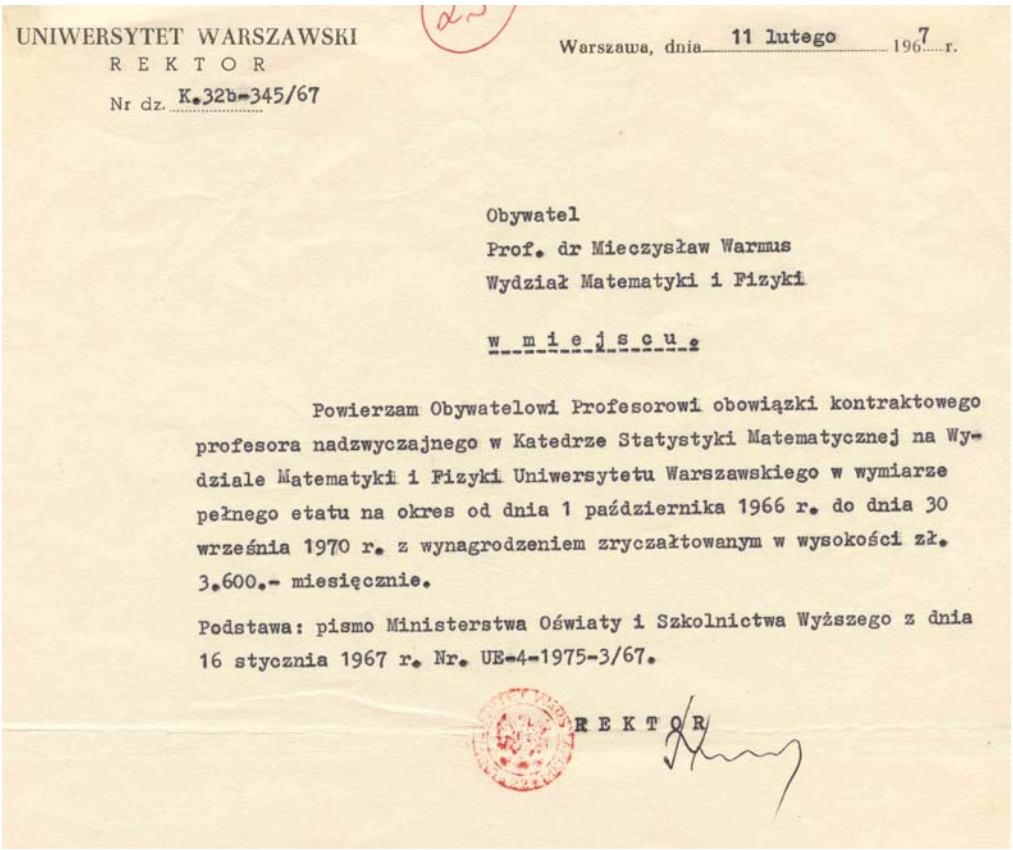
W.D.N. Zam. 845

Document 28. Professor Warmus's letter of appointment as Director (another term).

Numerous and onerous duties of this important Director position such a prestigious research institute as Computation Centre of the Polish Academy of Science did not slow Professor Warmus in his own research work. In May 1962 Professor Warmus was appointed to a position of an Associate Professor in COPAN.

In 1964 he lectured in the GIER-ALGOL programming language in the Warsaw Polytechnic and in the Computation Centre of PAN.

In 1966, the Chancellor of the University of Warsaw appointed Mieczysław Warmus to a position of an Associate Professor and Head of the Mathematical Statistics in the Faculty of Mathematics and Physics of the University of Warsaw.



UNIWERSYTET WARSZAWSKI
REKTOR
Nr dz. K.32b-345/67

Warszawa, dnia 11 lutego 1967 r.

Obywatel
Prof. dr Mieczysław Warmus
Wydział Matematyki i Fizyki

w miejscu.

Powierzam Obywatelowi Profesorowi obowiązki kontraktowego profesora nadzwyczajnego w Katedrze Statystyki Matematycznej na Wydziale Matematyki i Fizyki Uniwersytetu Warszawskiego w wymiarze pełnego etatu na okres od dnia 1 października 1966 r. do dnia 30 września 1970 r. z wynagrodzeniem zryczałtowanym w wysokości zł. 3.600.- miesięcznie.

Podstawa: pismo Ministerstwa Oświaty i Szkolnictwa Wyższego z dnia 16 stycznia 1967 r. Nr. UE-4-1975-3/67.

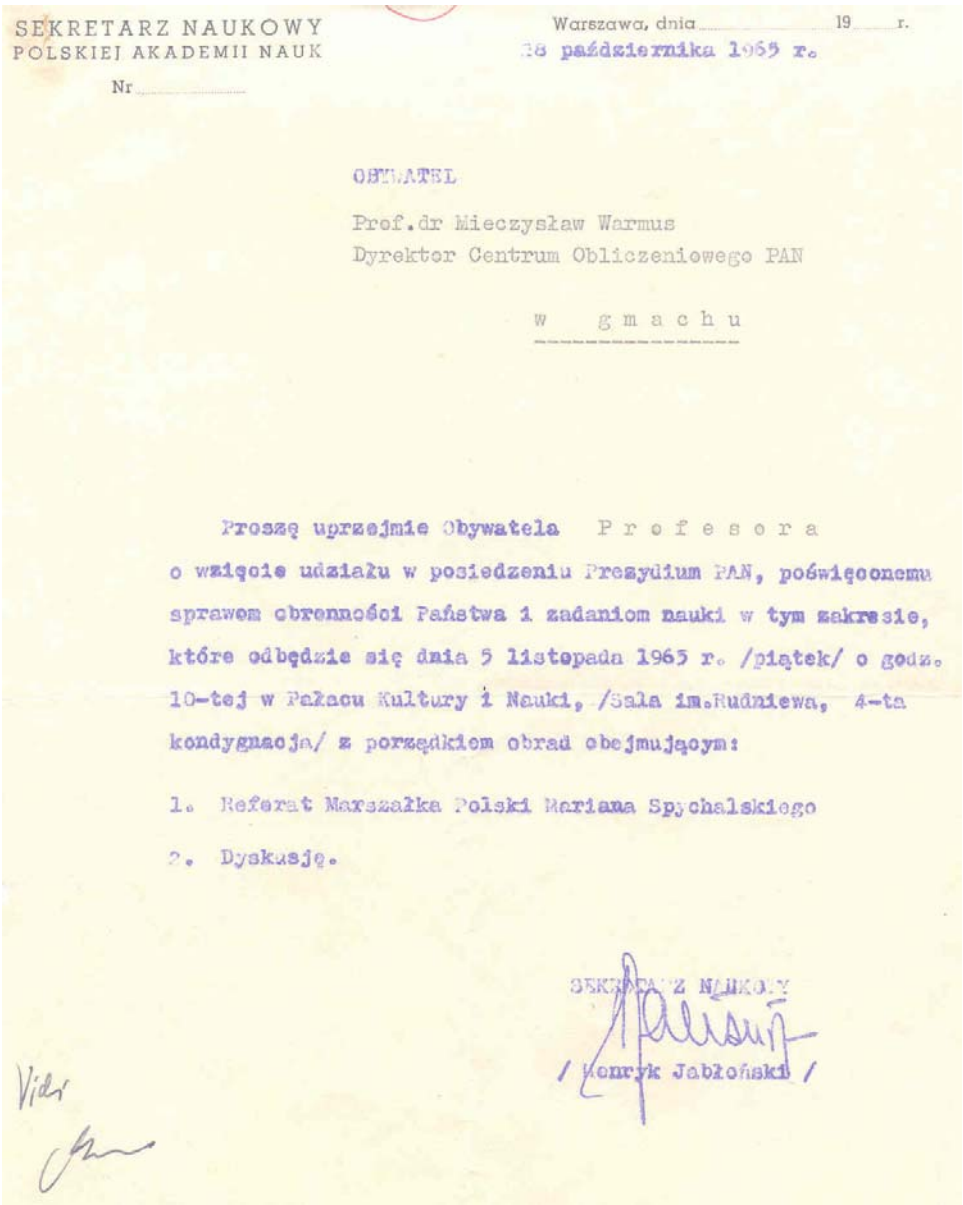
REKTOR

Document 29. Letter of appointment, Associate Professor, University of Warsaw

Professor Warmus was a member of the Automatics and Cybernetics Committee in the IV Department of Sciences of the Polish Academy of Sciences.

Together with medical researchers and scientists, Professor Warmus was working on the application of mathematical methods in solving important diagnostic and therapeutic problems in medicine.
In the years 1966-68, with a team of highly specialized medical practitioners, Professor Warmus published several research papers on the application of mathematical models in solving complicated diagnostic and therapeutical problems in medical conditions including diabetes, anaemia, obesity, cardiovascular hypertension and cardiac problems. These types of scientific research were very innovative in Poland at that time and the application of digital computers in medicine was still in its experimental stage.

Apart from the above-mentioned research, during that time Professor Warmus also published many papers in the area of applied mathematics, prepared programming textbooks as well as mathematical tables. He enjoyed unquestionable respect among his co-workers and junior researchers as well as among the leadership of PAN and the government authorities. In recognition of his expertise Professor Warmus was frequently invited to high-level meetings involving state authorities.



SEKRETARZ NAUKOWY
POLSKIEJ AKADEMII NAUK

Nr

Warszawa, dnia 19 r.
18 października 1965 r.

OBYWATEL

Prof.dr Mieczysław Warmus
Dyrektor Centrum Obliczeniowego PAN

w g m a c h u

Proszę uprzejmie Obywatela P r o f e s o r a o wzięcie udziału w posiedzeniu Prezydium PAN, poświęconemu sprawom obronności Państwa i zadaniom nauki w tym zakresie, które odbędzie się dnia 5 listopada 1965 r. /piątek/ o godz. 10-tej w Pałacu Kultury i Nauki, /Sala im.Rudniewa, 4-ta kondygnacja/ z porządkiem obrad obejmującym:

1. Referat Marszałka Polski Mariana Spychalskiego
2. Dyskusję.

SEKRETARZ NAUKOWY
/ Henryk Jabłoński /

Vidi

Document 30. An invitation to a meeting on defence issues

Helena, Professor Warmus's wife, played an important role in his professional life and career. Taking on herself most of the duties related to bringing up their children, and caring for Professor Warmus's elderly parents, she also took charge of the whole household to create a pleasant and homely atmosphere in which the Professor could relax.
She was the person in whom he could confide his work-related problems and difficulties.

Such division of duties undoubtedly created an atmosphere conducive to her husband's unburdened engagement in productive research work.
They both enjoyed music and frequently went to see operas and operettas and participated in New Year balls and parties.

23. Helena and Mieczysław Warmus at a ball in Jabłonna Palace

Frequent Sunday outings to popular recreation spots were another favourite form of relaxation for the whole Warmus family. Those occasions offered Professor Warmus an opportunity to indulge in his favourite youth pastime - photography.

With his camera he recorded some memorable moments spent with his family enjoying natural scenery.

24. Warmus family in Międzyzdroje

25. Tomek, Helena, Bożena and Teresa Warmus, Augustów 1959

Professor Warmus's mother Anna, aged seventy-two, died a year after their move from Wrocław to Warsaw. Her departure left a gaping hole in the life of the family. Sensitive, delicate, tactful and extremely intelligent, she was well liked and respected by the whole family. Helena Warmus, who had lost her own mother very early in her youth, treated Anna Warmus as her surrogate mother.
The death of Anna Warmus was a great loss to Professor himself, his wife and children but it was particularly painful loss to Jan Warmus, the Professor's father, who became a widower at the age of seventy-seven. Free of major ailments he tried to make himself useful around the house, which provided some relief for Helena in her numerous everyday chores.

In 1964, the youngest child in the family, son Tomasz, was already nine years old. The elder daughter Teresa was a seventeen-year-old teenager and the middle daughter Bożena was fourteen.

26. Teresa

27. Tomek

28. Bożena

The family decided together that it was time for Mrs Helena Warmus to resume her tertiary studies, which she had abandoned seventeen years earlier to devote all her time to the care of her young family. She recommenced her studies at the Faculty of Polish and Slavic Studies at the University of Warsaw to major in Russian Studies.

The 1968 political events were not the proudest moments in the history of communist Poland. The improvement in living standards promised by the communist authorities was far too slow. The glaring disparity between the standard of living of the governing party elites and the rest of the Polish society was the constant source of general bitterness and irritation. In addition, the period was characterised by the increased political censorship and intolerance for alternative views in cultural life. The increasing social discontent was particularly rife among the university students and the intellectuals. The communist authorities provided the spark when they decided to ban the theatre performance of Adam Mickiewicz play *Dziady (Forefathers' Eve)*, directed by K. Dejmek. The communist censorship deemed the performance to contain some anti-Soviet inferences.

On 8 March of that year, students organised street demonstrations to protest the decision to ban *Dziady*. The demonstrations were brutally suppressed by the formations of the communist police (MO – Milicja Obywatelska) and special security forces (SB-Służba Bezpieczeństwa). Many students were beaten and arrested. The whirlwind of those momentous political events of the 1968 sucked in many people who were not even committed. It was simply an ideal opportunity to get rid off all non-conformists or those who stood in the way of one's career.

It was on the 8th of March 1968 that Professor Mieczysław Warmus entered the lecture hall in the Palace of Culture and Science in Warsaw. According to his timetable, he was to lecture in statistical mathematics for the third year students of the Mathematics and Physics Faculty at the University of Warsaw.

Students, usually well disciplined and quiet, were on that occasion rather restless and irritated by the unprovoked and undeserved brutal intervention of the police force. They reported to the Professor the instances of brutal beatings of their colleagues. They were getting ready to move into the streets to rejoin demonstrations.
Realizing how dangerous consequences such action could have for the students, Professor Warmus used all his authority to keep them inside the building and off the streets.
He proposed that it would be much more productive to write a petition to the communist government to convey all their grievances and demands.
His action, which saved many students from beatings, imprisonment and likely expulsion from the University, had some rather unexpected and serious consequences for the Professor himself.

In the second half of March 1968, the family home of Mr and Mrs Warmus was set upon by unexpected and uninvited guests. The communist security agents had been waiting for a long time for such an opportunity. According to their "file" on Mieczysław Warmus, he was always a suspect and a potential enemy of the communist system. Many aspects of his life seemed to have led the communist authorities to such an assumption:

- He was brought up in the Catholic faith. Even before the war, Professor Warmus was a member of a Catholic academic youth organization *Iuventus Christiana.* He remained in touch with the former members of that organization.
- He fought in the Warsaw Uprising during the Second World War.
- After the war, as a young academic employed by the University and Polytechnic of Wrocław, he actively participated in the life of catholic intelligentsia and was one of the founding members of the Wrocław Chapter of *Iuventus Christiana.*
- He continued to remain in touch with many of his colleagues from Stefan Batory College, who were members of the scouting movement ("Szare Szeregi") involved in the struggle against the German occupiers.
- In 1957 Professor Warmus co-founded Catholic Intelligentsia Club in Wrocław.
- Professor Warmus maintained close contact with his elder sister, Janina Bołaszewska, who did not return to Poland after the war and lived in Canada.

For the communist authorities any of these reasons was a very serious crime against the state. However, the most serious "crime" of Professor Warmus, in the eyes of the communist security apparatus, was the fact that he never joined the governing party.

However, the actual accusations against Professor Warmus officially had nothing to do with the above list. Rather, he was presented with clumsily fabricated accusations of economic mismanagement, accusations which, as everyone knew, lacked any credibility.
Professor Warmus clearly and logically refuted each and every accusation with the support of solid evidence. Three months of intensive investigations in the Computation Centre failed to produce any evidence of mismanagement the "communist authorities" hoped to find.

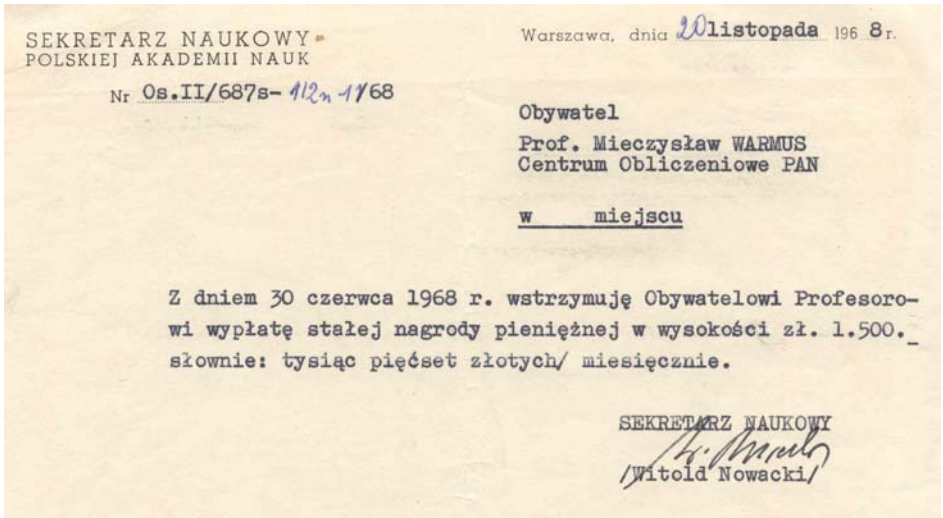
However, for the security apparatus the main aim of the exercise was not the investigation itself but a smear campaign to discredit the person they no longer needed. The media announced that Director of COPAN took the side of the demonstrating students against the communist authorities.

It was quite obvious for the Professor that security forces and communist leadership wanted him removed from his directorial position in COPAN.

On the 30th of May 1968, Mieczysław Warmus tendered his resignation from the position of Director of the Computation Centre in the Polish Academy of Sciences. It was only on the following day that he was officially informed that all accusations, which had led to his resignation, were found to be, in fact, groundless. From 1 June of that year Professor Warmus remained in COPAN only as an ordinary independent researcher. This change took place on the Professor's fiftieth birthday.

The persecutions, which Professor Warmus was subjected to, were also directed at his family. In July 1968, his eighteen-year-old daughter Bożena sat for her university entrance examinations in the Faculty of Polish Studies, University of Warsaw. On the day the results were published, her name failed to appear among those that had been offered a place. It could not be found on the list of those that passed the exam but failed to be offered a place, nor was it on the list of those that failed to pass the examination. Later investigation of the matter revealed that her student file went missing in the Faculty. It simply disappeared…All document traces relating to Bożena actually sitting the examination in the Faculty of Polish Studies were also missing…She was simply told that perhaps she would have more luck the following year…

On the fiftieth anniversary of the National Bureau of Statistics (1918-1968), Professor Mieczysław Warmus was awarded a special medal "For Longstanding Commitment to Polish Statistics".
The same year saw the publication of the further five research papers in medical applications of mathematics produced in collaboration with a team of medical researchers [item 53-57].
In November 1968, Professor Warmus received a letter rescinding his permanent monthly salary supplement retrospectively, taking effect from June of that year.



SEKRETARZ NAUKOWY
POLSKIEJ AKADEMII NAUK

Nr Os.II/687s-112n-1/68

Warszawa, dnia 20 listopada 1968 r.

Obywatel
Prof. Mieczysław WARMUS
Centrum Obliczeniowe PAN

w miejscu

Z dniem 30 czerwca 1968 r. wstrzymuję Obywatelowi Profesorowi wypłatę stałej nagrody pieniężnej w wysokości zł. 1.500._
słownie: tysiąc pięćset złotych/ miesięcznie.

SEKRETARZ NAUKOWY
/Witold Nowacki/

Document 31. Letter revoking the salary supplement.

Warsaw 1969 - 1984

From the middle of 1968, Professor Mieczysław Warmus remained in COPAN as an academic researcher and devoted all his time to research. Unburdened by administrative duties, he could dedicate all his time to his life-long research passions and interests. Were it not for the bitter aftertaste of the preceding months, he could not have been more content with this turn of events. The very aim of his long struggle was now a reality. He created and led the Computation Centre of PAN, the first Polish academic, research and training centre endowed with a well functioning digital computer. The Warsaw Centre was now a model institution for other regional centres. Digital computing machines (by then simply called computers) were being brought in from abroad. Computers were more frequently utilized in the industry and other branches of national economy. In hindsight of many years it became obvious that Professor Warmus's vision involving widespread use of digital computers was absolutely correct.

At that stage Professor Warmus turned to an area, which had interested him for quite some time, namely the application of mathematical methods in medical science. The Professor took interest in that discipline not only as a mathematician. It was of enormous significance for the Professor that mathematical science should also serve human needs and, in the case of medicine, could be quite helpful in reducing the extent of human suffering.
From 1965 onwards, Professor Warmus worked closely with Professor Beata Bogdanik and Professor Tadeusz Bogdanik and a group of medical specialists from the 1St Clinic of Internal Medicine in the city of Łódź. This close cooperation now further intensified, branching out to other areas of medicine.
In the years 1969-1970, Professor Warmus co-authored the following three papers:

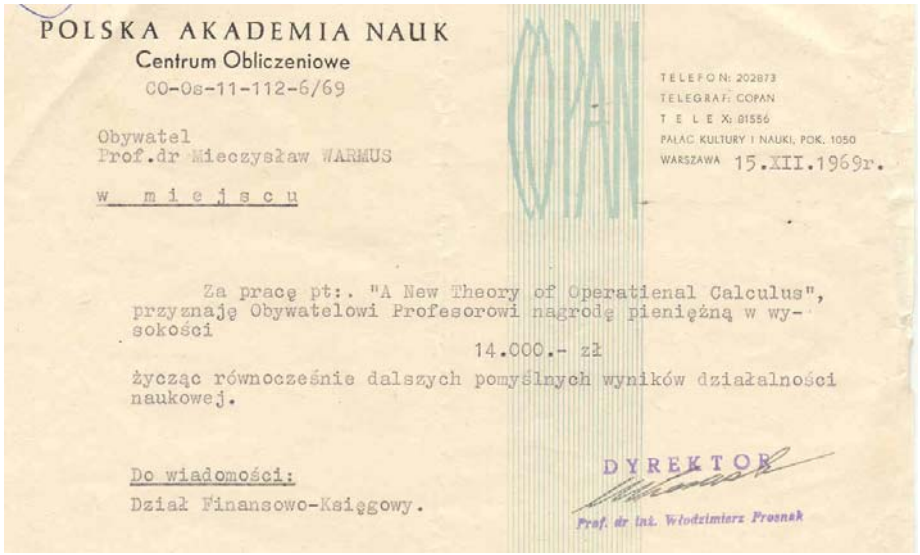
- T. Bogdanik, B. Bogdanikowa, M. Warmus, J. Drozd, A. Woszczyk, K.Bernacka, O. Redźko. *Application des méthodes mathématiques pour une différenciation des constellacions des protéines sur électro et immunophorogrammes* [item 59];
- M. Warmus, T. Bogdanik, K. Styś, A. Nakończy, W. Mikke, A. Wasilewska. *Praktyczne zastosowanie plastycznych geometrycznych modeli krzywych cukrowych (Practical application of spatial geometrical models of sugar curves)* [item 60]; and
- M. Warmus, T. Bogdanik, J. Wartak, A. Wasilewska, A. Nakończy. *Application of Automatic Analysis to Diagnosis in Diabetology* [item 61].

In 1969, Professor Warmus took part in the 5th International Mathematical Congress in Weimar (then in the German Democratic Republic). In the same year Professor Warmus presented his published article *Zastosowanie Metod Matematycznych*

w Statystyce (Application of Mathematical Methods in Statistics) [item 52] at the 6th Plenary Session of the Scientific Statistical Council.

Mrs. Helena Warmus was then finalizing her studies at the Faculty of Polish and Slavonic Studies at the University of Warsaw. On the 17th of June 1969, she received her Master's degree in Russian Studies. Soon after, she began teaching Russian at the Academy of Planning and Statistics at the Faculty of Foreign Trade. Her salary went a long way in filling the great hole in the family budget created by Professor Warmus's resignation from his directorial position at the Centre.

In April 1969, Professor Warmus's term as a member of the Scientific Committee for Automatics and Cybernetics of PAN came to an end.
In December 1969, he received a special financial award for his paper entitled *A New Theory of Operational Calculus* [item 62], published in **Dissertationes Mathematicae** LXXX, Warszawa 1971, pp. 1-50.



POLSKA AKADEMIA NAUK
Centrum Obliczeniowe
CO-Os-11-112-6/69

TELEFON: 202873
TELEGRAF: COPAN
TELEX: 81556
PAŁAC KULTURY I NAUKI, POK. 1050
WARSZAWA 15.XII.1969r.

Obywatel
Prof.dr Mieczysław WARMUS

w miejscu

Za pracę pt:. "A New Theory of Operatienal Calculus", przyznaję Obywatelowi Profesorowi nagrodę pieniężną w wysokości

14.000.- zł

życząc równocześnie dalszych pomyślnych wyników działalności naukowej.

DYREKTOR
Prof. dr inż. Włodzimierz Prosnak

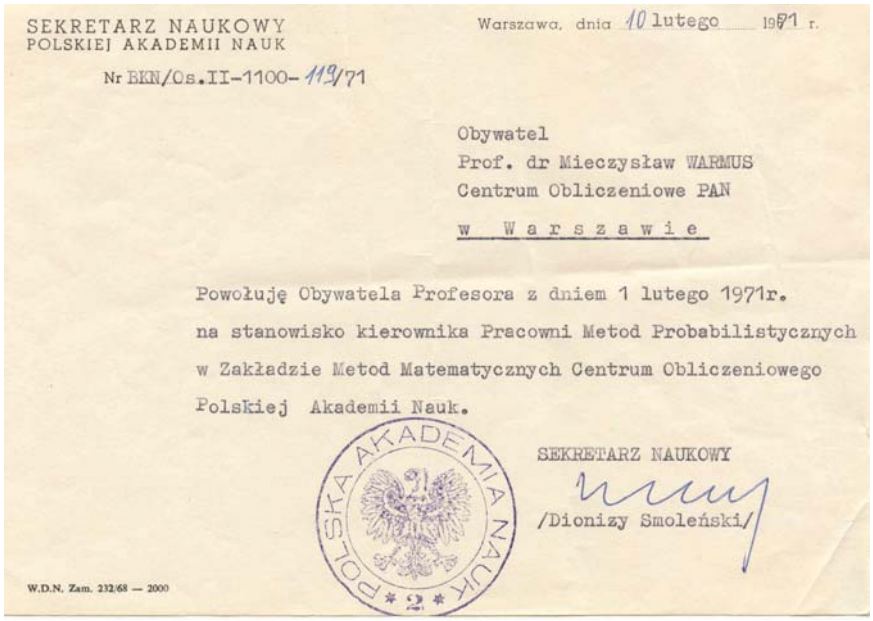
Do wiadomości:
Dział Finansowo-Księgowy.

Letter of Award

The end of the sixties and the beginning of the seventies were generally characterized by the growing social discontent in the countries of the so-called "socialist camp". The deteriorating economic situation in Poland and considerable decrease in living standards coupled with dramatic restrictions of civic liberties imposed on Poles, inevitably led to a significant rise in frictions between the country's communist rulers and all strata of the Polish society.
Numerous incarcerations of people in Warsaw, Łódź, Lublin and Wrocław, charged with the customary "circulating of printed materials that was criticizing the authorities of the Polish Peoples' Republic (PRL)", were in stark contrast to the officially professed slogans describing Poland as the country of "people's democracy". When, at long last, a wave of popular strikes swept across the entire

country, “people’s authorities”, now seriously concerned and frightened, ordered their security forces to shoot at the workers on their way to work at the Gdańsk Shipyard. This was the culminating moment in the history of conflict between the whole nation and the communist party apparatus.
The best and the most effective way of dealing with social crises and calming the social discontent had always been a change of the communist leader. Towards the end of 1970, the Polish Peoples’ State was given a brand new General Secretary of the governing communist party (PZPR). The beginning of 1971 marked the onset of another political “thaw” - a characteristic cyclical period in the history of the communist rule in Poland.
The “thaw”, so characteristically Polish phenomenon of the political cycle, in the prevailing climate simply meant a temporary and superficial loosening of the rigorous political restrictions of the preceding period followed by cosmetic changes at the top echelon of the communist authorities. It was usually accompanied by attempts of superficially redressing some of the wrongs inflicted on individuals. Following the changes at the top communist political hierarchy, the beginning of the seventies seemed to indicate new political directions, including greater openness in contacts with the western world, which created new opportunities in industrial, scientific and technical cooperation. The “thaw” penetrated even into the state-run institutions such as the Polish Academy of Sciences (PAN), where attempts were made to redress the wrongs perpetrated during the preceding period.

In early February of 1971 Professor Mieczysław Warmus received a „promotion”. He was appointed to manage the Section of the Probabilistic Methods in the Department of Mathematical Methods at the Computation Centre of PAN.



SEKRETARZ NAUKOWY
POLSKIEJ AKADEMII NAUK

Warszawa, dnia 10 lutego 1971 r.

Nr BKN/Os.II-1100-119/71

Obywatel
Prof. dr Mieczysław WARMUS
Centrum Obliczeniowe PAN
w Warszawie

Powołuję Obywatela Profesora z dniem 1 lutego 1971r.
na stanowisko kierownika Pracowni Metod Probabilistycznych
w Zakładzie Metod Matematycznych Centrum Obliczeniowego
Polskiej Akademii Nauk.

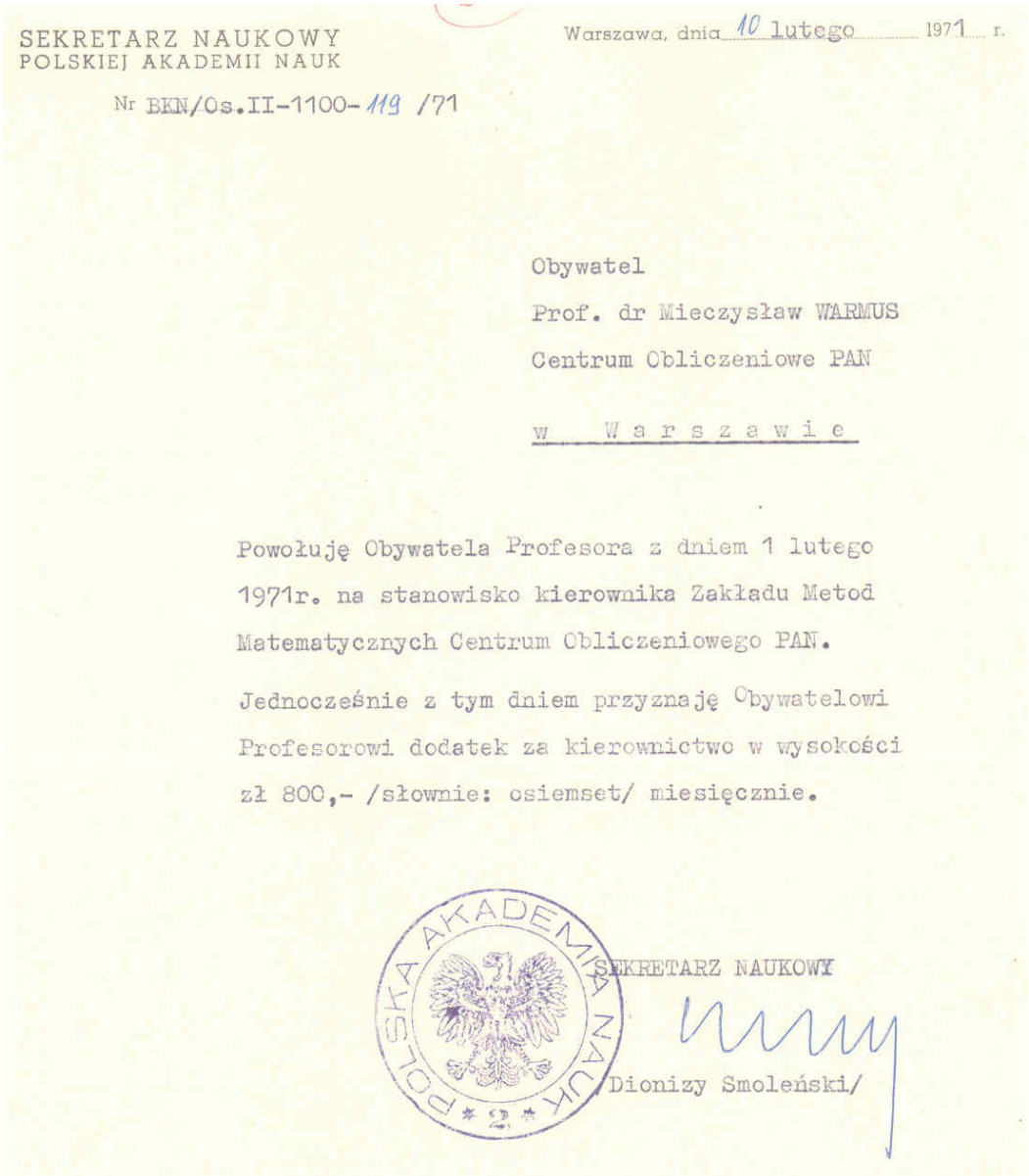
POLSKA AKADEMIA NAUK

SEKRETARZ NAUKOWY
/Dionizy Smoleński/

W.D.N. Zam. 232/68 — 2000

Letter
of Appointment

Simultaneously he was appointed to head the Department of Mathematical Methods of COPAN.



SEKRETARZ NAUKOWY
POLSKIEJ AKADEMII NAUK

Warszawa, dnia 10 lutego 1971 r.

Nr BKN/Os.II-1100-119 /71

Obywatel
Prof. dr Mieczysław WARMUS
Centrum Obliczeniowe PAN
w Warszawie

Powołuję Obywatela Profesora z dniem 1 lutego 1971r. na stanowisko kierownika Zakładu Metod Matematycznych Centrum Obliczeniowego PAN.

Jednocześnie z tym dniem przyznaję Obywatelowi Profesorowi dodatek za kierownictwo w wysokości zł 800,- /słownie: osiemset/ miesięcznie.

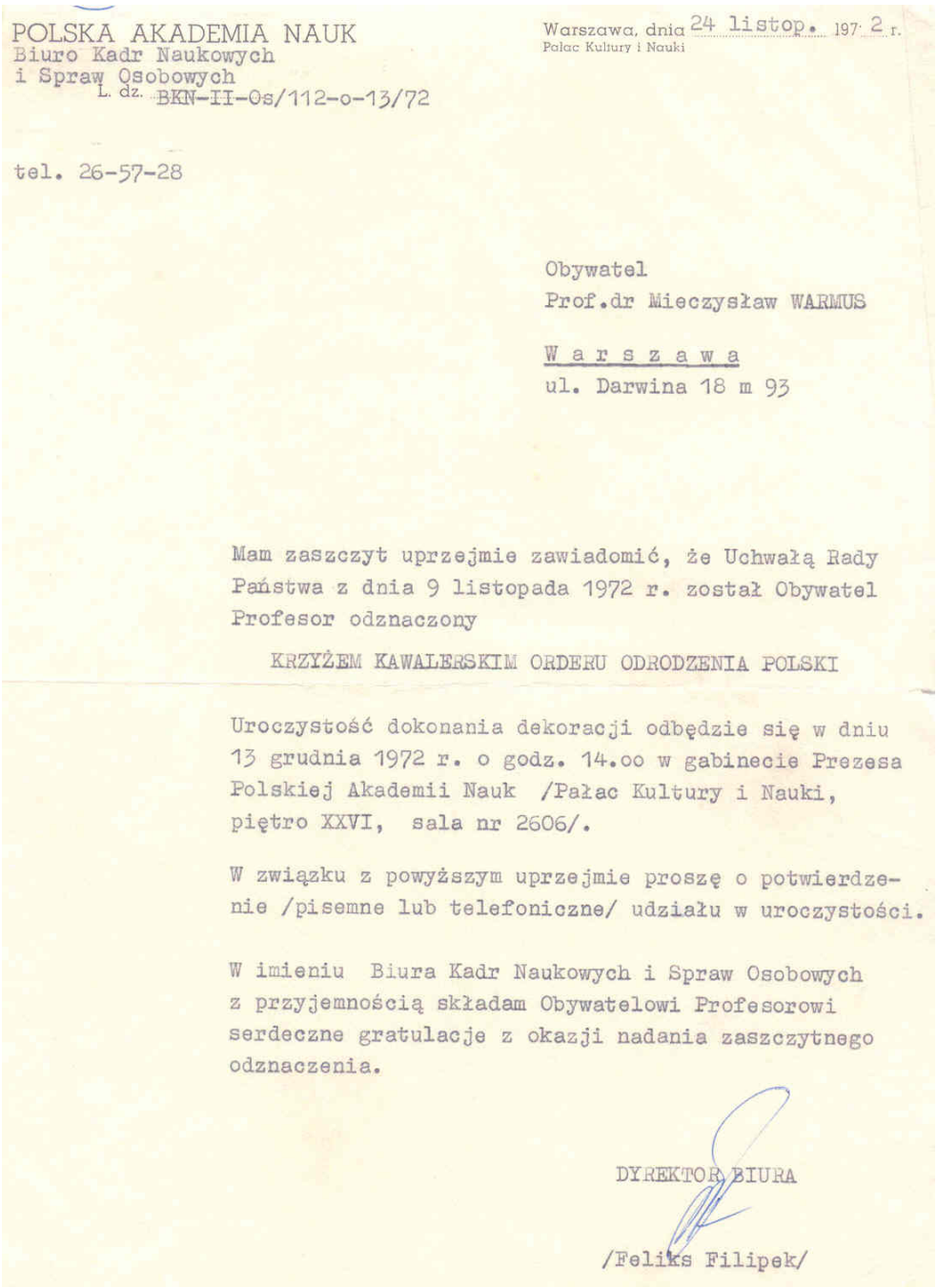
POLSKA AKADEMIA NAUK * 2 *

SEKRETARZ NAUKOWY
/Dionizy Smoleński/

Letter of Appointment

It was indeed a rather dubious honor, considering his previous positions from which he was removed by political machinations.

In November 1972, Professor Warmus, nominated by the Office of Research Personnel of the Polish Academy of Sciences, was awarded, by the decree of the Council of State, the Knight Cross of the Polish Revival.



POLSKA AKADEMIA NAUK
Biuro Kadr Naukowych
i Spraw Osobowych
L. dz. BKN-II-Os/112-o-13/72

Warszawa, dnia 24 listop. 1972 r.
Pałac Kultury i Nauki

tel. 26-57-28

Obywatel
Prof.dr Mieczysław WARMUS

Warszawa
ul. Darwina 18 m 93

Mam zaszczyt uprzejmie zawiadomić, że Uchwałą Rady Państwa z dnia 9 listopada 1972 r. został Obywatel Profesor odznaczony

KRZYŻEM KAWALERSKIM ORDERU ODRODZENIA POLSKI

Uroczystość dokonania dekoracji odbędzie się w dniu 13 grudnia 1972 r. o godz. 14.oo w gabinecie Prezesa Polskiej Akademii Nauk /Pałac Kultury i Nauki, piętro XXVI, sala nr 2606/.

W związku z powyższym uprzejmie proszę o potwierdzenie /pisemne lub telefoniczne/ udziału w uroczystości.

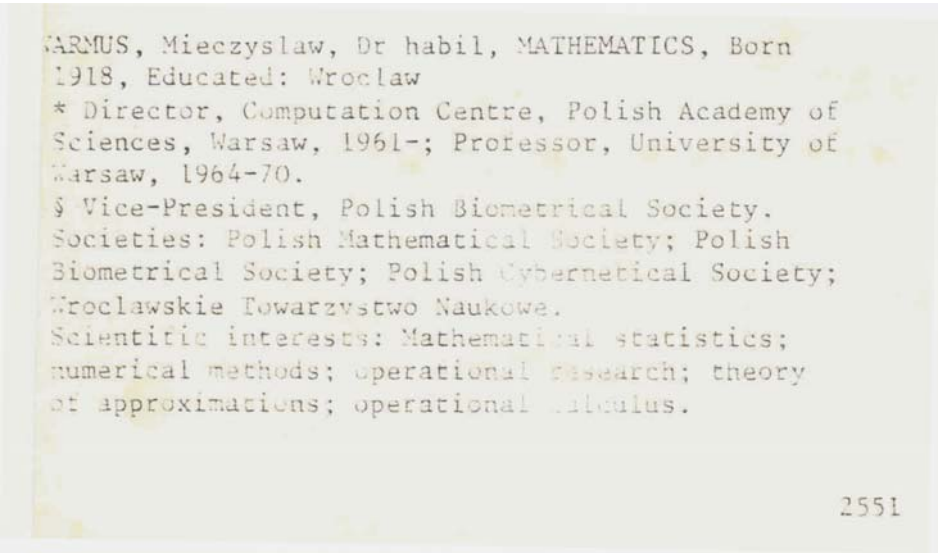
W imieniu Biura Kadr Naukowych i Spraw Osobowych z przyjemnością składam Obywatelowi Profesorowi serdeczne gratulacje z okazji nadania zaszczytnego odznaczenia.

DYREKTOR BIURA

/Feliks Filipek/

Letter of Award

In 1972, his name appeared in *Who's Who in Science in Europe: a reference guide to European scientists*, Vol. 4 (R-Z), p. 2551, F. Hodgson, Guernsey, Second Edition 1972.



ARMUS, Mieczyslaw, Dr habil, MATHEMATICS, Born 1918, Educated: Wroclaw
* Director, Computation Centre, Polish Academy of Sciences, Warsaw, 1961-; Professor, University of Warsaw, 1964-70.
§ Vice-President, Polish Biometrical Society.
Societies: Polish Mathematical Society; Polish Biometrical Society; Polish Cybernetical Society; Wroclawskie Towarzystwo Naukowe.
Scientific interests: Mathematical statistics; numerical methods; operational research; theory of approximations; operational calculus.

2551

Who's Who entry

In June 1973, the Council of the State, in its decree, elevated Mieczysław Warmus to full professorship (Życie Warszawy No 135, 7 June 1973).

(W) NR 135 7 CZERWCA 1973 R.

kraju z kraju

Nowo mianowani profesorowie

(P) Uchwałą Rady Państwa tytuły naukowe otrzymali:

Tytuł naukowy profesora zwyczajnego:

NAUK HUMANISTYCZNYCH:

Mieczysław Brożek — prof. nadzw. w Uniwersytecie Jagiellońskim w Krakowie, **Stanisław Jodłowski** — prof. nadzw. w Uniwersytecie Jagiellońskim w Krakowie, **Ewa Ostrowska** — prof. nadzw. w Uniwersytecie Jagiellońskim w Krakowie;

NAUK LEŚNYCH:

Edward Kamiński — prof. nadzw. w Akademii Rolniczej w Warszawie;

NAUK MATEMATYCZNYCH:

Marek Kuczma — prof. nadzw. w Uniwersytecie Śląskim w Katowicach, **Mieczysław Warmus** — prof. nadzw. w Centrum Obliczeniowym PAN w Warszawie;

doc. w Politechnice Szczecińskiej, **Zbigniew Landau** — doc. w Szkole Głównej Planowania i Statystyki w Warszawie;

NAUK FARMACEUTYCZNYCH:

Adolf Fiebig — doc. w Akademii Medycznej w Gdańsku;

NAUK FIZYCZNYCH:

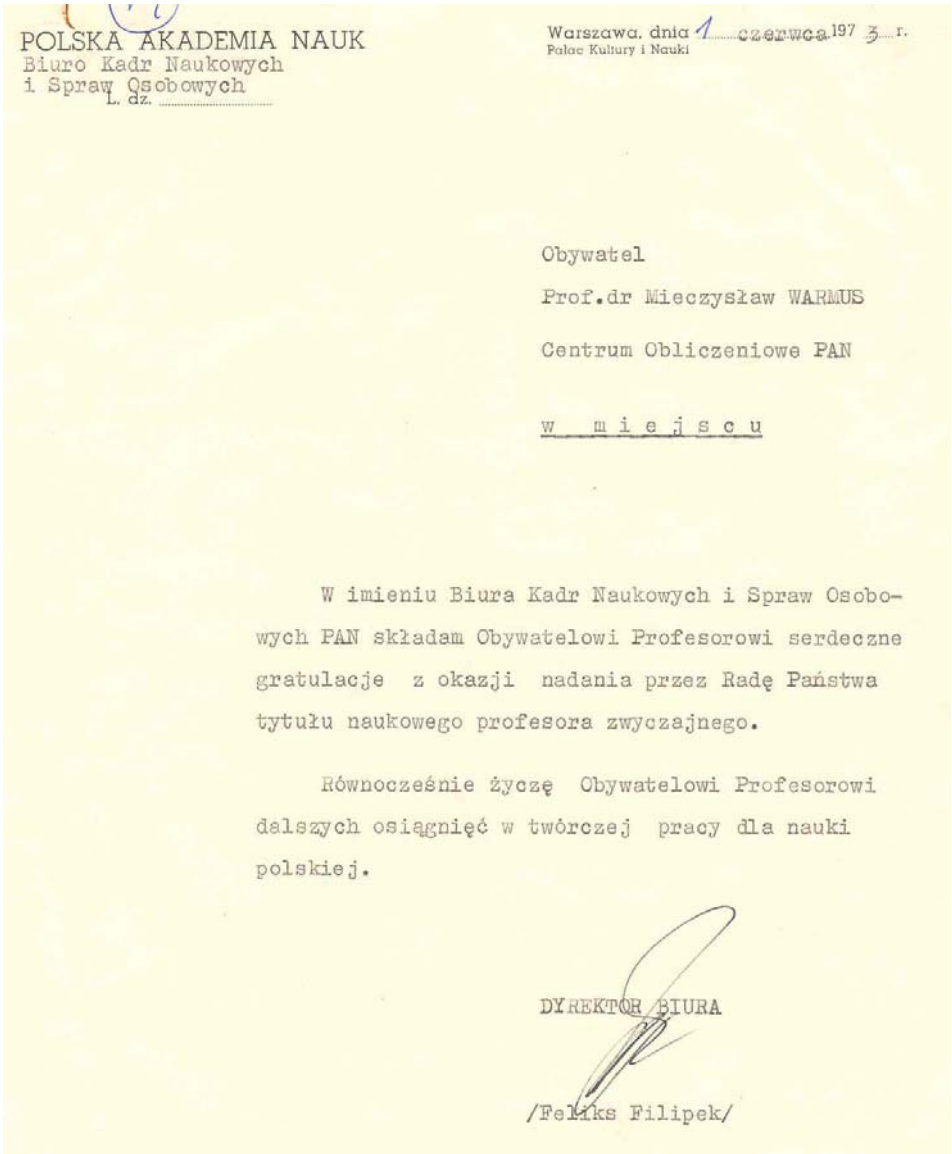
Jerzy Małecki — doc. w Instytucie Fizyki PAN — Zakład Fizyki Dielektryków w Poznaniu;

NAUK HUMANISTYCZNYCH:

Janina Bieniarz — doc. w Wyższej Szkole Ekonomicznej w Krakowie, **Władysław Bortnowski** — doc. w Uniwersytecie Łódzkim, **Tadeusz Gospodarek** — doc. w Wyższej Szkole Pedagogicznej im. Powstańców Śląskich w Opolu, **Leszek Hajdukiewicz** — doc. w Uniwersytecie Jagiellońskim w Krakowie, **Edmund Jankowski** — doc. w Instytucie Badań Literackich PAN w Warszawie, **Henryk Jankowski** — doc. w Uniwersytecie Warszawskim, **Zofia Karczew-**

Newspaper cutting announcing Professor Warmus's full professorship

This latest recognition materialized on the day of his 55th birthday, and exactly five years after he had been forced to resign from his position of Director of the Computation Centre in PAN; the first Centre of nascent informatics in Poland, established by Professor Warmus.



POLSKA AKADEMIA NAUK
Biuro Kadr Naukowych
i Spraw Osobowych
L. dz. .....

Warszawa, dnia 1 czerwca 197 3 r.
Pałac Kultury i Nauki

Obywatel
Prof.dr Mieczysław WARMUS
Centrum Obliczeniowe PAN
w m i e j s c u

W imieniu Biura Kadr Naukowych i Spraw Osobowych PAN składam Obywatelowi Profesorowi serdeczne gratulacje z okazji nadania przez Radę Państwa tytułu naukowego profesora zwyczajnego.

Równocześnie życzę Obywatelowi Profesorowi dalszych osiągnięć w twórczej pracy dla nauki polskiej.

DYREKTOR BIURA
/Feliks Filipek/

Congratulatory letter on Professor Warmus's full professorship

These honors created only illusions of attempts to redress the earlier wrongs. In reality, Professor Warmus never again enjoyed the confidence of Party apparatchiks and communist academic authorities. He was kept effectively isolated from the intellectual life of the country.

His contract to lecture and head the Section of Mathematical Statistics in the Faculty of Mathematics of the University of Warsaw was allowed to lapse in September of 1970 and was not renewed. Over the following several years, his business and academic overseas travels would be severely restricted and then only limited to visits to the so-called "other socialist countries". He was only allowed to continue leading the Mathematical Methods Section, which was a small, and rather insignificant, cell within the Computation Centre of PAN.

The seventies and the beginning of the eighties constituted the most productive period in Professor Warmus's cooperation and collaboration with eminent Polish scientists and researchers in the field of medicine. He worked closely with a group of doctors in the 1St Clinic of Internal Medicine in Łódź. Their research covered a wide area of medical science. Professor Warmus also established cooperative link with the Institute of Hematology in the Medical Academy of Krakow. This cooperation was very productive and bore fruit in many publications on the subject of the application of mathematical models in diagnostic methods and therapies in leukemia [items 85, 88-90, 98, 104]. In 1979, Professor Warmus took the position of full professor in the Acute Poisoning Clinic in the Institute of Occupational Medicine in Łódź. Together with doctors from the Institute, he was working on the application of mathematical methods in diagnosis and therapies of acute poisonings.

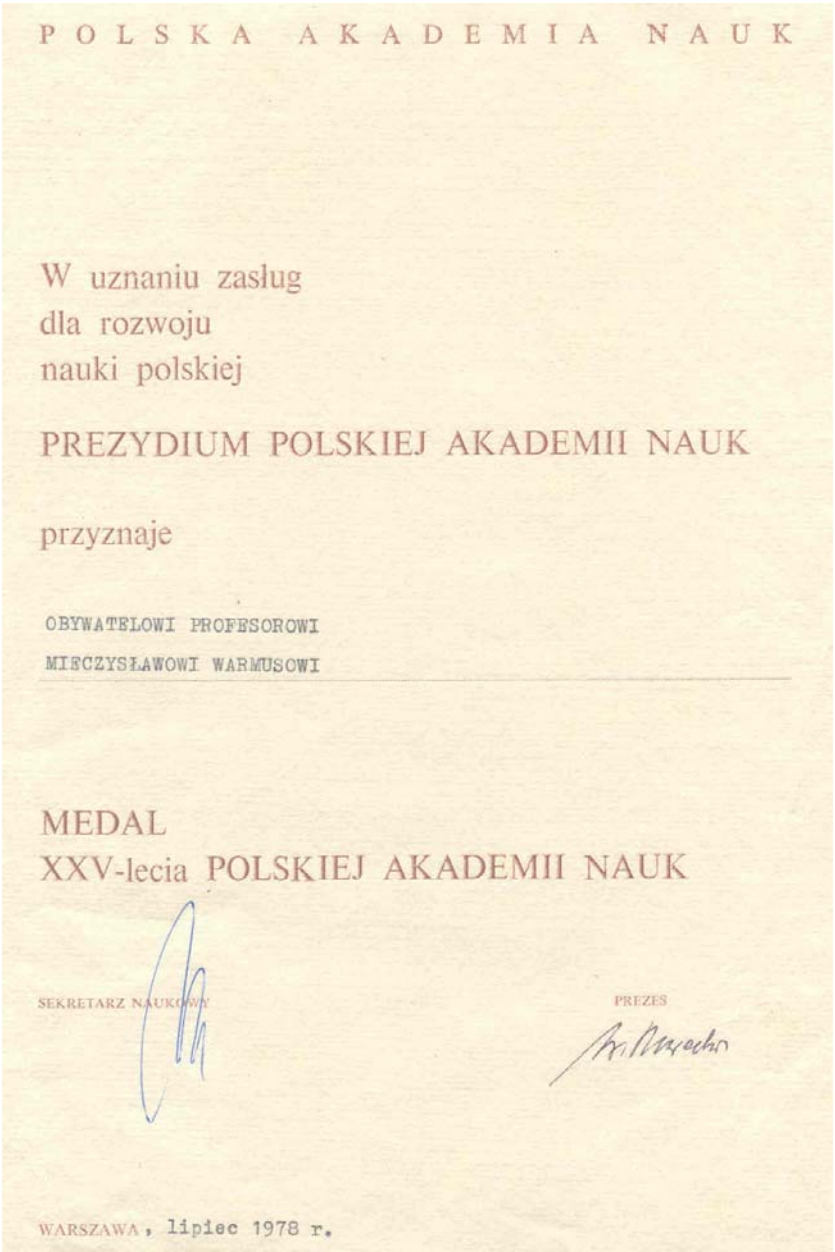
Altogether, Professor Warmus co-authored 37 research papers in the area of application of mathematics in medical science, published in the years 1971 - 1984 [items 64-66, 72, 74-90, 92, 93, 95-108]. They were published in the Polish professional journals such as: *Polskie Archiwum Medycyny Wewnętrznej (Polish Archives of Internal Medicine), Materia Medica Polonia, Polish Medical Journal, and Listy Biometryczne (Biometric Letters)* as well as by international publishers such *as Elsevier Publishing Company*, Amsterdam, and *MEDINFO*, North Holland Publishing Company. The papers were presented at seventeen congresses, symposia and conferences, including eight international ones like:

- X International Congress of Gastroenterology, Budapest 1977;
- International Symposium on Medical Information System MEDIS '78, Osaka 1978;
- VIII World Congress of Cardiology, Tokyo 1978;
- International Conference: Chemical Carcinogenesis and Mutagenesis - Relationships and Practical Aspects, Warszawa 1980;
- IV World Congress on Medical Informatics MEDINFO 83, Amsterdam 1983;
- European Symposium on Biostatistics, Berlin 1984;

Professor Warmus was elected to the eminent position of the Vice-President of the Polish Biometric Society (Polskie Stowarzyszenie Biometryczne) and took active part in organizing the Symposia of Medical Cybernetics Section of the Polish

Association of Internal Medicine (Sympozja Sekcji Cybernetyki Medycznej Towarzystwa Internistów Polskich).

In 1977, the Computation Centre of PAN changed its name to the Institute of Computer Science of PAN (IPI PAN – Instytut Podstaw Informatyki PAN).
In 1978, in recognition of his contribution to the development of Polish science, Professor Warmus received a Commemorative Medal on the 25th anniversary of the Polish Academy of Sciences.



POLSKA AKADEMIA NAUK

W uznaniu zasług
dla rozwoju
nauki polskiej

PREZYDIUM POLSKIEJ AKADEMII NAUK

przyznaje

OBYWATELOWI PROFESOROWI
MIECZYSŁAWOWI WARMUSOWI

MEDAL
XXV-lecia POLSKIEJ AKADEMII NAUK

SEKRETARZ NAUKOWY

PREZES

WARSZAWA, lipiec 1978 r.

Medal Award

Professor Warmus's research interests at that time were not limited to the applications of mathematics in medicine.
During that period, as a sole author he published ten other papers, which ranged widely from algebra and statistics to probabilistic theories, geometry and mathematical modeling [items 62-63, 67-71, 73, 91, 94].
He participated in the so-called Summer School of Mathematicians of the Council for Mutual Economic Assistance (COMECON). Since the beginning of the sixties such meetings of mathematicians from the communist countries were organized for the purpose of exchange of ideas and experiences.

The seventies of the last century constitute an entirely separate period in the history of Poland. After December of 1970, the change of communist leaders brought about long-awaited transformation. It resulted in rapid development of the national economy and new industry investments. New contacts with the western world became common and involved trade, scientific and technological cooperation. There were considerable gains and significant improvements in the supply of consumer goods on the market.
However, this situation did not last long. As early as 1975, first cracks in the national economy began to appear. They were brought about by the necessity to repay the short-term loans taken by the communist government to finance the change. The introduction of the new administrative structure of the country into smaller regions was also very costly. New Polish economic problems were reflected in the marked decline in the supply of basic consumer goods, particularly food.

The increasing social discontent was further fuelled in February 1976 when the Parliament (Sejm) of communist Poland passed two amendments to the Polish Constitution:one affirming the political supremacy of the PZPR party and the other - committing Poland to the irrevocable and loyal alliance with the Soviet Union.

A considerable hike in prices of basic foodstuffs in June of 1976 just tipped the scales of social patience of the nation. Workers' strikes and protests broke out. Striking workers were described by the communist apparatchiks as 'hooligans and louts'. The protests were quelled by the infamous ZOMO troops (Mechanized Brigades of the Peoples' Militia). That paramilitary communist formation disgraced itself even further by their involvement in demonstrators' beatings in Radom, which were then cynically called by the communists as "suspects' health runs". All these events further fuelled the prevailing atmosphere of social discontent and irritation.
August of that year saw the introduction of sugar rationing, soon followed by the rationing of many basic foodstuffs.
Many underground and anti-communist organizations, such as the Committee for the Defense of Workers (KOR) and the Movement for the Protection of Human Rights (ROPCiO), emerged during that time, followed in 1978 by the creation of the Foundation Committee of the Maritime Free Trade Union.

These events were only the first harbingers of the wider wave of social discontent and led directly to the momentous events of 1980, which culminated in the establishment of The Independent Self Governing Trades Union "Solidarity" ("Solidarność").

The above events and the ensuing climate of social tensions were not conducive to the development of the country. The difficulties experienced by people in securing basic necessities for their day-to-day existence became a permanent feature of everyday life in Poland. Further limitations of civic freedoms, demonstrated by the increasing role of censorship of the public media and cultural activities, and elimination of freedom of expression, followed the events of 1976. However, individual contacts with the outside world, particularly with the democratic West, were on the rise. More and more Poles availed themselves of opportunities to travel to the capitalist West. Those peregrinations strengthened an existing awareness among Poles that there were countries practicing true democracy, where people lived ordinary, peaceful lives and were able to support their families with their income. Citizens of those countries did not know the concept of interminable queues for basic necessities of life.
This awareness and desire for a better life prompted many Poles, in the second half of the seventies, to begin emigrating to the West. This phenomenon soon assumed mass proportions, reaching its peak in the years 1980-1981. Migration attracted mostly young, well-educated, post-war generation deeply disenchanted with life in their country and all unrealized prospects and unfulfilled promises of the communist system.

At the end of the seventies the children of Helena and Mieczysław Warmus were grown up individuals. The elder daughter Teresa, a graduate from the Faculty of Mathematics and Physics at University of Warsaw (with major in Numerical Methods), worked at Mera-System. Her younger sister, Bożena, graduated from the Faculty of Polish Studies at the same University (with major in Polish Philology), secured a teaching position at a high school (L Liceum Ogólnokształcące) Warsaw. Their son Tomasz was a student at the Faculty of Foreign Trade of the Academy of Planning and Statistics in Warsaw.

Teresa, being the eldest of the children, having gone through most of the Polish political crises came to a belief that the next time the revolt of the nation would be brutally suppressed with direct help from the Soviet "friends". Together with her husband, Tomasz Simiński, the family decided to emigrate. In May of 1981, with their young sons Michał and Piotr, they left Poland.
After two months of waiting in Austria for their migration application to be processed, they were accepted by Australia as refugees. Tomasz, the son of Helena and Mieczysław Warmus, soon followed in the footsteps of his older sister.

In 1981, the political situation in Poland further deteriorated. The struggle of governing communists against the nation to retain political power and protect the communist system culminated with the declaration of martial law on the13th of December of that year. At the time, it seemed that any hope for a quick political change in Poland had to be abandoned…

From the very beginning of the "Solidarity" in 1980, Professor Warmus, then a researcher at the Polish Academy of Sciences, his wife Helena, a Russian language teacher at the Faculty of Foreign Trade in the Academy of Planning and Statistics, together with the majority of Polish intelligentsia, joined the Movement (NSZZ "Solidarność). They were soon followed by their daughter Bożena, a high school teacher. This fact, and the illegal emigration of their children, Teresa and Tomasz, was another big "blot" in the family dossier in the files of the communist secret police.

The suspension of the martial law on the 31st of December 1982 could not be treated as a proof that political situation in Poland had stabilized. The situation continued to be very tense and nothing seemed to indicate that the conflict between the nation and the communist rulers of the country could be peacefully resolved.

When at the beginning of 1984 the visits by the agents of the secret police in the home of Mr. and Mrs. Warmus became more frequent, and the Polish Academy of Sciences began the process of dismantling the Section of Mathematical Methods under the leadership of Professor Warmus, they both decided to leave Poland. After being granted a year's unpaid leave from the Institute of Computer Science PAN, Professor Warmus and his wife Helena left Poland for Australia at the invitation of their elder daughter. Soon after arriving in Australia, Professor Warmus's employment contract with the Institute was terminated at his request.
At the same time, their younger daughter Bożena, together with her husband Janusz Stachurski and little son Rafał, also decided to emigrate. After some months, Helena and Mieczysław Warmus were reunited with their three children and their families on the welcoming Australian soil.

New Chapter
Australia 1985 - 2003

Helena and Mieczysław Warmus arrived in Australia on the 24th of June 1985. They had left Poland with a firm conviction that they would never go back to live there again.

Only someone who experienced similar emotions can fully understand another human being who makes a conscious decision to leave the native land to which he devoted the best years of his life.

In Professor Warmus's case it was a particularly traumatic experience. His whole professional academic life was based on a continuous struggle with difficulties mounted against him by the communist regime. In his recollections in 1985 the Professor wrote:

"...I decided to remain in Poland for as long as possible, as it was my homeland, the country of my birth, however brutally suppressed by the Russian might. For me it has always been a desperate struggle for existence. I had to work much harder than those in similar positions who joined the Party. My aim was to become the only recognized specialist in a rare discipline. I thought that in that way I would become indispensable and, consequently, would be protected from persecutions. I was proven so wrong. I had always been the subject of suspicion and persecution, despite years of hard work overcoming obstacles put in my way by the Party, and despite becoming an expert and a Director of an institute at the Polish Academy of Science. The Party has never tolerated openly practicing Catholics in the higher echelons of the state bureaucracy; they have always been treated as declared anti-communists. I was perceived as an eminent expert in my field but also as an enemy of the Party..."

These very bitter words may certainly be taken to constitute the public accusation of Poland's political system at the time, which forced so many thousands of Poles to seek abroad those values, for which they had so unsuccessfully struggled throughout their entire lives of hard work under the control of the communist regime.
The loss of human potential suffered by Poland due to this mass exodus in the first half of the eighties of the 20th century cannot be overestimated.

In Australia, Professor Warmus and his wife Helena settled in the city of Wollongong to join their elder daughter Teresa, who had lived there with her family since 1981. Wollongong, a city of some 260 000 inhabitants, is the third largest metropolitan area in the State of New South Wales.

It is situated about 80 kilometers south of Sydney and is the heart of the Illawarra region, known for it's pleasant, semi-tropical climate, beautiful beaches and varied flora. Picturesquely situated on the shores of the Pacific Ocean, it embraces the salty Lake Illawarra. From the rest of Australia it is separated by mountain ranges, which create a natural barrier against dry Australian winds. The city, connected to Sydney by a freeway and an electric train, offers all the metropolitan amenities while retaining its pleasant atmosphere of a tourist centre.

29. Professor Warmus with his wife Helena, son Tom and grandchildren: Peter and Anna, Tom's daughter; Sydney 1985

At the time of the Warmuses' arrival, Wollongong was also a thriving industrial and academic centre. The University of Wollongong had some 13 thousand students and employed 1500 academic staff. It was considered one of the best academic centers in Australia. Such areas of study as computer science, mathematics and telecommunications earned national recognition.

The exceptional beauty of the city, its location as well as the closeness of their children had tremendously positive influence on the well being of Helena and Mieczysław Warmus and eased the process of assimilation in the new environment.

30. Mieczysław Warmus with his wife Helena and grandson Rafał, Wollongong 1985

They came to like Wollongong and its environs as well as the clean Australian air and agreeable climate. They were very happy to be able to see very often their younger daughter Bożena and their son Tomasz who, together with their families, settled in Sydney.

In the second half of 1985, Helena Warmus began learning English and Professor Warmus got in touch with the Faculty of Mathematics of the University of Wollongong.
He received assurances that he would be employed as a Visiting Professor in the following academic year, which in Australia begins in February.

As arranged, in February 1986 Professor Mieczysław Jan Warmus (known to his Australian colleagues as John Warmus) joined the academic staff at the Faculty of Mathematics, University of Wollongong.

Due to his age and the Australian retirement regulations restricting salaries of people over 65 years of age, his financial rewards were rather of a symbolic nature and seen as an honorary remuneration. However, his status of Visiting Professor gave him all the privileges of a university researcher, including access to an office equipped with the latest computer and printer as well as other necessary facilities.

Professor Warmus conducted lectures in Distribution Theory for postgraduate students, took part in scientific seminars and in examinations. His employment contract was subject for renewal at the beginning of each academic year.

Professor Warmus's university employment created favorable environment for the continuation of his own research. To further facilitate his research work, the University agreed to equip his home study with a personal computer and a printer. He was very appreciative of this initiative. In his letters to friends he frequently emphasized, with his characteristic sense of humor, the technological advantages of his electronically enhanced home office:

"…*As you can see I am writing this missive on a computer, which was given to me by the University to work at home. It only takes half of my desk but is extremely powerful; it can remember as many as 150 typewritten pages together with drawings and graphs. One can change these pages automatically to all imaginable configurations. Pasting into the existing text of extra paragraphs is a trifle.*
The changes in paragraphs and pages, together with re-numbering process, happen in a flash. Besides this, the computer also has substantial calculation capabilities…

…It is important that on my computer I can write letters at a much faster pace than with handwriting and consequently I can write more. Besides, from the point of view of brotherly love for my fellow human beings, now I do not put my friends to the hard task of deciphering my illegible scrawls. For the same reason I do not have to print-write my letters in small writing.

Thus the fun I am having here with writing letters on the computer produces additional benefits for you, my friends…"
"A letter to Juventusiaks of Warsaw", Wollongong, April 3, 1987

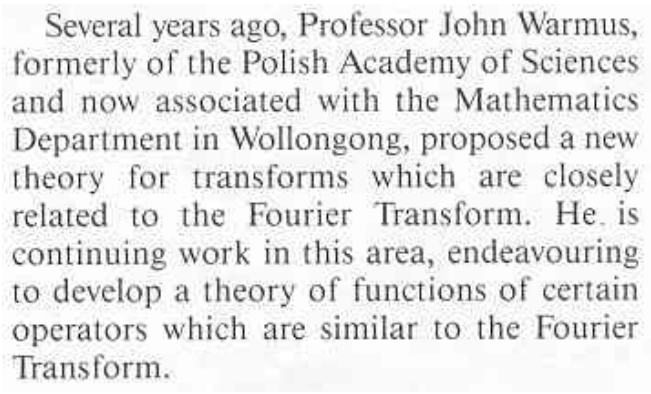
Professor Warmus's knowledge and research achievements won him both the recognition and esteem among his professional university colleagues. He was often consulted in solving some more intractable scientific dilemmas.

In April 1987, *The University of Wollongong Gazette* Vol. 5 No. 1 published an article entitled *"Transform Theory a unifying theme in mathematics research"*. The very title seemed to suggest that mathematical theories were often a common research focus for mathematics researchers.
The photograph below shows a smiling Professor Warmus in a relaxed atmosphere, surrounded by other researchers from the Faculty of Mathematics of the University of Wollongong, all engaged in a discussion on that interesting topic known as *Fourier analysis.*

Department of Mathematics researchers working on the Fourier transform theory are, from left, Dr Shahab Ghahreman, Dr Rod Nillson, Dr Noel Smyth, Professor John Warmus and Ms Annette Worthy

Document 40. Professor Warmus with colleagues from the Faculty of Mathematics.

The text that follows, further explains that some years earlier, when Professor Warmus was still working as a researcher at the Polish Academy of Sciences in Warsaw, he had come up with a new theory in that area, which became the subject of discussion, depicted by the photograph.



Several years ago, Professor John Warmus, formerly of the Polish Academy of Sciences and now associated with the Mathematics Department in Wollongong, proposed a new theory for transforms which are closely related to the Fourier Transform. He is continuing work in this area, endeavouring to develop a theory of functions of certain operators which are similar to the Fourier Transform.

Document 41.

In his lectures, and papers delivered at seminars, Mieczysław Warmus often reminisced about the beginning of his research work at the Faculty of Mathematics, Wrocław University . It was with considerable fondness that he remembered the so-called 'Wrocław School of Mathematics', which was in the forefront of European mathematical thought of the times. He considered the system of seminars for the resident researchers and academics, as well as for students, to be exceptionally good and worthy of replicating. However, it was with bitterness that he remembered the Warsaw period of his career.

In the last 20 years of his academic work in Poland, Professor Warmus focused his research interests on the application of mathematics into medical science. Emigration to Australia brought about a temporary halt in his research activities in this area but Professor Warmus revived his interest at the end of the eighties and initiated contacts with those Australian medical scientists who were interested in the field.

In his new surroundings, Professor Warmus found encouragement to intensify work on his research endeavors. As early as 1986, the University press preprinted his work "*Normal" Regression. A New Approach to Regression* [item 114].

In February 1987, Professor Warmus presented a paper, in which he proposed his own theory of operational calculus. The paper entitled *A Generalized Theory of Operational Calculus* was delivered at a scientific seminar organized by the University.

THE UNIVERSITY OF WOLLONGONG

DEPARTMENT OF MATHEMATICS

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SEMINAR NOTICE

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SPEAKER: Professor John Warmus,
Visiting Professor,
Department of Mathematics.

DATE: Thursday, 2nd April, 1987

PLACE: Room 15.204 (Austin Keane Building)

TIME: 1.30 pm - 2.30 pm

TITLE: A generalized theory of Operational Calculus

ABSTRACT: *In 1971, I published a paper suggesting a new theory of Operational Calculus, including the theory of Laplace-Carson Transformation (or Laplace transformation) and also, in the sense of an isomorphism, the theory of Mikusinski.*

Since I felt that my theory is not an optimal one, I tried many times to improve it, but without success. Just recently, in Australia, I succeeded in obtaining such a new optimal theory. It has yielded many new unexpected theorems, and new simpler proofs of some old ones. Some other existing theories of generalised functions may now be included in this latest theory.

We regret that a fee of $1.00 may be imposed for parking on campus.

Document 42. Seminar notice

1987 also saw the preprinting of Professor Warmus's work under the same title [item 115]. Two more works appeared in the form of preprints in 1988: *Introduction to m-dimensional Analytic Geometry* [item 117] and *Geometry of Matrices Part 1* [item 116]. Two further parts of the latter monograph were in the process of preparation for publication.

The lifestyle of the Warmus family in Australia differed considerably from the one they had been used to in the old country.

In his letters to friends Professor Warmus quite often made comments about those differences.

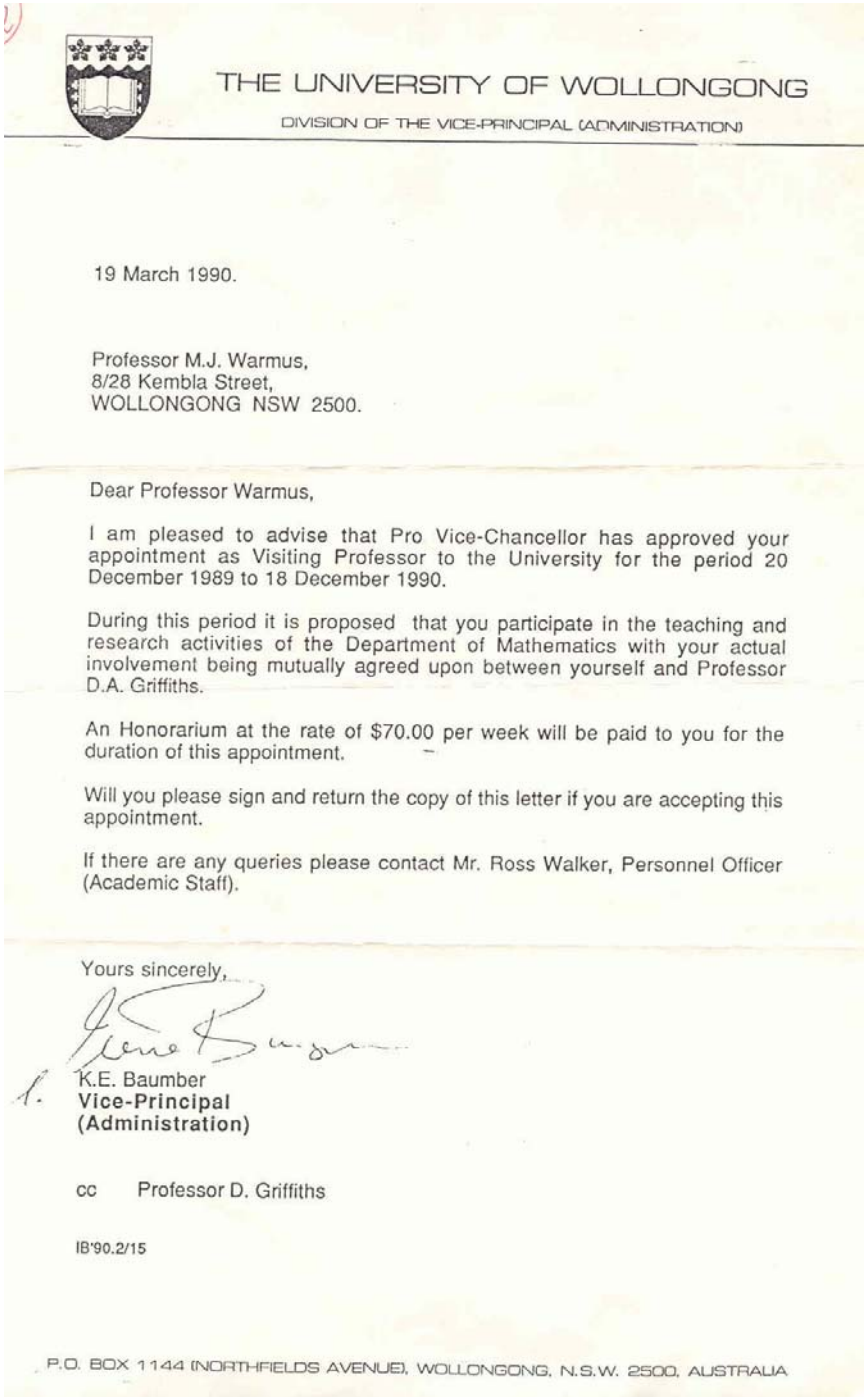
He and his wife Helena were busy with their family and happy to have everyone so closely around. They very actively contributed to the good works of the catholic group in their parish of the Wollongong Cathedral. They organized meetings for the catholic academic youth in their apartment thus returning, in their new country, to the tradition of the "Iuventus movement". Professor Warmus was very active at the University Catholic Society in Wollongong. In 1987, R.A. Joseph, a doctoral student at the Department of Sciences and Technology of the University of Wollongong, in the introduction to his doctoral dissertation entitled *Symbolic Politics in The High Technology Debate in Australia* included special vote of thanks to Helena and John Warmus for their unwavering emotional and religious support during the difficult period of his work on the thesis.
Another example of Prof. Warmus's altruistic and truly Christian principles was his and his wife's active involvement in the welfare campaign for Alicja Zienkiewicz, an employee of the Polish Academy of Sciences. The campaign was organized by Professor Andrzej Blikle, also an employee of PAN, with an aim of collecting funds for the purchase of a wheelchair for Ms Zienkiewicz.

The years of 1988 and 1989 Professor Warmus devoted almost exclusively to the writing of his extensive, three-volume monograph entitled *Geometry of Matrices*, which proposed an entirely new mathematical concept. Volume 1 appeared as a preprint at the beginning of 1988 and Volume 2 was in its finishing stages.

On the 19th of February 1990, Professor Mieczysław Jan Warmus suffered massive brain hemorrhage, which resulted in total paralysis of the right side of his body. His right hand, which used to put his thoughts and new mathematical formulas on paper, was now useless. Moreover, his speech was severely affected and he was not able to communicate verbally. The manuscript of the second volume of *Geometry of Matrices* ended abruptly on page 207. His author would never be able to return to it…
Professor Warmus's sudden illness was a terrible blow for the whole family. It was also a shock to his many friends, colleagues and co-researchers from the University of Wollongong.

In March, the University contract for the extension of his employment at the Faculty of Mathematics for the coming academic year arrived by post. It was delayed by the holiday break.

After five months in a rehabilitation hospital, Mieczysław Warmus returned home. Due to his movement impairment he has been confined to a wheelchair since 1990.



THE UNIVERSITY OF WOLLONGONG

DIVISION OF THE VICE-PRINCIPAL (ADMINISTRATION)

19 March 1990.

Professor M.J. Warmus,
8/28 Kembla Street,
WOLLONGONG NSW 2500.

Dear Professor Warmus,

I am pleased to advise that Pro Vice-Chancellor has approved your appointment as Visiting Professor to the University for the period 20 December 1989 to 18 December 1990.

During this period it is proposed that you participate in the teaching and research activities of the Department of Mathematics with your actual involvement being mutually agreed upon between yourself and Professor D.A. Griffiths.

An Honorarium at the rate of $70.00 per week will be paid to you for the duration of this appointment.

Will you please sign and return the copy of this letter if you are accepting this appointment.

If there are any queries please contact Mr. Ross Walker, Personnel Officer (Academic Staff).

Yours sincerely,

K.E. Baumber
Vice-Principal
(Administration)

cc Professor D. Griffiths

IB'90.2/15

P.O. BOX 1144 (NORTHFIELDS AVENUE), WOLLONGONG, N.S.W. 2500, AUSTRALIA

Document 43. Letter of Appointment from the University's Vice-Principal.

During this tragic period in the life of Professor Warmus and his closest family, their home country on the other side of the world was undergoing an important historical transformation.

In April 1989, in important talks between the communist government and illegal opposition, (the so-called "Round Table Talks") an agreement was reached as to the second formal recognition of The Independent Self-Governing Trades Union "Solidarity" (NSZZ "Solidarność").

It was also agreed that in the next general election, one third of membership of the Lower House of the Parliament and full membership of the Upper House, the newly created Senate, would be elected in truly free general election. As a result of this agreement, in the general election in June 1989, the governing party (PZPR) suffered total defeat. On the 31st of December 1989 Polish Peoples' Republic ceased to exist and the Third Republic of Poland was born. In January of 1990, the last General Assembly of the governing Polish United Worker's Party (PZPR) declared the dissolution of the party. A new era in the history of Poland began.

In 1998, Helena and Mieczysław Warmus were invited by their son Tomasz, who lived in Poland since 1992, to visit their homeland.

It was their first visit together after a fourteen-year absence. For Professor Warmus the trip back was a constant source of delight. It was an opportunity to meet a large group of his friends and visit places such as Zakopane, Zawoja and Jurata, which revived many fond memories for them both. Professor Warmus well remembered the familiar places in Warsaw, such as Książęca Street and Plac Trzech Krzyży, where he fought during the Warsaw Uprising.

31. Professor Warmus with his wife Helena, Wollongong, 2002

He was particularly moved when he saw the house in which he had lived with his family for more than twenty six years, and which they had to abandon fourteen years earlier when leaving Poland for good. He was equally moved when he saw Batory College, which he had attended before the war. After their six-week stay in Poland they returned to Australia, their new home.

Despite the fact that limited ability to move around, and inability to communicate by speech or writing, forced Professor Warmus to change the lifestyle to which he was accustomed, he is still in good spirits and his face often lights up with his characteristic kind smile.

He happily participates in church services and family occasions and enjoys specially organized car excursions.

32. Professor Warmus surrounded by his family, Wollongong, 2002

Seeing the serene expression with which he accepts his disability one is reminded of the words from a letter he had written to his friends:

"…Our suffering is the only gift we can offer God and which is truly our own…"

("A letter to Juventusiaks of Warsaw". Wollongong, 14th of April 1987)

33. At Michael's wedding, April 2000; Top row from the left: Tomasz Warmus, Alexandra (his step daughter), wife Anna, Leisa and Michael Siminski, Ania (Tom's daughter), Bozena Beagley, Marek and Bogda Kowalski and Teresa Siminska; Bottom row from the left: Alexander (Bozena's son), Jan (Tom's son), Mieczysław and Helena Warmus and Lisa Rybak, (Helena's sister).

34. In the centre: Professor Mieczysław Jan Warmus with his wife Helena surrounded by their family. From the left: their daughters, Bożena Beagley with husband Peter and son Alexander and Teresa Simińska with husband Tomasz; On the right: son Tomasz Jan Warmus with his wife Anna and their son, named Jan, according to family tradition. Wollongong 2003

Professor, director and a colleague

During 44 years of his academic career, Mieczysław Warmus was a professional colleague, teacher and supervisor of many people. His outstanding personality influenced many in their choice of professional career paths. Józef Łukaszewicz, at present a retired professor of mathematics at the Wrocław University , is just one of many such examples. This is what he wrote in his memoirs:

Józef Łukaszewicz
Professor of Mathematics (Professor Emeritus)
Wrocław University

Mieczysław Warmus - my colleague and friend
(Version 2 - excerpts)

One day, and it must have been at the end of August, or beginning of September 1946, in the hallway of the main building of the Wrocław Polytechnic, I saw two people struggling with an enormous library bookcase. I hastened to render assistance and together we managed to put it into Room 128. This was the first time I entered the premises of Mathematical Seminar of the University and Polytechnic of Wrocław (then one tertiary institution). After the finished job I introduced myself to the porters and, in the course of the conversation, I learned that the older of the two was Henryk Majko - a caretaker in the Mathematical Seminar, who before the war worked in the same capacity at the University of Warsaw. The other man, Mieczysław Warmus, was then a junior assistant in the Mathematical Seminar and, at the same time, was finishing his external course sitting exams required to get his MA in Mathematical Sciences. We sat down for a moment and engaged in a conversation, which was of paramount importance to me.

It is now time to explain the reason for my presence in the main building of the Polytechnic. After numerous war vicissitudes, in January 1946 I returned to Poland from the former Polish territories beyond the River Bug and immediately began to make up for what I missed out on educationally during the German occupation I enrolled into a preparatory course at the Copernicus University in Toruń. In July of the same year, having successfully passed the final examinations, I received a Course Certificate entitling me to enroll as a first year student at the Toruń University. However, I was determined to study Electrical Engineering. Vice-chancellor of the Toruń University, Professor Władysław Dziewulski, happy to assist me in my endeavors to realize my dream, gave me a letter of recommendation, in which he presented me as a gifted and industrious student and asked that I be admitted to a Polytechnic course for engineers.

The library bookshelf scene occurred at the very moment when, dejected and disappointed, I was walking away from the office of the Dean of the Faculty of Mechanical and Electrical Engineering (then it was Professor Kazimierz Idaszewski) with his negative decision to enroll me into the electrical engineering course at the Polytechnic. He suggested that I should repeat the preparatory enrolment course for those without matriculation certificate. I shared my problem with Mr. Warmus, an assistant at the Polytechnic, who advised me to enroll in a mathematics course at the Faculty of Mathematics, Physics and Chemistry, which at the time was a shared faculty between the University and the Polytechnic in Wrocław. He also told me that he had himself begun tertiary studies at the Warsaw Polytechnic before the war but now was determined to pursue specialization in mathematics. He asked me whether I had ever worked in a factory because he believed that only in direct confrontation with production processes one could determine his technical inclinations. This seriously shook my preference for electrical engineering. His argument that ultimately, after a successful first year of mathematics, there would be no impediment to transferring to a technical course (without loss of another academic year) was convincing. Moreover, if one wanted to study mathematics, there was no better place to do it than in Wrocław, which although still in its organizational stages, successfully integrated the best traditions of the pre-war mathematical schools of Lwów and Warsaw.

Immediately after this conversation I went to the office of the Dean of the Faculty of Mathematics, Physics and Chemistry, Professor Hugo Steinhaus, who enrolled me into the first year intake without much further ado. What I have to confess here is that my mathematical studies engulfed me so completely that I soon abandoned any idea of ever changing my specialization.

Thus my accidental meeting with Professor Warmus became a turning point in my life as well as the beginning of a friendship and fulfilling professional association, which lasted for many years.
During the period of our close association, and later when Professor Warmus moved from Wrocław to Warsaw and then on to Australia, I have always admired the many exceptional talents of my older colleague and friend, in particular his quickness of mind, breadth of professional interests and uncommon diligence.

His list of scientific publications comprises 117 items. It would be very difficult to present them all here. Further in this text I would only discuss some of them, mostly those that I consider either close to my heart or requiring particular emphasis.
One of the first publications of Professor Warmus, which I particularly liked, was a paper published collaboratively with Stefan Drobot entitled: "Dimensional analysis in sampling inspection of merchandise", Dissertationes Mathematicae 5 (Rozprawy Matematyczne 5), Warszawa 1954, p.54. In the same year the authors published a shorter, Polish version of this paper in the journal ***Zastosowania Matematyki***

(Applications of Mathematics). The idea ofDrobot and Warmus presented in the paper was very highly valued by Professor Hugo Steinhaus…

… I would also like to mention here a sizable treatise by Mieczysław Warmus entitled "O obliczaniu pól obszarów płaskich siatkami równoległobocznymi" (On computation of two-dimensional areas with the use of parallelogram nets), ***Prace Wrocławskiego Towarzystwa Naukowego,*** *(The Proceedings of the Wrocław Scientific Society), series B, nr 27, Wrocław 1955, p. 60. It was the text of Mr. Warmus's doctoral dissertation presented by Hugo Steinhaus (who was also the supervisor of Mieczysław Warmus's doctoral studies) on 24 November 1949 at the combined scientific session of the Faculty of Mathematical and Natural Sciences and the Faculty of Medical Sciences of the Wrocław Scientific Society. It may seem strange today that six years had to pass between the presentation of the thesis and its publication. But in those Stalinist times it probably was one of the forms of repression and persecution by the communist regime used against nonconformist individuals such as Mieczysław Warmus. His doctoral degree was conferred on to him by the University and Polytechnic of Wrocław on the 15th of March 1950…*

…A copy of Mieczysław Warmus's thesis, which I found in the library of the Institute of Mathematics of the Wrocław University, came from the collection of our mutual master Professor Hugo Steinhaus, who died in 1972. The cover of it contained a hand-written dedication:

"To the most esteemed Professor Doctor Hugo Steinhaus, my Mentor and Advisor, with my sincere expression of respect and gratitude for teaching me how to love Mathematics, I dedicate this work
Author".

On the 22nd of February 1958, Mieczysław Warmus received his next degree of Doctor of Mathematical Sciences (which corresponds to "habilitation" or associate professorship in today's terms) conferred on him by the Scientific Council of the Institute of Mathematics of the Polish Academy of Sciences. The basis for awarding of this degree was a sizeable thesis entitled "Nomographic Functions". This thesis was published as Volume 16 in the series Dissertationes Mathematicae (Rozprawy Matematyczne), Warsaw 1959, p. 151./

Among the papers made available to me by the family of Mieczysław Warmus,
I found an assessment of M. Warmus's professorial dissertation (praca habilitacyjna) written on the 23rd of October 1957 by Władysław Ślebodziński, the eminent mathematician and Professor of Mathematics at the Polytechnic of Wrocław.
I would like to take the liberty of quoting here excerpts from that assessment and add that I am in full agreement with the reviewer in his very positive appraisal (I

had later the privilege of appraising the results of the author's research for publication purposes):

"…All the scientific propositions in docent Warmus's work were academically rigorous. The considerable calculation complexities, inextricably intertwined with such subjects, have been overcome with a great skill. The work is written with great pedagogical flair. That means that those who are interested in application of mathematics in engineering would find it easy to use. To comprehend the work it would be sufficient enough to have, apart from elementary mathematics, the knowledge of some basic concepts of the theory of matrices and determinants.
On the basis of my analysis of the work presented by docent Warmus, and by comparison with other works on the subject, I can ascertain that it is an independent and an original contribution to science. It is also the first and complete solution to an interesting theoretical problem, which is important from the practical point of view…It must be added that docent Warmus is the first and so far the only Polish mathematician for whom the problems of applied mathematics are the main focus of interest and scientific investigations, and who has significant and important results in this field…"

*A new theory of operational calculus posited by Professor J.G.Mikusiński ("Operational Calculus", **Pergamon Press**, 1959) was an important event in Polish mathematics in the middle of the 20th century. It was constructed without using the traditional transformations of Laplace or Laplace-Carson. Mikusiński spent some time in Wrocław and presented there his new theory even before the above-mentioned monograph appeared in print. Mieczysław Warmus demonstrated his outmost interest in the theory of operational calculus. It was not surprising that Professor Mikusiński asked Mieczysław Warmus to prepare problems and their solutions for the book Professor Mikusiński was getting ready for publication. Later on the publisher asked Mieczysław Warmus to write a pre-publishing assessment of the book. The reviewer discovered then a possibility of a different approach to the subject matter.*

The theory of operational calculus was then central to Mieczysław Warmus's interests. After several years it resulted in a sizeable dissertation entitled "A new theory of Operational Calculus", and which was published in Dissertationes Mathematicae (Rozprawy Matematyczne) LXXX, Warszawa 1971, p.46…

…This subject never lost attraction for Mieczysław Warmus and continued to be of interest to him until the last period of his research activities. Thus, already in Australia, in 1987, the Faculty of Mathematics, University of Wollongong, published a large-size preprint, which proposed further generalization of the theory of operational calculus: Mieczysław J.Warmus "A generalized theory of Operational Calculus", Preprint No. 6/87, p. 133.

Mieczysław Warmus is an author of many books - some of these we wrote collaboratively and it was a great honor and an unforgettable adventure.

In the fifties, Mr. Warmus offered me a chance of collaboration in writing a book called "Numerical and graphic methods". It was published (with an inscription: Part 1) as Volume 12 of the Biblioteka Matematyczna (Mathematical Library) Państwowe Wydawnictwo Naukowe, Warszawa 1956, p.429.
We decided to divide work on the book in the following manner: I undertook to write the chapters devoted to graphic methods, Mr. Warmus, on the other hand, took over the larger part of the book dealing with numerical methods. Together we produced chapter one concerned with the theory of the maximal error. It is worth noting here an interesting theory proposed by Mieczysław Warmus relating to the shortened notation of an approximate number with an absolute error.

...The book was received well by both reviewers and readers…
...Despite the inscription informing readers that it was Volume 1, its continuation never saw the light of day. This inscription appeared at the insistence of the publisher, who wanted us to continue our work in that area, particularly on the subject of numerical methods of solving differential equations. Continuation in any form turned out to be impossible as the collaborators had since moved on to new subjects and duties…

...His last book, published in two versions in Australia in 1988, was the preprint: Mieczysław John Warmus "Geometry of Matrices, Part 1. Introduction to m-dimensional Analytic Geometry", Department of Mathematics, University of Wollongong, Preprint 4/88, p. 198 and preprint 12/88, p.219. The longer version of this preprint (12/88) differed from the previous one in that the author supplemented it with a twenty page-long part entitled: "Introduction to the theory of pseudo-inverse of matrices". The author dedicated both versions of the preprint:
"To Helen, my wife and best friend".

Having known the family of Mieczysław and Helena Warmus for over half a century I know that this dedication was not just a courtesy gesture.
Mrs. Helena Warmus during their entire life together provided solid support for her husband and managed to create a comfortable home, where members of the family could enjoy themselves, find support in difficult moments, relax and, in the case of her husband, find the best atmosphere conducive to productive research work…

...The last group of Mieczysław Warmus's publications, which I wish to discuss here, were mathematical tables. As early as in 1953 he published "O obliczaniu wielocyfrowych tablic logarytmicznych i 36-cyfrowe tablice logarytmów naturalnych" (On the evaluation of the logarithmic tables and tables of natural logarithms up to 36 decimal), Prace Wrocławskiego Towarzystwa Naukowego

(Proceedings of the Wrocław Scientific Society), Seria B, Nr 51, Wrocław 1953, p. 84. This publication consisted of two parts; there was a 24 page-long text entitled "O obliczaniu wielocyfrowych tablic logarytmicznych" (On the evaluation of the logarithmic tables) and a separate publication bound in hard cover entitled "36-cyfrowe tablice logarytmów naturalnych" (Natural logarithms up to 36 decimal), [p.64]. In the following year, the same series B brought the French translation of this work (together with explanations in Russian) as item no 52 in the series….

Lastly, I would like to mention that I also shared Mieczysław Warmus's religious beliefs and commitment. Even during our first conversation, which I mentioned in the opening remarks of this essay, I informed him that I had come to Wrocław directly after the end of the summer camp organized by "Iuventus Christiana" in Krościenko on the Dunajec River. I was very surprised and truly overjoyed to hear that my new acquaintance had been a member of this academic Catholic organization before the war. Later we founded together the Wrocław Chapter of "Iuventus Christiana". For about three years we were very active in this organization until the communist security police began taking a serious interest in our group and until all Catholic organizations were forced to cease their activities in communist-ruled Poland. Until this very day I am deeply indebted to Mietek (Mieczysław) as it was under his guidance and by his example that I was fortunate enough to enrich my worldview in the spirit of "Iuventus Christiana".

Once again, we appeared together in the public arena as founding members of the Catholic Intelligentsia Club in Wrocław. The year was 1957 and it was soon after the memorable" October", when a short-lived period of political "thaw" made it possible to establish Catholic social clubs in several Polish cities.

It was a matter of considerable regret for me to have lost this closeness with Mietek after his move to Warsaw. Today, when we inhabit the antipodes of this globe (I in Poland, and he in Australia), in a situation when Mietek became the prisoner of his wheelchair and his contacts with the outside world are unfortunately rather limited, what is left are the heart-warming memories, togetherness in prayer and a profound belief and hope for a future happy reunion in the House of the Heavenly Father.

From the depth of my heart I would like to thank Mietek and his entire family for their unwavering friendship and all the goodness that was bestowed upon me in the course of all those years of our association.

Wrocław, 9th of November 2002

The beginnings of the professional career of Professor Stefan Paszkowski, a researcher at the Institute of Low Temperatures and Structural Studies of PAN in Wrocław, bear some resemblance to the beginnings of the academic career of Mieczysław Warmus.

Just as in the case of Professor Warmus, who, as a young man driven by his mathematical interests found his way to Wrocław and was "recognized" by Professor Hugo Steinhaus, his teacher and mentor at the incipient stages of Warmus's academic career, young Stefan Paszkowski's mathematical talents were similarly "recognized" by Mieczysław Warmus. How it affected his future professional career is the subject of his memoirs.

Professor Stefan Paszkowski
Institute of Low Temperatures
and Structural Studies PAN
Wrocław, May 2003

A recollection

I met Professor Mieczysław Warmus in the spring of 1953. Without the slightest exaggeration one can say that this event determined my later professional life and much besides.

At the time, I happened to be a second year student of mathematics at the University of Łódź. Since the very beginning of my academic studies I was interested in numerical methods or, in present day terminology, numerical analysis. The available literature on the subject was scant and none of the lecturers took any interest in it. I was blindly searching for some contacts outside Łódź (Professor Hausbrandt - a geodesist, Professor Banachiewicz - an astronomer and the inventor of the so-called 'cracoviana') but my search failed to produce any results. Professor Charzyński, another mathematician from Łódź, tried to interest me in his area of research - analytical functions. When he realized that he was not getting anywhere with me, he gave me a letter of recommendation to Professor Warmus, his colleague in Wrocław, the only researcher known to him who was interested in numerical analysis.
Equipped with the letter and some manuscripts of my first papers I left for Wrocław in the spring of 1953. I was paralyzed with stage fright. Despite the fact that Professor Warmus had never heard of me, he offered a very warm reception and devoted several hours of his precious time to talk to me and peruse those rough manuscripts of mine. He was immediately able to establish that my knowledge of numerical methods was embarrassingly scant. For instance, I "discovered" a special case of the classical Newtonian method and I proposed some "methods", which did not even deserve to be called so.

After he had clarified all these problems to me, Professor Warmus not only encouraged me to continue my work in that area but also, to my complete surprise, suggested that I should transfer to the Wrocław University . He promised that he would try to make arrangements to have me employed at the Institute of Mathematics of the Wrocław Polytechnic, where he himself worked.
I was only a student then, and just eighteen, so I am certain that it was not easy for Professor Warmus to convince the Rector of the Polytechnic to give me a job even though, initially, it was at the most humble and lowly level of junior assistant.

I am still in possession of two letters written to me by Professor Warmus, which demonstrate how warmly and cordially the Professor treated me, and how much of his time he devoted to assist me in concluding the necessary formalities and smoothing the initial stages of my studies and work in Wrocław.

Wrocław, dnia 11 czerwca 1953 r.

WP Stefan Paszkowski
Ł ó d ź
ul.Srebrzyńska 83 m.42.

Szanowny Panie !

Nie odpisywałem dość długo, ale po pierwsze nie było nic pilnego, po drugie słyszałem o Pańskiej chorobie, a po trzecie byłem tak przytłoczony pracą, że trudno było znaleźć wolną chwilę na pisanie.

Sprawa Pańska stoi na jaknajlepszej drodze. Rektor Uniwersytetu Wrocławskiego, z którym rozmawiałem w wyraził zgodę na przeniesienie Pana z Uniwersytetu Łódzkiego do Wrocławskiego. Formalności załatwia się po wakacjach, będzie je Pan mógł za moim pośrednictwem przeprowadzić nawet bez specjalnego przyjazdu do Wrocławia. Dam Panu znać, gdy nadejdzie pora ich załatwiania.

Sprawa Pańskiej asystentury na Politechnice przedstawia się również pomyślnie. Zarówno kierownik katedry prof. Ślebodziński jak i Rektor Politechniki wyrazili swą zgodę na powierzenie Panu stanowiska zastępcy asystenta mimo tego, że studiuje Pan dopiero na II roku. Byłby Pan asystentem u mnie, przez pierwszy semestr miałby Pan [redacted] 8 godz. tygodniowo ćwiczeń, lecz są poważne możliwości przeniesienia Pana całkowicie z pracy dydaktycznej na naukową, gdyby pierwszy semestr dał do tego wystarczającą podstawę. Pobory zastępcy asystenta wynoszą miesięcznie brutto 634 zł, a po odliczeniu potrąceń 616,90 zł. Nie jest to dużo, ale byłyby możliwości dorobienia sobie więcej; najlepiej przez publikacje naukowe, które są dobrze płatne (do 1800 zł za 16 stronicowy arkusz druku), a jestem przekonany, że miałby je Pan napewno ; przez zajęcia zlecone, przez artykuły do czasopism i t.p. Pozostają ponadto różne możliwości stypendialne.

Mieszkanie w domu akademickim mam dla Pana obiecane. Myślę, że sprawa mieszkaniowa nie powinna tu stanąć na przeszkodzie.

Narazie prosiłbym Pana o przesłanie na moje ręce następujących dokumentów:

1. Życiorys pisany odręcznie w 3 egz., w którym m.in. musi Pan podać wykaz zdanych egzaminów,
2. Oświadczenie, że zgadza się Pan na objęcie stanowiska zastępcy asystenta przy Zespołowej Katedrze Matematyki na Politechnice Wrocławskiej od dnia 1.9.1953. (w 2 egz.)
3. Opinie Pańskich profesorów (ja swej strony dołączę we Wrocławiu swoją) .

Radzę Panu przed wysłaniem tych dokumentów zrobić z nich odpisy, gdyż nie jest wykluczone, że na jesieni znowu będzie Pan musiał te same rzeczy składać.

W sprawach matematycznych napiszę do Pana za jakieś 10 dni. Będę wtedy nieco wolniejszy, a miałbym ochotę obszerniej te rzeczy omówić.

Mieczysław Warmus

Wrocław 5, ul.Stalinogrodzka 58m.1.

Document 44.
Mieczysław Warmus's letter to
Mr. Stefan Paszkowski

(Translation of the above letter follows:)

Wrocław, 11th of June 1953

Stefan Paszkowski, Esq.
Łódź
Srebrzyńska Street, 83/42

Dear Sir!

I was rather tardy in my reply but, firstly, there was nothing of any urgency; secondly, because I heard about your illness; and thirdly, I was so flat out with my work that it was extremely difficult to find a spare moment for writing.
However, your affairs here are progressing well. I had spoken to the Rector of the Wrocław University and he agreed to your transfer from the University of Łódź to this University. The formalities are normally attended to after the holiday period, and you will be able to finalize them through me without even having to put a special appearance here. I will let you know when the time comes to finalize those formalities.

The business of your employment as an assistant at the Polytechnic is also looking good. Head of the Faculty, Professor Ślebodziński, as well as the Rector of the Polytechnic, both agreed to offer you the position of junior assistant despite the fact that you are still in your second year of studies. You would be my assistant and for the first semester; your teaching load would be eight hours of tutorials per week. However, there is strong probability that you will be moved from teaching to research work, if the first semester produces a sound basis for such move. The salary of a junior assistant amount to 634 zloty gross and after deductions it will be 616.90 zloty. While it is not much, there are opportunities to add to that; the best way would be through scientific publications, which are well remunerated (up to 1800 zloty for a printed sheet of 16 pages) and I am convinced that you would have plenty of such opportunities. You can also augment your income through various commissioned jobs, contributions to periodicals, etc. Furthermore, there are also some scholarship opportunities.I have also been promised some student accommodation for you. Hence, accommodation should not be an obstacle.

At this stage I would only ask you to supply me with the following documents:

1. *Your handwritten Curriculum Vitae in three copies, which must include all the examinations taken and passed;*
2. *Your statement to the effect that you agree to accept the position of junior assistant at the Combined Faculty of Mathematics at the Polytechnic of Wrocław, beginning from 1st September 1953 (two copies) and*
3. *References from your professors (I will also append my reference in Wrocław).*

I would like to advise you to make and keep copies of all these documents, as we cannot exclude the possibility that in autumn you will have to supply the same papers again.
On mathematical issues, I will write to you separately in ten days or so. I will be freer than and would like to spend more time discussing those matters in greater details.

(signed by Mieczysław Warmus)
Wrocław 5, Stalingradzka 58/1.

Wrocław, dnia 12 sierpnia 1953 r.

Drogi Panie !

Formalności związane z Pańskim przeniesieniem się na stałe do Wrocławia dobiegają końca. Kierownik naszej zespołowej katedry matematyki prof. Ślebodziński rozmawiał w tych dniach o Panu z Rektorem Politechniki i ustalono, że może Pan już stawić się do pracy od 1 września b.r. Papier nominacyjny z reguły przychodzi dopiero po kilku miesiącach, a słowa Rektora są już wystarczającą gwarancją pomyślnego załatwienia sprawy. Myślę, że dobrze by było, aby Pan zjawił się we Wrocławiu 30 sierpnia tak, aby 31 sierpnia złożyć wizytę albo conajmniej zgłosić się przed południem na Politechnice u prof. Ślebodzińskiego. Taka gotowość podjęcia pracy w przepisowym terminie zawsze robi dobre wrażenie. Po przyjeździe do Wrocławia najlepiej jeżeli Pan w pierwszym rzędzie zwróci się do p. Romana Kapały, delegata młodzieżowego do spraw przyjmowania studentów na I rok studiów, którego Pan znajdzie na Pl. Uniwersyteckim 7 w Dziekanacie Mat.-Fizycznym Uniwersytetu. On da Panu skierowanie na kwaterunek w Domach Akademickich (narazie są tylko kwaterunki, przydziały mieszkań są załatwiane później, po rozpoczęciu roku akad.). Ja go nie znam, ale proszę się powołać na asystenta matematyki Rościsława Rabczuka. Gdyby były jakiekolwiek trudności z zakwaterowaniem Pana, proszę zawsze jechać do mnie, jakoś Pana u siebie bym ulokował, póki nie usunęłoby się tych trudności. Pierwszą wypłatę pensji powinien Pan otrzymać ok. 15 września, dobrze by jednak było na wszelki wypadek mieć zapewnione warunki przetrzymania we Wrocławiu bez pensji przez pierwszy miesiąc. (Oczywiście pensja za wrzesień mimo opóźnienia nigdy Panu nie przepadnie). Ja się zjawię we Wrocławiu najdalej 2 września wieczorem, ale najprawdopodobniej będę już 1 września. Gdyby mnie nie było, a miałby Pan trudności z zakwaterowaniem, zawsze Pan może u mnie się narazie ulokować, bo ktoś w domu zawsze będzie i będzie uprzedzony, że Pan może przyjść.

Prosił Pan, żeby napisać coś jeszcze w sprawach matematycznych. Niestety złożyło się wiele spraw na to, że tego lata zamiast odpoczynku mam urwanie głowy i nie mogę się zabrać do matematyki. Chcę natomiast w ciągu sierpnia pozbyć się na tyle kłopotów różnego kalibru, by od września mieć więcej czasu na matematykę. Z drugiej strony przed Panem stoi rok wytężonej pracy i radziłbym ostatnie dni lata wykorzystać na pełny odpoczynek. Od 1 września zakaszemy rękawy i weźmiemy się zato żwawo do pracy.

Łączę serdeczny uścisk dłoni

Mieczysław Warmus

Document 45. Mieczysław Warmus's letter to Mr. Stefan Paszkowski

(Translation of the above letter follows:)

Wrocław, 12 August 1953

Dear Sir!

The formalities related to your permanent transfer to Wrocław are nearing their final stage. Head of our Combined Faculty of Mathematics, Professor Ślebodziński, spoke some days ago to the Rector of the Polytechnic about your transfer. It has been decided that you should report for duties here, in Wrocław, on the 1st of September of this year. The actual appointment paper normally does not arrive until several months later but the Rector' s word is, of course, sufficient guarantee of a successful conclusion to the matter. I think it would be good if you could come to Wrocław on the 30th of August so that on the 31st of August, in the morning, you could pay a visit to or just call on Professor Ślebodziński at the Polytechnic. Such demonstrated readiness to take up duties in the prescribed time never fails to make a good impression. After arriving in Wrocław, the best course of action for you is to talk to Mr. Roman Kapała, youth representative for enrolment of first year students. You will find him at 7 University Square in the Dean's Office of the Faculty of Maths-Phys. He will issue you with a requisition for student accommodation in Academic Residence (this is a temporary arrangement only; allocation of apartments happens later, after the beginning of the academic year). I do not know him personally but you should mention to him the name of Rościsław Rabczuk, assistant in mathematics. If there are any difficulties with your accommodation you can always stay at my place until the problems with you accommodation are resolved. You should be paid you first salary around the 15th of September. However, it would be good if you could ensure that you have means to survive in Wrocław without your salary during the first month. (Even if your September salary arrives late, it will never be lost). I will return to Wrocław on the 2nd of September at the latest but most probably I will be back on the 1st of September. If I were still away and you were experiencing difficulties with accommodation, you can always temporarily stay at my place. My family will be forewarned about your possible arrival and there is always someone home.

You did ask me to write more about mathematical matters. Unfortunately, a number of events this summer contributed to the fact that, instead of relaxing, I am forced to deal with various burdens and consequently have no time for mathematics. I would like to get rid of most of those distractions in the course of August so that I could spend more time on mathematics from the beginning of September. On the other hand you are facing a full year of very strenuous work and I would like to recommend that you spend the last days of summer entirely given to resting and relaxation. Starting on 1 September, we will roll our sleeves up and delve into work. I enclose my warm regards

(signed by Mieczysław Warmus)

I stayed at the Polytechnic only for a year. Later, again thanks to Professor Warmus, I began working at the Wrocław Chapter of the Institute of Mathematics of PAN (Professor Warmus also worked there). This provided me with new experiences and allowed me to devote more time to scientific research.

I stayed working in Wrocław for three years. My scientific interests were becoming crystallized and Professor Warmus never imposed upon me any particular thematic direction. However, I often availed myself of his advice and critical comments. I completed several smaller projects for him but above all I followed his suggestion and participated in the preparation of a paper [item 21] (This is the numbering system used in Mieczysław Warmus's bibliography - S.P). The paper, as far as I know, owed its inspiration to Professor Czekanowski and contained a description of a mathematical method used to assess anthropological types. I found discussions on this paper to be exceedingly illuminating and inspirational.

In the years 1953-1956, and later as well, the scientific interests of Professor Warmus were extremely wide-ranging. I am not competent enough to discuss them here. However, for various reasons, I continued to read certain papers written by Professor Warmus and I would like to share here my impressions of these.

I was asked to undertake an editing job (a function obviously of a technical nature) of a volume of proceedings of the Wrocław Scientific Society containing Professor Warmus's doctoral thesis entitled "O obliczaniu pól obszarów płaskich..." (On computation of two-dimensional areas…) [14], so I had to read carefully the whole paper. I was astounded by the subtlety of reasoning, half analytical, half geometrical, taking the reader on a long journey towards the final elegantly presented conclusion. I was rightly or wrongly "nitpicking" some minor faults and Professor Warmus, without a trace of ill will, made the changes which I suggested.

Professor Warmus used to spend a lot of his time then, as well as after his return to Warsaw, on preparation of the tables of functions, so necessary in that pre-computer era. These were:

1. *36 digit tables of natural logarithms in Polish version [item 8] and in French version [item 11] including also very cleverly designed methods utilized by the author in his calculations (and he only had an electric arythmometre at his disposal!);*
2. *Tables of elementary functions [item 41] with Polish and English explanations; in my opinion they were second to none worldwide and I am honored that I contributed some calculations; and*
3. *Tables of Lagrange Coefficient [items 42 and 43]; these only lost their applicability with the advent and introduction of computers.*

Professor Warmus also took on interest in nomography that is in a certain class of graphic methods used to calculate approximate values of functions or to solve a set of equations.

It is quite possible that the first impulse for his interest in that area came from a very specific technical task, described and solved in [item 9]. I suspect that Professor Warmus was not satisfied with the presentation of nomography found in then available Polish and Russian textbooks, so he decided to construct a solid theoretical foundation for this discipline. He presented these in his extensive monograph (item 22) on the so-called nomographic functions. Although he mentioned the inspirational writings of a Russian mathematician Wilner, but the originality, completeness and scientific and practical importance of his results are beyond a shadow of a doubt.

In Poland, during the fifties of the last century, the knowledge of numerical analysis and the recognition of its practical value were almost non-existent. It was then that the very first book on a certain aspect of numerical analysis was published. It was a translation from the Russian language. It only emphasized the merit and contribution of Professor Warmus who, together with Professor Łukaszewicz, produced the very first Polish textbook of numerical and graphical methods [item 23]. The book was intended to be the first part of the larger design; unfortunately the second part never saw the light of day.

The textbook became very useful when, at last, Polish universities began to train specialists in the theory of numerical methods and in informatics. It goes without saying that the introduction of computers radically changed the perceptions of value of many classical numerical methods and, at the same time, gave an impulse to seek new solutions. That is why those textbooks from over fifty years ago have only retained their historical value. However, one has to give recognition to the unquestionable significance of Professor Warmus's ideas presented in that book. This applies particularly to the whole area of calculations involving approximate numbers; one can easily detect here the beginnings of the emergent theory of interval arithmetic, which is still being developed today. I also suspect that the construction of the above mentioned tables led Professor Warmus to a more serious interest in the problems of rounding errors.
It is a matter of regret for me that Professor Warmus, due to his diverse interests and a burden of his various professional duties, was unable to continue his work in this area.
It was potentially a very rich source of problems and topics, as it became obvious later on from Wilkinson's work.

In 1956, I went for a research training practice at the University of Moscow. There, during my work on the theory of approximation, I had access to a comparatively

well working computer. This directed my interests towards informatics (this term was not in use then).

After my return in 1958, my employment at the Institute of Mathematics of PAN in Warsaw was already secured. Professor Warmus, who had earlier returned to Warsaw from Wrocław, tried to persuade me to undertake employment at the research unit under his direction, in the Nuclear Research Institute (IBJ PAN). Not only did he manage to secure my employment contract in his unit but also, after a prolonged campaign, managed to procure an apartment for me in Warsaw, which really bordered on a true miracle. Earlier, he had suggested kindheartedly that, until I manage to find some accommodation, I could stay in his family apartment in the Warsaw district of Praga.
I was very grateful for all that but did not take up the kind offer as I realized that an additional person in the apartment would seriously inconvenience the whole family.

In 1958, Professor Warmus had good reasons to assume that his unit at the Nuclear Research Institute would soon have its own computer, which was being built by an engineer, Mr. Marczyński. This would allow him to undertake some serious work in programming and application of computers.
However, the process of building the computer was very slow and it was too early to create programs for it. There was a working computer XYZ, in the Department of Digital Computers of the Institute of Mathematics, PAN (IM PAN). However, it never produced reliable results and one could say with a touch of irony that its very name - "XYZ" suggested the great unknown as far as results were concerned. My critical comment about the "XYZ" seemed to have offended the Director of the Institute.

After my return from Moscow I was extremely eager to utilize computers in my own research and I was rather disappointed with the lack of such facility in Warsaw. Consequently, despite Professor Warmus's earnest advice against such action, I resigned from the Nuclear Research Institute and from the Institute of Mathematics of PAN. In the end I decided to return to Wrocław.

But this is an entirely different story and I only mention these events here because they ended my frequent contacts with Professor Warmus. I know that he had worked extensively in many mathematical disciplines as obviously attested by his monographs [items 67, 68, 70 and 91]. However, I have no idea why his results never found proper resonance among mathematicians. I suspect that creating and leading the Computation Centre of the Polish Academy of Sciences was often thankless and unrewarding work as so much depended on the capricious decisions of the political bosses, on scheming secretaries of the local governing party cells, etc.

During our, unfortunately, increasingly rare meetings I could not help but admire Professor Warmus's optimism and unlimited enthusiasm for work against all adversities. I had the honor of being his host in Wrocław and my wife also found him extremely likeable and shared my respect for him.

In their recollections, Professors Józef Łukaszewicz and Stefan Paszkowski provide a good insight into Mieczysław Warmus's personality and achievements, particularly during his academic work in Wrocław.

Professor Warmus's personal papers, dating back to that period in his career, contain names of many more people with whom he maintained close contact. Two of these names merit our special attention: Rościsław Rabczuk i Roman Zuber. Professor Warmus was the supervisor of their doctoral theses.

Dr. Rościsław Rabczuk is a research scientist at the Faculty of Fundamental Problems of Technology at Wrocław University of Technology.
He is well known in the world of mathematicians (and beyond) as the organizer of International Championships in Mathematical Games, in his (unpublished) work entitled: *Professor Mieczysław Warmus*, Wrocław, May 2003, remembers particularly well the period during which Professor Warmus conducted Seminars on Numerical Methods.

"Mieczysław Warmus lectured at many faculties, particularly at the Faculty of Electrical Engineering, He was regarded as an excellent teacher and lecturer and was generally liked by students. Since 1954 until the end of his residence in Wrocław, he was the Head of the Numerical and Graphical Methods Section, and in the years 1957 - 1958 he was Head of the Faculty of Mathematics. In 1954, he created a Numerical Methods Seminar, which during 1957 - 1958 focused, among other issues, on problems related to (electronic) digital computers. Among the more prominent members of that Seminar were Julian Dębowy, Ryszard Nowakowski, Rościsław Rabczuk, Romuald Rutkowski, Ryszard Wrona and Roman Zuber.

Mieczysław Warmus was the supervisor of the doctoral theses of R. Rabczuk and R. Zuber."

Tadeusz Styś, currently Professor at the Faculty of Mathematics, Botswana University in Africa, was Mieczysław Warmus's doctoral student and his collaborator and colleague in the Nuclear Research Institute of PAN (IBJ PAN) as well as in COPAN.
His recollections cover the period of over twenty years of close cooperation and personal contacts:

Professor Tadeusz Styś

Faculty of Mathematics
University of Botswana
Botswana, January 30, 2002

A recollection of my work with Professor Warmus
in the years 1960 - 1980

As it is well known, computerization in Poland began at the end of nineteen fifties, firstly in academic institutions and then spreading to the industry, commerce and administration. This new area of scientific research and its applications were exceptionally important for the development of the country and the most outstanding minds in technology and science were engaged in creating its foundations. In those years Professor Warmus was Head of the 12th Department of the Numerical Calculations and Programming of the Nuclear Research Institute of PAN (IBJ PAN). It was the first organization in Poland, which engaged in introducing modern calculation methods of applied mathematics. Simultaneously, the labor market created interesting perspectives for young tertiary graduates. In September of 1960, when I was fresh out of the university, Professor Warmus offered me a job at the Department of Numerical Calculations of the Nuclear Research Institute. It was in those circumstances that I began my long-time employment in the research centers organized by Professor Warmus, a man of boundless enthusiasm, profound knowledge and infinite experience in scientific research.

In the summer of 1961, Professor Warmus received a go-ahead from the Polish Academy of Sciences for the purchase of a digital computer Urał-2 and setting up of the Computation Center. September of that year saw the birth of the Computation Centre of the Polish Academy of Sciences (CO PAN). A digital computer Urał-2 was imported, however without even most basic programs. Professor Warmus, Executive Director of COPAN, initiated work aimed at producing programs for the Urał-2 computer. He organized a programming laboratory, two research sections dealing with modeling and statistics and numerical methods. He created a team of engineers to service the Urał-2 digital computer, and a library. He also lectured and conducted departmental seminars.

Simultaneously, he lectured in statistics and programming languages at the University of Warsaw and supervised MA and PhD theses of his students there. He created a very positive environment for many young people to engage in scientific research and to advance their careers. Regular seminar meetings and lectures were very helpful in research and programming work, particularly for those writing their PhD theses. I was one of many participants of those seminars and lectures conducted by Professor Warmus.

In April of 1965, after returning from my research training at the Lomonosow University in Moscow, at a general seminar for the researchers of COPAN, I read my paper entitled "Metoda charakterystyk dla quasiliniowych układów hiperbolicznych" (The method of characteristics for quasilinear hyperbolic systems). Later I wrote a program in the internal code of the Urał-2 computer, which was based on this method.

The work at the Computation Centre included scientific research in informatics, applied mathematics and applications of statistics. COPAN also offered wide-ranging services in programming and calculations to other research, industry and national economy centres. At the beginning of the nineteen sixties, together with Professor Warmus I was engaged in conducting calculations for Professor Zbigniew Wasiutyński, Head of the Faculty of Bridge Construction and Engineering of the Warsaw Polytechnic. At that time we were working on the numerical calculations concerning a border problem for a nonlinear, elliptical fourth-order equation. In the first half of the sixties, with Professor Warmus's help, I was conducting calculations for the Institute of Nuclear Research in Kraków. Those calculations concerned a geometrical model of splitting atoms in vacuum chambers.

Professor Warmus took a lot of interest in the professional advancement of his research staff in COPAN. He supervised many doctoral theses. Among others, he was the supervisor of my doctoral thesis entitled "Zasada maximum dla pewnych układów równań różniczkowych" (The maximum principle for a certain set of differential equations), which appeared in COPAN publications in 1968. Professor Warmus passed his great knowledge and experience in scientific research on to younger people with unwavering enthusiasm and passion. Many of us owe our advancement in professional careers, both in Poland and overseas, to Professor Warmus's unfailing support for young talent.

The political and social changes in Poland during the sixties and later were not particularly conducive to the further development of COPAN. Many of us decided to look for other work opportunities. On the recommendation of Professor Warmus, I also moved to the University of Warsaw but continued to maintain close contact with the Professor.

During the eighties the working conditions deteriorated to the point of becoming extremely difficult in all aspects, also economically. I decided then to seek employment in Africa. In 1980, my whole family, including four children, left for Nigeria. Both my wife and I found employment at the University of Jos. Our doctoral theses supervised by Professor Warmus, and our expertise and experiences acquired under his tutelage, were of enormous assistance to us in conducting lectures and producing further publications so necessary for extending our contracts with the University.

After our departure from Poland our contacts with Professor Warmus became sporadic. Our last meeting, before he left for Australia, was in the summer of 1984, in Warsaw, in Mr. and Mrs. Warmus's apartment. Undoubtedly, Professor Warmus's illness made our further scientific and personal contacts somewhat difficult.

During my long association with Professor Warmus I came to know him as a highly amiable person of happy and smiling disposition, who was also extremely diligent and always keen to raise the public profile of applied mathematics. I also remember him as a fervent supporter of Polish Christian culture. I would like to offer some further facts here. At that time, in the Academic Church in Krakowskie Przedmieście in Warsaw, various professors of theology held public lectures for tertiary students. There, I frequently saw Professor Warmus deep in prayer. In the same church I also used to meet Professor Wacław Sierpiński. On many other occasions I came to know Professor Warmus's exceptionally pragmatic and, at the same time, idealistic views and ideas.

In the summer of 1961, in a group of six, we went with Professor Warmus to Moscow for a month to train in programming of the Ural-2 digital computer. These were our first experiences of conducting calculations with the help of a digital computer. We then had a unique opportunity and a great pleasure of spending some of our free time in the company of Professor Warmus in the Moscow Park of Culture and Recreation.

Professor Jan Mieczysław Warmus is an eminent Pole and a person of profound knowledge and faith. I take this opportunity to offer in this place my expression of deep respect and the highest regard for him.

Professor Tadeusz Styś

In his recollections, Professor Władysław Turski from the Faculty of Mathematics, Informatics and Mechanics of the University of Warsaw, gives a very detailed picture of the "Warsaw" period, during which Professor Warmus, then at the apex of his professional career, organized the Computation Centre of PAN, currently the Institute of Computer Science of PAN (Instytut Podstaw Informatyki PAN).

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Warsaw, July 2002

My first years in COPAN

In the summer of 1961, I returned from my research training in Manchester (more precisely in Jodrell Bank). I was an astronomer, specializing in the mechanics of space, with a practical experience in calculations on a Mercury computer, which allowed us, my British boss, J.G. Davies and myself, to solve the mystery of appearance and disappearance of a meteorite cluster connected to the Giacobini-Zinner comet. Those several hundred hours of calculations could be done today in a matter of minutes on an ordinary home computer. However, then it was a pioneering work involving the use of a digital computer to simulate space phenomena and one of the first successful non-military and non-commercial applications of computers in "big" tasks. It then became a dream of mine to continue a research work, similar to that in England. Unfortunately, there were no digital computers capable of performing more demanding calculations in Poland at that time. There seemed to be a shadow of a promise in the newly established Computation Centre of PAN, which was just about to import the Soviet Ural-2 computer. So, this was where I made my first enquiries upon my return.

My first contact was with the organizer of COPAN (and its future first director) Professor Mieczysław Warmus, Head of the Department of Applied Mathematics of the Nuclear Research Institute, which was the source of personnel and equipment for the emerging Centre. Today, from the perspective of more than forty years, I understand perfectly well how diametrically opposed our interests were. My primary aim was to gain access to a computer. I wanted to continue my important calculations and do as many of them as possible as my portfolio was brimming with research projects that required urgent attention. Professor Warmus, on the other hand, was interested in employing a researcher with some exposure to, and experience in, utilization of a digital computer, particularly in an academic environment, as COPAN's major role was to provide computation support for all sections of the Polish Academy of Sciences and, to some extent, for the academic and research institutions of the whole Warsaw region.

So we reached a bargain - Professor Warmus promised me to create a Laboratory of Space Calculations, and I accepted a position with a group of programmers under the direction of Marek Greniewski[1] We both kept our sides of the bargain: on the 1st of September 1961, I began working as an URAŁ computer programmer. After receiving my doctoral degree in January of 1962, I got my own laboratory.

In September of 1961, the URAŁ computer had not arrived in Warsaw yet, and the Centre was at a stage of successively settling into the allocated space and offices in the Palace of Culture and Science. Professor Warmus turned out to be a very energetic and accomplished organizer. In the course of the next few months, new and specially designed functional furniture was installed in the workrooms and workshops. In those days every computation centre had to have its own servicing and technical support teams - the electronic systems often failed, sometimes crashing completely; mechanical power elements such as magnetic drums drivers, tape stations and other peripherals also frequently required servicing and repairs, not to mention problems with air conditioning. Let's not forget that digital computers of the URAŁ class weighted several tons, they included several thousand "radio" transistors located in numerous huge cabinets, needed tens of kilowatts of power and radiated out much heat. A very good library was also created together with a superbly designed (by Zbigniew Michejda) reading room, which was equipped with communication link connecting the Centre to the world by teletype. There was also a "dust copier" (an ancestor of the modern photocopiers), one of the first in Warsaw. A good cafeteria was also established. It soon became a magnet for "half the Palace". Professor Warmus even took care of such mundane details as unusual stationery and very cleverly designed plastic document folders (I use several such folders even to this day). Nowadays all these things do not seem too difficult to organize; they would be just a matter of funding. However, in communist Poland of the sixties of the last century, it was not enough to have funds available. It took much, much more - currying favors with the decision makers and patient negotiations to secure appropriate licenses and permissions, finding someone to carry out the project, begging for acceptance of orders, overseeing the building process and the supply of materials (so that they were not hijacked by someone else). Professor Warmus was very successful in all that, partly because he was supported in his efforts by a tandem of trusted helpers. Jan Wróblewski, a soft-spoken, old-style gentleman, a pre-war diplomat with impeccable manners, was one of them. He was irreplaceable in difficult negotiations with the local communist authorities and, without a smallest sign of impatience, could spend hours in the waiting rooms of various dignitaries if this was what was required to get things done.

[1] Here and in other places, I omit my colleagues' titles; in the last 40 years, many of them have advanced from Batchelor to Professor positions; it is now difficult to decide, a title from which era to use.

Mr. Marian (?) Makoś, on the other hand, could always find the right way to communicate with master-builders; materials supply managers and the ladies from the distribution departments.

Thus the premises, which were to house the Centre, were taking shape at a very good pace, considering the reality of the times. I, on the other hand, was learning how to program the URAŁ computer, in theory only as the machine itself had not arrived yet. However, the more I was learning the sadder I became in my heart. I had been used to a comparatively trouble-free programming in Manchester Autocode, and here I was faced with the necessity of programming in the octal internal language of the Russian computer.
It has to be said that while the structure and the parameters of the URAŁ machine were not that far from the world standards, expected of the computers for "scientific calculations" (this is how we spoke about them then!), the existing programs for the machine were absolutely pathetic. The authorities appeared to derive some sadistic pleasure in making our communication with the outside world extremely difficult so it was almost impossible to get outside help.

Except for the command console with its binary keys, the only entry point to the computer was a tape-reader. It took a wide, perforated film tape, in which rows of square perforations had to be done by hand. As the reader was prone to failure, the tape had to be glued together many times over, which allowed countless tries of inputting the same program. Tens of meters of the tape were twisting and knotting relentlessly. There was special equipment, which was to prevent all that from happening, a sort of tape-holder; it had a shape of a circle of pickets, tens of centimeters in a diameter. The reader demanded a constant speed of linear movement of a tape that resulted in different angle velocity between external and internal rolls of tape on the circle of pickets, producing friction on a tape. The tape was getting so hot that it started to melt on its surface and to glue together. That part of the tape had to be removed and thrown away. For that reason alone, the programs had to be short, so the reels of tape, on the circle of pickets, were not too big.

A peripheral output, apart from binary lamps on a console, was a printer; quite fast, printing 20 rows per second. Unfortunately it could only print one number in a row (in an octavo system or a digital system, but no letters!); on printing paper, rolls of which closely resembled smooth toilet paper.

We decided that it was quite impossible to progress work in such circumstances.
With the approval of Professor Warmus it was decided that a group of electronics

engineers would work out a method of connecting a teletype[2] to the computer, as an input/output device, and that another group, this time of programmers, would produce a simple alpha-numeric language for symbolic programming of the URAŁ machine, so that we could use variable values (x, y,…), symbolic names of subprograms (sin, sqrt,..), and divide a program into sections, etc.

The efforts to "civilize" the URAŁ computer ran parallel to the installation work on the newly arrived machine. Marek Greniewski and I designed the language called KLIPA, which was, to some degree, patterned on the Manchester Autocode and with the help of two Jadwig's: Empacher and Zdanowska (later Tarasiuk) and Ryszard Solich, we implemented that language into URAL[3]. That implementation was a success and until its final days, we programmed URAL in KLIPA. Later, when ODRA 1204 arrived in COPAN, we were transferring all the programming to the new computer, using inclined translator URODA (B.Muchlado-Maronska, J. Olszewski, E. Stolarska, J. Tarasiuk and W.M. Turski).

With Professor Warmus's permission, we forwarded a paper on our programming achievements to the ACM[4] yearly conference, in 1963.
Today, it sounds quite ordinary, but that was all happening in the "cold war" era. The authors of a paper had to have a nerve to present it and the head of the company had to have courage to allow for contacts with "the other side", as he was the one who took most of the risk. The paper was accepted, Americans have even promised to pay for presenter's travel and accommodation expenses. I was nominated as the presenter, my fluent English as the deciding factor.

In September of 1963, I presented the first paper on Informatics, "from behind the Iron Curtain", on American soil. Only one year after its creation, COPAN became known to the international, scientific forum. The fact that the contact was established on the "ground level" and not, as it was then the rule, on top, on the "central control level", became a sore in the eye for the servile academic establishment in Poland. After a few years time, they took a severe revenge on this and other 'misbehaving" of the rebellious company and its CEO.

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[2] A teletype was already used as an input/output device, in 65 EMAL computer, constructed in IBJ (Institute of Nuclear Research) and moved to COPAN. Romuald Marczyński was the principal constructor of that computer; He was supported by the team of electronic engineers: Kazimierz Bałakiera, Leszek Niemczycki, Zbigniew Grzeszczyk and Piotr Dziekoński. The whole team, including its leader, moved to COPAN.

[3] In creation, we used unconventional translation of alpha-numeric names to memory addresses; that trick – invented independently in various forms, in several centers – is known as "hash coding" see D.Knuth "The Art of Computer Programming", Vol 3, chapter 6.4

[4] Association for Computing Machinery – American (USA) informatics association.

Professor Warmus was fully aware of the necessity of improving means of access to the computer. In the early years of COPAN, he used to put several people into prone-to-breakdowns, company's minibus "Nysa" to visit the International Poznań Fair. The purpose was to have a glimpse of the latest technological advancements with a hope of possibly introducing them in the Centre. One of such outings to Poznań allowed us to establish close cooperation with a Swedish company Facit, the maker of fast tape readers and paper tape perforators, which soon became the only input/output devices for the URAŁ computers working in Poland. Technological solutions worked out in COPAN were eagerly studied and copied by other centers such as the Military Academy of Technology (WAT), which used the same type of computers.
The decision to furnish URAŁ with a tape reader and other related equipment had a considerable, historic importance for the evolution of Informatics in Poland. That decision was far reaching well beyond faster input/output operations and ability to program and publish results in an easy, readable format. A large community of URAŁ users – that was the first generation of Informatics users in Poland – became accustomed to elegant presentation of computational results and to the freedom of text based programs, written on a sheet of paper. That was possible due to the use of teletype and, some time later, electronic flexo-writers, controlled by perforated paper tape, as instruments for program writing and presentation of results.
That community would never accepted the restrictions that were characteristic for other, then popular input/output medium – perforated cards.

When observing the geography of the acceptance of then modern languages – Algol and Pascal, it is clearly visible that these languages were sooner adopted by the centers of "paper tape culture" and not so well by the centers dominated by "perforated card culture".

Today, when universal, specialized terminal printers and data transfers are used world-wide, both, the paper tape and the cards became obsolete. It is now even hard to imagine, but this is a historical fact, that Fortran and Cobol were used where perforated cards were dominant. That trend continued, together with the use of various forms of programming, for a considerably long period of time, long after Algol and Pascal paved the way for structured programming.

In today's Poland a high-class programming is quite common. This cannot only be attributed to the fact that COPAN, from the very beginning decided to use perforated paper tape, but importance of that fact was paramount and started a chain of connected events. I shall come to that topic further on.

The programs delivered together with the URAŁ computer were, as mentioned before, of very poor quality. This also applied to the whole collection of numeric programs and even to the procedures, calculating elementary functions.

The whole library had to be re-written by a team of COPAN numerical methods specialists (mainly Zenon Szoda and Andrzej Sadowski) under the direction of Professor Warmus. After designing basic algorithms, they undertook to create the numerical library, which was being published concurrently in "Numerische Mathematik" and in "Communications of ACM". For this purpose, they enlisted the cooperation of specialists in the theory of numerical methods from the University of Warsaw and other centers. The above foreign models and standards prompted Professor Warmus to take serious interest in Algol-60 as a publication language. On his initiative, which was so finely tuned to the interests of the programming team, COPAN became an ardent advocate of that language in the whole Warsaw region. At the same time Stefan Paszkowski was popularizing the Algol language in Wrocław[5]. Good relationships between these two Centers (Professor Warmus's Wrocław roots were of some significance here!) brought some valuable outcomes including M. Warmus's textbook for students as well as Paszkowski's textbook and carefully designed glossary of Polish terminology. The culture of the Algol-60 language was well and truly entrenched in Poland even before it was possible to make any calculations in this language.

Contacts with Facita helped to introduce a Danish company - Regnecentralen, producer of a superb computer II. That computer, designed by Peter Naur, was built in semi-conductor technology and was equipped with Algol-60 (cult) translator. In 1964, computer II appeared at the Faculty of Mathematics and Mechanics[6] at Warsaw University, firstly, for several months, as the main attraction of an exhibition and then permanently. I would like to mention here that in those years COPAN and the Faculty of MMUW were taking quarters on several adjacent floors of the Palace of Culture and Science, which at that time performed the role in accordance with its name. Employees of the Centre were eagerly taking part in Gier's assimilation process on the new premises.

The success of the exhibition and a sweeping career of Algol-60, as a practical programming language, formed the face of Poland's academic Informatics. Gier's great success, as a practical computer, was also the first sign that the days of lamp-based computers, such as URAŁ , were numbered, even in Poland[7].
During that time the presence of the URAŁ computer in the Centre enabled the expansion of research areas involving informatics methods.

Professor Warmus personally undertook studies into the issues of medical and

[5] In those days, Warsaw and Wroclaw were the only Informatics Centers in Poland.
[6] Today: Mathematics, Informatics and Mechanics.
[7] The contrast between the room full of metal cabinets, that were parts of the lamp-based URAL and an elegant GIER's cabinet, with wood veneer finish, was shocking. One of the officials, visiting the exhibition expressed the view, that "that small, wooden box is the evidence of Danes' technological under-development".

biological applications of numerical methods, which related to his interests in statistics. He also successfully sought cooperation on those projects with academics and researchers from many other Centers. To this day, I can clearly remember those three-dimensional models, made of color-coded wires[8] and designed on the basis of laborious computer calculations, displayed in his office (Computer assisted graphics were only a distant dream of the more enterprising and futuristically-inclined researchers of the MIT[9]). There were also attempts to design practical computational models in econometrics, but in that area (as far as I remember) not much progress was made.

The laboratory for astronomical computations[10] soon became a topic for criticism by authorities, due to its "useless wasting of computation power".
Calculations of comet orbits and calculations of tracks of matter flow in double stars bore no importance to the management of the Technical Sciences Division of PAN. That Division was set to supervise COPAN and subsequently the entire field of Informatics; the negative consequences of that arrangement are still felt in today's Poland.

With Professor Warmus permission, without giving up the continuation of astronomical computations, COPAN started to engage in the touted "practical calculations" of earth's artificial satellites' ephemeredes. The work in that area was quite interesting. Ephemeredes' service was created for tens of observatory stations, in several (communist) countries. All those stations were connected to COPAN's Ural by the means of a teletype. That primitive "computer network" became an eye-opener for Astrosoviet scientific outfit of the Soviet Academy of Sciences, who awarded COPAN with a special Appreciation Award. Our network also caught an attention of delegates taking part in COSPAR conference in Warsaw. One of the delegates was A. van Wijngaarden, the co-author of Algol-60 and the principal author of Algol-68. That contact contributed to our participation in the Working Group IFIP[11] that was working on Algol. In 1965 I joined the group as a member to become its Director of Science (Sekretarz Naukowy) in 1966.

Professor Warmus made it his particular goal to ensure that functions of COPAN were not limited to providing computation services; he wanted the Centre to be also a well functioning research institution. I have already mentioned the well-stocked (for those times, anyway) library, which subscribed to all the important informatics

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[8] inż. Jerzy Reszel's composition.
[9] *Massachusetts Institute of Technology* – the birthplace of the majority of innovative computer usage techniques.
[10] The permanent members of the team were: Jacek Olszewski, Wojciech Pachelski and Krzysztof Ziółkowski.
[11] International Federation of Information Processing

periodicals and publications and which, every year, was buying all new publications at the International Book Fair in Warsaw. Perhaps now is the right moment to mention the Center's continuing endeavors to organize its own publishing arm. It must be said that the projects aiming at establishing its own dedicated periodical were met with resistance from the leadership of the Academy. Many materials, however, did get published: mini-monographs and textbooks bound in a similar way (the so-called "yellow books"), three or four folios containing several research papers by various authors were also published under a common title of "Computatio", numbered in order of appearance. Unfortunately, because of the lack of any official status of the irregularly appearing periodical, it failed to command sufficient recognition among its readership or to attract attention of potential authors as the papers published in "Computatio" did not count in the official research output which was so important in academic promotions.

In September 1964, Prof. S.Gill, whom I met in Manchester while on my earlier work assignment, was nominated Head of the newly created School of Computing, at the Imperial College of Science and Technology in London. He invited me to his faculty and I spent the whole next year in London. My two and half year experience gained in the attempts to civilize Ural turned out to be very useful. At the Imperial College I had to lecture on two unrelated subjects[12] : "Translation methods of programming languages" and "Qualitative theory of common differential equations". (The later topic was a subject of my earlier collaboration with Prof. S.Gill).

In London, I used computers such as "giant" IBM 7094 and smaller, but equipped with a graphical terminal, PDP-8; both computers were based on semi-conductor technology. Flexibility and reliability of these computers have finally convinced me that Ural, based on lamp-technology was not worth any further investments. On my return to Poland, I happily accepted prof. Warmus's request to participate in work undertaken by "Elwro", based in Wrocław – the first company in Poland, set to undertake commercial production of computers. A chance was emerging for COPAN to secure an ODRA-1204 computer, built in semi-conductor technology.

Prof. Warmus, for some time already, was interested in collaboration with "Elwro". Not without importance, were his sentiments towards Wroclaw's Mathematics' and Informatics' centres. In those centres, there was no resentment towards COPAN that was felt in Warsaw, mainly from the Academy (PAN). Firstly, as a part of that collaboration, COPAN was involved in writing libraries of programs for smaller

[12] Such a span of qualifications was characteristic for the first generation of IT professionals, who usually already had been experts in some traditional science areas, before becoming IT specialists.

computers produced in "Elwro". I can not comment on that any further, as I wasn't taking part in that undertaking. Further on, however, in years 1966-67, I got engaged into that collaboration quite seriously. Many times we have traveled to Wrocław and many times our Wrocław's colleagues visited us in Warsaw, to discuss the programming for Odra -1204. A certain pattern of responsibility areas emerged; as far as I remember, it has never been formalised, but was consequently followed (up to a certain time!).

The fascination with Algol-60 was common, both for PKiN circles (COPAN and the School of Numerical Calculations of the University of Warsaw) and for the Wrocław University . That sentiment brought about a superb translator for Odra-1204, for that language; the principal authors of that translator was Jerzy Szczepkowicz (and his alter ego: Krystyna Jerzykiewicz)[13].
In COPAN, on the other hand, the work was progressed on a cutting-edge Operating System. In the fall of 1967, system SODA was implemented in COPAN on the computer Odra-1204 and basic tests of that system were performed[14].
The Operating System was two-active; according to author's design, system SODA was to allow simultaneous, conversational testing of new programs and running, from the pool, finished programs, at the background. That was achieved on a single-processor computer, without virtual memory. In an American review[15] *, SODA was proclaimed as one of two European operating systems that could serve as a model for American constructors.*

Just before Christmas of 1967, I parted with the Director of COPAN Professor Mieczysław Warmus. At the invitation of Professor Silvio Navarro I decided to leave for the United States to take part in a teaching program somewhat later called the ACM Curriculum-68. That wasn't a successful assignment. By the time I have reached the destination, on 6th of January 1968, prof. Silvio died in a plane crash. The team that he put together had dissolved within a dozen or so weeks.
I returned to Poland in the autumn of 1968. Unfortunately, situation in Poland deteriorated considerably. Following the March political purges, Professor Warmus lost his position in COPAN under most preposterous pretences.
"Elwro" factory was transformed to copy foreign computers and their programming. The work on system SODA and on other home-based projects was stopped.

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[13] That translator, which functionality was based on Naur's GIER, never had been properly documented in the scientific literature. It is a great pity, as for certain, it was one of the most significant achievements of Polish Informatics.
[14] The system design was assigned to me; its realization was the team effort, mainly J. Olszewski, J.Maroński and B.Muchlado-Marońska.

[15] See: CR 15783, from December 1968

A period of several years of a marked decline of COPAN followed, despite strenuous efforts to promote the Center's computation services, which were then becoming quite anachronistic. Moreover, the demand for such services was rapidly decreasing. The Centre also engaged in undertaking accidental and random research topics, which other institutions of PAN did not consider worthwhile. My conscience tells me that I should refrain from commenting on the "personnel and staff" movement accompanying this decline process of the Centre.

Below, Dr Krystyna Styś, Senior Lecturer for many years at the Faculty of Mathematics, University of Botswana in Africa (now retired), who was Professor Warmus's undergraduate student, later a doctoral student, and finally his co-worker and academic associate, recollects the same period in the life of the Professor. She presents that period from the perspective of a young student and an employee of COPAN; she particularly emphasizes Professor's noble-minded attitudes.

Dr Krystyna Styś
January 2003

Recollections of my work with Professor Mieczysław Warmus
1964 - 1981

I was in my fourth year of studies at the Faculty of Mathematics, Physics and Chemistry of the University of Warsaw when I first met Professor Warmus. It was in January of 1964 at one of his lectures in programming.

The topic of digital computers was very much the flavor of the times, as were programming languages, and most students were keenly interested in the subject of the lecture. The lecture itself was pitched at a high level but at the same time the material was presented logically and lucidly. We were all very pleased and encouraged by the attitude of the lecturer - his punctuality, elegance and order in presentation of his material, cultured manners. Each lecture was well prepared and interesting and there were always interesting jokes as a bonus. We liked those jokes very much as they were all mathematical.

The end of the year exam was conducted in the most professional manner. As always, some of the students failed the exam. It is students' nature that, when they fail an exam, it is customary to blame the lecturer. This was not so in the case of Professor Warmus's lecture and exam as those who failed tended to blame themselves with comments like: "unfortunately, we will have to sit down and study,

there is no other way", or "it was a good lecture; I did not study; I thought I would be lucky". After the exam, there was a surprise. All students who passed the exam with distinction received an offer of employment in COPAN. Professor Warmus was then the director of COPAN. I was in that lucky group of six students. We were very excited. To get a job in COPAN, while still a student of the fourth year, was a huge success. But there was still the fifth year to complete and an MA thesis to be written…Hence our mixed feelings of success and anxiety whether one will manage to reconcile professional work and further studies. Professor Warmus understood our concerns very well. Even before we had the time to voice our worries or ask questions, he came with the answers telling us everything about our prospective work in COPAN and explained the nature of our future professional engagements.

Very early in the academic year, we all received topics for our MA thesis. Professor Warmus supervised two dissertations; mine - on the subject of "Simplex Methods of Linear Programming" and that of Maria Jurczakowska on Parametric Programming. Other students in our group had supervisors who also were academic researchers in COPAN.

Throughout the academic year, Professor Warmus looked after us and encouraged us so that our work on theses was advancing very quickly. We all had to learn programming in Algol. We had access to the computer GIER at the University.

The beginnings were indeed difficult, given Professor Warmus's ambitious plans that our theses should be practically useful and our programs should be used in future to solve quite specific commissioned work. Therefore, the programs had to be well tested and written in the best possible way. In my case the difficult issue was that of linear programming which involved (in may project), on average, over a hundred variables and a similar number of conditions. I remember well how, together with Maria Jurczakowska, we were testing our programs for hours on end, still getting errors for certain variants of data. Professor Warmus quite frequently provided assistance in removing those errors.

In fact, all our supervisors were extremely helpful. Thus, it is not surprising that our whole group, encouraged by Professor Warmus, passed successfully all required exams at the end of our fifth year and completed MA theses before the deadline.

I would like to mention here my exceptional situation. I was a beneficiary of a scholarship funded by a secondary school in Łapy and, according to the contract, I was required to take a teaching position in that school upon my graduation from the university. However, Professor Warmus believed in my research potential and asked the COPAN Personnel Manager to negotiate release from my contractual obligations to the school in Łapy. The Personnel Manager herself accompanied me to Łapy and, after fruitful discussion with the school principal, I was free again.

Professor Warmus was to us much more than a director and an academic supervisor. I remember well our frequent conversations on various subjects such as marriage, family and important values in life. Immediately after my MA exam, I decided to marry one of the COPAN academics. I can recall my long discussion with Professor Warmus about marriage in general and his wise and useful counsel in relation to our new family situation. Now, in hindsight, I can appreciate even more the practical value of his advice. Professor Warmus was present at our wedding ceremony and reception. It was very pleasing and extremely important to us. Later on, over the period of many years, we quite frequently experienced generosity of Professor Warmus and his wife Helena. Sometimes Mr. and Mrs. Warmus visited us in our house in Warsaw.
Our adult children still have vivid memories of those pleasant, almost family-like occasions. I would like to emphasize that in the workplace discipline prevailed. Everyone had to sign the roll daily and we were all expected to produce tangible outcomes in our academic work. On the other hand, however, the atmosphere at the Institute was congenial and friendly. There was a well functioning canteen where we all met every morning over tea. Sometimes there were parties on occasions such as International Women's Day. As was customary in those days, we also celebrated International Workers' Day on 1 May.

Such celebrations used to begin with presentation of financial prizes, which were awarded by the COPAN Executive on the successful completion of important commissioned work. Long conversations and, sometimes, singing followed well into the night over a meal.

Professor Warmus was a very good organizer and enjoyed well deserved respect of his staff. Sometimes, lively political discussions erupted during seminars in those very "difficult times". On such occasions, the explosive atmosphere was aptly and instantaneously diffused by Professor Warmus, in a subtle manner.

As far as academic work was concerned, we had weekly seminars involving all staff at COPAN. Apart from this each department held its own weekly seminars. I was working at the Department of Statistics and my husband was employed by the Department of Differential Equations. COPAN maintained close cooperation with academics from other institutions and, as a result, many "outsiders" participated in our seminars.

Most of COPAN employees were young and Professor Warmus encouraged everyone to put as much effort as possible into academic endeavors, into continuing development of skills and, in particular, into finalizing doctoral dissertations. He himself supervised many doctoral dissertations, among them my husband's and mine. Professor Warmus endeavored to establish contacts with academic institutions abroad and worked hard to send as many young academics as possible

to various similar institutions in other countries, even if for a very brief period of time. Several academics from the Department of Differential Equations spent six months work experience at Lomonosow University in Moscow. I and another person from my group paid a month long visit to the Computation Centre of the Hungarian Academy of Sciences. There were many more such trips. In every case, the purpose had to be clearly defined for a trip to be supported and accepted.

Professor Warmus was well guided by his intuition as to the choice and formulation of COPAN's strategic research aims and topics. The problems were always topical, so that outcomes of the research work retained their practical value long after the completion of commissioned work. This also applied to doctoral and MA dissertation topics. In addition, Professor Warmus displayed expertise, research potential and knowledge of literature in various areas of mathematics that could be envied by many. Cooperation with academics and researchers in medicine, psychology, archeology, history may serve here as the example of his versatile talents and extensive knowledge.

Once again I go back in time to my MA thesis.
It does not happen very often that a program written as part of Masters course work would retain its applicability and relevance for many years. My "Simplex" programs and Maria's program in parametric programming were utilized for years by various institutions, in particular by the Academy of Agricultural Sciences in Lublin. There was also keen interest in those programs in COPAN itself as there was considerable demand for linear programming particularly in the context of the commissioned work. When COPAN bought its new electronic computer ODRA, I was asked to translate my "Simplex" from the GIER-Algol language to ODRA-Algol. These programs were then often used in our work on the new ODRA computer.
As a point of interest, in 1995, that is thirty years after the completion of my MA thesis, my "Simplexes" came into use again at the University of Botswana (Africa). One of the American academics, Professor John Michem (San Jose State University), encountered an interesting problem in linear programming. He was unsuccessfully searching for a system/program suitable for a personal computer (PC). I suggested that it would be best to write such a program as one could then take into account all the specific characteristics of the problem. He treated my advice as a good joke. In the evening of the same day I unearthed my well-worn "Simplex" and translated it into Pascal. The next day the program was functioning and Professor Michem got his results. Indeed, everyone was surprised that thirty years ago MA thesis completed at the Warsaw University were of such high standard.

Professor Warmus was an extremely industrious person. He published many papers and wrote several books. I want to emphasize that his material intended for

publication was always well organized and thought through. Some chapters were presented at departmental seminars. Professor Warmus highly valued our comments and remarks. Generally, he typed his own texts and hand-wrote mathematical formulae with such precision as if his typewriter had Greek fonts and all mathematical symbols. Unfortunately, there were no PCs with programs to process mathematical texts such as LaTeX or Scientific Word nowadays. However, despite this, Professor Warmus could produce hundreds of typed pages a year with extremely complicated mathematical text. It was very difficult to find an error in his work. It seems strange, yet it is true, that books today, printed with the newest computer technology, contain so many errors. Authors, having easy access to processing mathematical texts, are not disciplined enough and do not even try to prepare their manuscripts in a well thought out and ordered manner.

Professor Warmus was a harbinger of the coming age of digital computers. He began with programs in the internal code of the URAL-2 computer. It required a well organized and well structured algorithm with all associated details to avoid getting lost in those long lines of 0-1 combinations.

Programming was an extremely time consuming activity as the computer required a rather primitive programming method based on perforated film reels. Sometimes it seemed that we were successful at last and the program was "moving", when the tape broke with a loud noise. Professor Warmus used to say in such circumstances that "it was three times lucky" and we had to glue the tape and put it again into the machine. Despite such difficulties Professor Warmus wrote and made operational dozens of programs in the internal code of the machine, which were later included in the library of programs for that computer. Indeed, it was in COPAN that a library of programs (using numerical methods) for the URAL-2 computer was completed and made available to other academic institutions, which used these computers, both at home and abroad.

The next available computer was the Danish made GIER. It used Algol programming language and was located in the Department of Numerical Methods at the University of Warsaw. Within the framework of institutional cooperation between COPAN and the University, we could book time on that machine to complete our commissioned work. Algol, in comparison to the internal code, was a tremendous leap forward. However, these were the very beginnings of programming, there were no books on the subject available to us and we did experience serious difficulties. We had to learn quickly from our own mistakes.

There was an urgent need to write a programming handbook for Algol. Professor Warmus immediately engaged in intensive efforts to write such a handbook and within a year we had, in COPAN, a very good Algol handbook. This was the best book on general programming, and on the Algol language in particular, which was

available at that time. It was important that it included many well-tested examples.

Professor Warmus was an outstanding lecturer as well as exceptional mentor, advisor and supervisor for his assistants. He conducted numerous lectures at the University of Warsaw. When I was employed by the University for a number of years, I ran tutorials to some of his lectures. It was the best cooperation one can imagine between an experienced lecturer and a young assistant. This view of mine has strengthened now after I have accumulated much more experience and value more such cooperation. My notes from those lectures were extremely helpful and still retain their validity. Even today, I keep discovering, how useful those well-worn notes from Professor Warmus's lectures can be in preparation of my own lectures.

Professor Warmus participated in the computer revolution during the last fifty years of his research activities. I know that before he reached his retirement age he got his own personal computer with very good programs. It must have been an emotional moment for Professor Warmus and I can understand the long-term plans he may have made. Unfortunately, his health gave.
This remarkable individual, so knowledgeable, so gifted and so industrious and motivated for hard work was knocked off his feet and permanently confined to his wheelchair. This must be extremely sad and difficult to accept, for his family, for his many friends and former students and collaborators. However, despite the odds, Professor Warmus has not lost his sense of humor; he is still cheerful and takes interest in the surrounding world.

Professor Warmus "produced" a sizeable group of disciples. He has inculcated in all his students and collaborators the need for solid, honest work and a very positive attitude to life. He published many papers, books and a significant library of programs.

Professor Warmus is A GREAT POLE, a man of profound faith and an eminent academic. His work achievements and an exemplary life deserve the highest respect and esteem.

Krystyna Styś

When presenting the "Warsaw" period of Professor Warmus's career, which coincided with the creation of the Computation Centre of PAN (COPAN), it must also be emphasized that, owing to his organizational skills and intuition, which allowed him to identify talented people, COPAN acquired a group of outstanding research and technical staff.

There were, among others:
Kazimierz Bałakier, Barbara Baran, Stanisława Bogumił, Maciej Dubejko, Piotr Dziekoński, Jadwiga Empacher, Marek Greniewski, Zbigniew Grzeszczyk, Bogdan Jasiński, Krystyna Jerzykiewicz, Maria Jurczakowska, Jerzy Kucharski, Joanna Malicka-Wasowska, Romuald Marczyński, Józef Maroński, Zbigniew Michejda, Barbara Muchlado-Marońska, Anna Nakończy, Lesław Niemczycki, Jacek Olszewski, ? Orłowska, Wojciech Pachelski, ? Palczewski, Tadeusz Palacz, Anna Raczko-Dębska, Jerzy Radzki, Andrzej Sadowski, Halina Siemieńczuk-Pielat, Ryszard Solich, E.Stolarska, Tadeusz Styś, Jerzy Szczepkowicz, Zenon Szoda, Danuta Szymańska-Kołodziej, Jadwiga Tarasiuk, Władysław Turski, Janusz Wasowski, Józef Wdowiak, ? Zdanowicz-Marońska, Krzysztof Ziółkowski, Zofia Zorychta, Krystian Zorychta.

These are only some of the names of the staff of the Computation Centre of PAN from its incipient years. Apart from those mentioned above, there were many others. All staff contributed to the scientific and research successes and achievements of COPAN.

Dr Andrzej Matuszewski was Professor Mieczysław Warmus's doctoral student.
Later in the sixties he was a researcher in COPAN Currently Dr Matuszewski works at the Institute of Computer Science of PAN (IPI PAN). In his recollections he reveals how very accurate, full of foresight and anticipation of future developments was the research work conducted by Professor Warmus.

Andrzej Matuszewski, 3 May 2002

A few thoughts about my teacher

I owe my…life to Professor Mieczysław Warmus (by the way, in my professional life there were other two eminent Mieczysławs; it seems that it is my lucky name…). Yes! He simply awakened a statistician in me. This particular area of science allowed me to live my life with a sense of fulfilment. This, however, is probably not that important in the big scheme of things. Thus, I would try to throw some light on other more important aspects of Professor Warmus's life.

Firstly, he was a disciple of Hugo Steinhaus, one of the most original Polish thinkers, which, in my view, is more than being an academic or an intellectual. Professor Steinhaus himself mentions Professor Warmus several times in his outstanding published memoires. This in itself is a considerable distinction.

Incidentally, thanks to the cooperation of the two Professors, I had the opportunity to participate in studies of a certain idea of Steinhaus relating to the evaluation of "quality". Unfortunately, as sometimes is the case with concepts of the most general nature, these studies have not been put to practice (yet,) despite the fact that they had been published.

Secondly, Professor Warmus frequently undertook tasks, which at that particular moment ran against prevailing attitudes and the so-called mainstream. This is the characteristic feature distinguishing very few academic minds. As much as it may now defy belief, (thanks to the Polish School of Mathematics), at the beginning of the sixties of the last century it was much safer politically to engage in highly valued theoretical mathematics than in informatics. Nevertheless, Professor Warmus was determined to take the risk, primarily because he was able to see the huge potential offered by computers. In hindsight, we know how accurate that intuition was. Incidentally, it would be quite interesting to establish Professor Steinhaus's attitude to, and understanding of, the importance of computers…

As Professor Warmus once confessed to me, his focus on computation technology there and then was "facilitated" by the circumstances at that time, when he had lost his job and the "personal configurations" were exceptionally unfavourable. Thus he had to create a job for himself by establishing a new Institute. It was going to be an Institute of PAN, built from the ground up. Consequently, he had to carry the burden of countless organisational responsibilities. He certainly found it difficult to gather around him an adequately skilled working team, which would meet general academic standards of PAN.

He had to rely, among others, on young graduates of the Faculty of Mathematics and Physics of the University of Warsaw, specialising in what was then called "Numerical Methods", who came from outside the capital. They were not always people easily moulded into future academics and researchers, and they often required a lot of attention and supervision…Nevertheless, many of them attained high professional qualifications and proved to be capable of achieving good scientific outcomes.

The Institute of Computer Science of PAN (IPI PAN), established by Professor Warmus, originally named CO PAN, continues its successful existence until the present day. Not long ago, the Institute celebrated its 40th birthday, at which Professor Warmus was fondly remembered as its founder.

In another stream of his "heroic" endeavours, Professor Warmus undertook a task worthy of his master Steinhaus; he decided to review the foundations of the theory of probability. It was a very controversial attempt as the issue was of such profound nature that the more mediocre-minded academics felt challenged and threatened.

It is a pity that Professor Warmus's active academic life has not been long enough to witness the current growing wave of research related to the teaching of the theory of probability and statistics. It is, however, obvious that his "lectures in statistics" were significant not only for the methodology of empirical sciences. His book related to the theory of matrices was a similar instance.

The establishment of cooperation with many non-mathematical sectors was the fourth, seemingly obvious and yet very risky enterprise. Professor Warmus's relationship with medicine, to which he devoted a lot of time and wholehearted commitment, is worth a closer examination. He understood this cooperation not only as a particularly difficult professional challenge but also as a very humane endeavour he owed to those who suffered. Sometimes, we have to look at ideas that have already come to fruition to appreciate the visionary nature of earlier thinking that brought them about.

Let us then have a closer look at the relations between informatics and statistics, which were Professors' main interests, and their practical applications in medicine. We are not talking here about standard tools such as Microsoft Office or classic databases, though they also play an important role in medicine.
Rather, it is about computer assisted diagnostic systems, which are constantly being developed and upgraded. Computer assisted methodology of teaching medicine is also rapidly developing. Of course, there is also statistics. For instance registers of pharmaceuticals require statistical procedures.
Now, it is only too obvious; forty years ago only the market demands and administrative orders mattered.

At present, to be published, all medical, scientific research has to include the description of the area of research and the description of properly conducted statistical analysis. As one of the consequences of that requirement, majority of hospitals employ high calibre statisticians. Considering the number of hospitals around the world, these statisticians created a 'new quality'. There are now conferences organised and books written on statistics in medicine.
This fact has certainly boosted the development of statistical software.

In the sixties and seventies of the last century, when computers and statistical methods were still in their nascent state, Professor Warmus already "anticipated" the above presented practical aspects of informatics and medical statistics. Professor Warmus's exceptional talents in these scientific disciplines predisposed him to senior positions in professional associations and on editorial boards of various scientific journals.

In 1965, Professor Mieczysław Warmus established close contacts with a group of medical scientists from the 1st Clinic of Internal Medicine in Łódź with a view to conducting cooperative research related to the application of mathematical methods in medicine. This is what Professor Tadeusz Bogdanik, the then director of that Clinic, wrote about his long and fruitful associations with Professor Warmus:

Professor Tadeusz Bogdanik
December 2001

Research work of Professor Mieczysław Warmus in applications of mathematics in medicine

Professor Warmus was deeply engaged and interested in various applications of mathematical methods in solving medical problems, both diagnostic as well as therapeutic. In this, he demonstrated exceptional ability to understand the complicated nature of medical issues and insightful approach to the analysis of all details. Professor Warmus's most interesting approach to therapy issues was his presumption that therapy must be based on bringing back to normal those parameters, which had undergone pathological change. A whole series of interesting papers on this subject followed. The total list of our cooperative publications amounts to forty two items, to which four more publications must be added, authored by Professor Warmus and my other professional colleagues.

Our cooperation, which - for me - was very important and inspirational, began in 1965. The first issue taken on board was the application of mathematical methods in differentiation of protein disorders. Protein studies were conducted by my wife, Professor Beata Bogdanik (items 30, 32, 33, 50, 55, 59, 76 on the list of Professor Warmus's publications). In the following years, Professor Warmus focused his interests on a wider range of issues related to diagnostic procedures in diabetes, employing unconventional methods of discrimination of sugar curves.

He also constructed spatial geometric model of sugar curves, which allowed for clear-sighted diagnosis in sugar disorders (items 34, 35, 36, 37, 53, 54, 56, 60, 61, 64 on the list of publications).

In the seventies, Professor Warmus took keen interest in the application of computer technology in controlling therapy by means of various derivatives of digitalis. To this end, Professor Warmus constructed interesting diagrams, which facilitated measuring dosages of digitalis (items 74, 75, 76, 78, 79, 84, 93, 95, 96, 99, 100, 101, 102, 103, 105, 106, 107, 108).

Professor Warmus was also keenly interested in the intractable issue of treating chronic, stagnant circulation problems and in the therapy based on derivates of

digitalis. In addition to the publications referred to above, there were further publications by Professor Warmus, which are listed below.

1. Bogdanik, T, Warmus M, Geraga W, Zambrzycki J: Zastosowanie nowej metody analizy korelacyjnej Warmusa w terapii pochodnymi naparstnicy (New method of Warmus's correlation analysis applied in therapy by digitalis derivatives). **The First International Conference in Poland „Computers in Medicine"** Wrocław, November 5-7, 1985.
2. Bogdanik T., Warmus M., Geraga W., Zambrzycki J.: Application of original „normal" regression for controlled digitalis therapy. **System-Modelling-Control. Proc. of The Fifth International Symposium.** Zakopane – Poland, October 6-12, 1986. Łódź, Pol. Cybernet. Soc., 1986, pp 12-15
3. Bogdanik T, Warmus M, Geraga W, Zambrzycki J: Praktyczne zastosowanie techniki komputerowej i nomogramów do kontroli terapii pochodnych naparstnicy (Practical application of digital technology and nomograms in controling therapy of digitalis derivatives) . **Pol. Arch. Med. Wew. (**Polish Archives of Internal Medicine), 1986, vol. 76, no 2, pp 80-88.
4. Warmus M, Bogdanik T, Geraga W, Zambrzycki J, Krzemińska-Pakula M: Modelowanie matematyczne w przewlekłej zastoinowej niewydolności krążenia (Mathematical modelling in chronic, stagnant circulation problems) Warszawa, **Instytut Podstaw Informatyki PAN (IPI PAN)**, 1986, 172 pages.

This last item published in 1986 by the Institute of Computer Science of PAN (IPI PAN), is a very broad publication. It presented mathematical methods in modelling diagnosis in chronic, stagnant circulation abnormalities. Apart from that, a large part of the publication focused on mathematical modelling in administering dosages of digitalis.
That publication crowned Professor Warmus's longstanding dedication to an intractable problem of clinical diagnostics in cardiology.

In the context of cardiology, Professor Warmus, and my colleague
Dr Zambrzycki, were involved in clear-sighted, epidemiological studies of arterial hypertension, introducing an entirely new criterion of hypertension used in epidemiological studies (items 80, 81, 82 in Professor Warmus's bibliography). Following that, Professor Warmus devoted his efforts to the construction of a computer program, for use in treatment of hypertension (items 86, 87).

In 1983, Professor Warmus directed his interest to the possibilities of the application of computer programs in initial diagnosis of cases of acute poisoning. Mr. Kaczmarek and Mr. Piaseczny, from Acute Poisoning Clinic in the Institute of Occupational Medicine in Łódź, were also involved in those studies. The work on

the subject of acute cases of poisoning also led to the creation of a special mathematical model of chelating mercury in acute poisoning. As this work is not included in the list of Professor Warmus's publications, I present it below:

Bogdanik T, Warmus M, Michalski J, Kordylasińska B, Bodenszac J: Model matematyczny chelatowania rtęci. **Problemy techniki w medycynie**, 1985, vol. 16, no 3, pp 190-199.

It was after Professor Warmus's departure from Poland that my professional colleagues and I utilised his method which was based on the assumption that therapy was based on bringing back to normal those parameters that had undergone pathological change. We applied it to the determination of dosages of bi-carbonate soda in the treatment of acute acidosis present in cases of poisoning. This method turned out to be very useful in a medically difficult process of determining dosages of alkalising substances in extremely acute cases of acidosis present in acute poisonings. Following are some published papers that utilised prof. Warmus's method in application to clinical toxicology:

- Rzepecki J., Bogdanik T.: *Zastosowanie oryginalnej metody analizy korelacyjnej Warmusa dla wyznaczania dawki wodorowęglanu sodu w ciężkiej kwasicy w ostrych zatruciach tlenkiem węgla*. **Stud. Mater. Monogr. IMP**, 1987, nr 26, str. 113-125.
- Rzepecki J., Bogdanik T.: *New original regression method for calculations of the adequate dosis of alkali in severe acidosis in acute poisonings*. **7-th International Symposium on System-Modelling-Control.** Zakopane, 17-21 V 93, t. 2, str. 149-154.
- Rzepecki J., Wojda A., Bogdanik T., Stasiak M.: *Matematyczny model dawkowania leków alkalizujących w ekstremalnie ciężkich kwasicach.* **III Krajowa Konferencja „Komputery w Medycynie".** Łódź, 23-24 czerwca 1994, t. 2, str. 192-198.
- Rzepecki J., Wojda A., Bogdanik T., Stasiak M.: *New regression method for calculation of the dosis of alkali in extreme severe acidosis caused by ethylene glycol poisoning*. **8-th International Symposium on System-Modelling-Control.** Zakopane, 1-5 V, 1995, t. 2, str. 207-212.
- Bogdanik T., Rzepecki J., Wojda A., Stasiak M.: *Nowy model matematyczny dawkowania alkaliów w ciężkiej kwasicy metabolicznej*. **IV Krajowa Konferencja: Modelowanie Systemów Biologicznych.** Kraków, czerwiec 2-3, 1995, str. 279-284.
- Bogdanik T.: *The mathematical model for designing of dosing regiments*. **Computers in Medicine. Polish Society of Medical Informatics.** Łódź, 1997, t. 1, str. 16-23.
- Bogdanik T., Wojda A., Rzepecki J., Stasiak M.: *New regression method for calculation of the dosis of alkali in extreme severe acidosis caused by methyl alcohol*. **Computers in Medicine. Polish Society of Medical Informatics.** Łódź, 1997, t. 1, str. 72-76.

For me personally, cooperation with Professor Warmus was extremely inspirational and the possibility of application of specific mathematical models in solving complicated diagnostic and therapeutic problems in medicine was very interesting. I will keep fond memories of my cooperation with Professor Warmus, which stretched over a period of almost twenty years.

Dr Jan Zambrzycki, who at that time belonged to the same group of medical scientists from the 1st Clinic of Internal Medicine in Łódź, in a letter to Mrs Helena Warmus wrote about his cooperation with Professor Warmus.

Dr. med. Jan Zambrzycki
E-mail: jzambrzycki@wppl
Sochaczew, 5 October 2002

Dear Madam,

Thank you very much for your letter about Professor Warmus and the request for some recollections relating to my contacts with the Professor. I have been told about the Professor's illness and I am extremely sad that he is so severely hampered in his physical and intellectual activities.
If I am permitted to convey to him my words of respect and my best wishes of a more complete rehabilitation, I would like to do it now.

Fulfilling your request, Madam, I am enclosing my recollections of my contacts with Professor Mieczysław Warmus.

I met Professor Warmus when I was employed as a senior assistant at the 1st Clinic of Internal Medicine, then under the directorship of Professor Tadeusz Bogdanik. My contacts with Professor Warmus continued after I completed my doctoral dissertation in 1976 and was re-employed as an assistant professor at the clinic. I was also a treasurer of the Medical Cybernetics Section of the Polish Internal Medicine Association.

After the change of the Clinic's director in 1978 and then on until 1980, Professor T. Bogdanik, S.Czechowicz, W.Geraga and myself continued to meet with Professor Warmus and work together on preparation of papers on collaborative clinical studies. Another venue of our meetings were symposia of the Medical Cybernetics

Section of the Polish Internal Medicine Association(TIP), organised by our team in close cooperation with Professor Warmus.

Professor Warmus devoted a lot of his time to me as a referee of my doctoral dissertation. The title of the dissertation "Multi-parameter analysis of an arterial hypertension in a selected sample of inhabitants of Łódź", as well as the range of data involved (over 30 variables in a group of 756 subjects) called for the utilisation of mathematical and computer methods. In those circumstances, Professor Warmus offered invaluable guidance and professional scrutiny. The time spent with Professor Warmus poring over and discussing the results of my work broadened my intellectual horizons and allowed me an opportunity to get to know Professor Warmus.

From the first moments of our acquaintance, Professor Warmus impressed me as someone who was well balanced in everyday life matters. It was as if his every move had been thought through and measured - his steps, his body language, and his head movement. His utterances were laconic and to the point. There were no rivers of words. This was in a strong contrast with the character of Professor Bogdanik, who was very spontaneous and spoke in a quick succession of tangled thoughts and spontaneous ideas.

I have always appreciated Professor Warmus's elegant style and directness of his approach. His respectful attitude to us, his junior colleagues by way of age, position, knowledge and experience, was particularly endearing.
In the course of our long meetings, we discussed ways of improving our approach to research material. We looked through prodigious amounts of emc printouts and discussed the sequence of steps and methods, which should be employed in our work.

During short breaks, Professor Warmus always found ways of injecting some lighter tones and amusing, laconic comments. In such moments his face was lightened up with a kind smile, sometimes expressing a boyish enjoyment of a good joke. Professor Warmus never offended anyone in our group with his criticism or jokes; he was the embodiment of tact and good manners.

In my view, Professor Warmus was always relentlessly logical, methodical and very matter-of-fact. In discussions with him, only reason and results mattered and not experience and beliefs, as often was the case in teams consisting of medical practitioners only.

My work on my doctoral thesis, assisted by Professor Warmus, included learning about the methodology of research, methods of evaluation of achieved results as well as learning how to pose and verify hypotheses.

My meetings with Professor Warmus mostly took place at the Clinic. Once, we met in his house in Warsaw and we also used to meet at the offices of the Computation Centre, PAN, where I collected rolls of printouts (from Odra-1204, as far as I remember). However, most meetings took place in Kudowa Zdrój, where Professor Warmus was spending the month of October of 1975. My director at the Clinic gave me permission to travel to Kudowa Zdrój and to spend some time with Professor Warmus. After several days of collaborative work, I was ready to start formulating conclusions of my doctoral research. Under the supervision of Professor Warmus, I was ready to develop the final version of the thesis. I recollect those days with great fondness. The opportunity to work with Professor Warmus was extremely rewarding and valuable and there, in Kudowa Zdrój, we were able to carry it without undue interruptions. In addition, the weather was beautiful and our short walks in the park were very enjoyable. At the end of my visit, Professor Warmus kindly saw me off to the railway station, accompanied me at a meal at a station restaurant and waited with me until the departure of my train.

Professor Warmus then offered me practical advice how to position myself on the platform to be one of the firsts of the waiting crowd to get onto the train. I successfully employed this method on many occasions. The idea is quite simple – you should behave differently from the rest of the crowd and should not stand close to the edge of the platform among the throng but move away as far as possible from the edge. It is necessary to judge where the moving carriage will come to a halt, which is better done from a longer distance, and then quickly walk up to the door. You will not necessarily be the first at the door but you would always be in the first four through the door with chance for a seat on the train.

As everyone tends to congregate at the edge of the platform, one does not have much competition in running up to the door while people in the crowd do get in each other's way. I think this is a very good example of the practical application of modelling to the problem of ensuring that you have a seat on an over-crowded train.

For me, time spent with Professor Warmus was creative and joyful despite the fact that our meetings sometimes lasted for many hours and at a time not always convenient for me. Those meetings were coordinated with Professor Warmus's scheduled visits in Łódź and occurred often without earlier notice. Under the influence of Professor Warmus, I arrived at a conviction that medical qualitative characteristics can be expressed in numbers, scaled, grouped and evaluated according to their diagnostic worth. I started to believe they can also be checked as to which one has the strongest links with the examined variable and which one is the easiest to determine and the most frequent. This knowledge allowed me to critically evaluate medical papers, articles and textbooks. It is a frequent practice in such

publications to lump together characteristics, which are important and unimportant, frequent and exceptional.

I also understood the nature of the orthogonalisation method of data analysis and ordering of characteristics from the point of view of their influence on studied variables. Professor Warmus also taught me how to look for what is left from the influence of successive characteristics after considering the influence of preceding characteristics. Thanks to Professor Warmus, my passion for calculations and good orientation in the world of numbers deepened and assumed many more shades and colours. My life as medical practitioner, researcher and as someone who would like to be perceived as a reasonable person, was significantly enriched by the knowledge, and particularly problem solving methodology, passed on to me by Professor Warmus.

I would like to convey to Professor Warmus my deepest and most sincere gratitude for all that.

Jan Zambrzycki
Presently Director of Internal Medicine
In District Hospital in Sochaczew

Mieczysław Warmus's cooperation with medical scientists resulted in a series of research publications. Many co-authors of those papers were the employees of the 1st Clinic of Internal Medicine in Łódź, at that time: T.Bogdanik, W. Geraga, J. Zambrzycki, S. Ciechowicz and B. Bogdanikowa, J. Wartak, J. Chlebowski, A.Woszczyk, J. Ciechowicz and others.

Professor Warmus also conducted scientific research related to the possible applications of mathematical methods and computer calculations in diagnosis of acute poisonings. Mr M.Kaczmarek and Mr M.Piaseczny, from the Clinic of Acute Poisoning in the Institute of Occupational Medicine in Łódź, were co-authors of a number of published scientific papers.

Several published research papers relating to the application of mathematical methods in the diagnosis and treatment of leukaemia were the result of Professor Warmus's cooperation with J.Aleksandrowicz, A.Kwiatkowski, J.Blicharski and T.Wolska - medical specialists and researchers from the Institute of Haematology of the Medical Academy in Kraków.

Professor Mieczysław Warmus also left an indelible mark of his outstanding personality at the Department of Mathematics at the University of Wollongong in Australia. This is reflected in the letter quoted below from Professors Martin Bunder and David Griffiths, from the Department of Mathematics, sent to Józef Łukaszewicz, Professor of the Wrocław University .

Date: Tue, 02 Apr 2002 11:18:57 +1100
From: Martin Bunder <mbunder@uow.edu.au>
Organization: University of Wollongong
To: dyrekcja@math.uni.wroc.pl
CC: griffd@uow.edu.au, tsiminska@ozemail.com.au
Subject: M J Warmus

Dear Professor Lukaszewicz,

Mieczyslaw Warmus (known here as John Warmus), was a Visiting Professor in the Department of Mathematics at the University of Wollongong from 1986 to 1990. He lectured to Honours students on Distibution Theory and contributed to our Staff Research Seminars, both as a speaker and as a discussant. He also joined in scholarly discussions and was involved in socially with individuals and small groups.

While at the University, he worked on a research monograph on Distribution Theory and another, probably more teaching oriented book, entitled Geometry of Matrices. The following were drafts of parts of these: "A generalised theory of operational calculus" University of Wollongong, Department of Mathematics Preprint No. 6/87 (134pp) "Geometry of Matrices Part 1: Introduction to m-dimensional analytic geometry" University of Wollongong, Department of Mathematics Preprint No. 4/88 (198pp). (If you do not have copies of these, I could send you photocopies.)

John Warmus was also a major influence in the University Catholic Society, holding regular meetings at his house.

We were honoured to have such a warm and distinguished mathematician in our midst and are pleased that you are preparing a publication in his honour.

Yours sincerely,
Martin Bunder (Chair, Faculty of Mathematics 1986, Dean
Faculty of Mathematical Sciences (later Informatics) 1989-1992)
David Griffiths (Head, Department of Mathematics 1989-1992)

The last sentence provides perhaps the best summary of Professor Warmus's personality.

Professor Jürgen Garloff from the University of Konstanz (Fachhochschule Konstanz, Germany), a mathematician in the field of interval arithmetics, met Professor Warmus in 1978 during a scientific conference in Austria. He was particularly interested in Professor Warmus's early pioneering studies related to that topic.

Professor Dr. Mieczyslaw Warmus
– an early pioneer of interval computations
by Jürgen Garloff

I had met Professor Warmus at the Interval Symposium which was held in Seefeld in Tyrol, Austria, May 16 – 19, 1978. I was impressed by his liveliness and originality and I am honored to put his work in a historical context, so far as it is concerned with interval computations.

Interval analysis is now a well-established tool for working with intervals and other domains, e.g., discs, which may represent uncertainty regions in which certain numbers can vary. These regions may stem from data uncertainties caused, e.g., by measurement errors, or from the strict treatment of rounding errors inherent in all digital computations. As a consequence, the result of a computation performed with interval arithmetic is ***guaranteed*** *to contain all results obtained from the related point problems computed with ordinary arithmetic - also in the presence of rounding errors. During the last four decades, approaches based on interval arithmetic were developed for many problems from applied and pure mathematics and other disciplines, numerous conferences have been organized and about 3000 publications on interval methods have appeared.*

It is commonly accepted that the monograph by Ramon E. Moore entitled ***Interval Analysis****, Prentice-Hall, Englewood Cliffs, N. J., 1966, was the starting point of the development of interval methods. Indeed, the impact of this book cannot be overstated. It is, however, far less known that two pioneers had worked on this field before Ramon E. Moore came on stage:*

The Japanese mathematician T. Sunaga with his paper from 1958 and independently M. Warmus who had published in 1956 his fundamental paper

> *Calculus of Approximations*
> ***Bulletin de l'Académie Polonaise des Sciences***
> *Cl. III, vol. IV, no. 5, pp. 253 – 259, 1956.*

In this work, Professor Warmus defines the basic operations of interval arithmetic

and deduces some properties. Throughout he uses the equivalent representation of an interval by its midpoint and radius. He notices that subtraction of intervals is not the inverse operation of addition and division not the inverse of multiplication and that the distributive law does not hold. This leads him to introduce the ***orientation*** *of intervals: An interval [a,b] is positively oriented if* $a \le b$ *and negatively oriented if* $a \ge b$*. The set of the positively and negatively oriented intervals forms the set of the* ***approximate numbers****. Professor Warmus studies the algebraic properties of this set and introduces a norm and convergence thereupon. Also, he extends the concept of approximate numbers to approximate* ***functions*** *and introduces convergence, continuity, and the derivative and integral of such a function.*

In his follow-up paper

> *Approximation and Inequalities in the Calculus of Approximations, Classification of Approximate Numbers*
> ***Bulletin de l'Académie Polonaise des Sciences***
> *Série des sciences math., astr. et phys. vol. 9, no. 4, pp. 241 – 245, 1961 ;*

he considers operations which retain the inequalities between approximate numbers.

Professor Warmus considers intervals with the background of rounding errors. He was aware of the big potential of interval computations: ***"All the numerical methods and computations can be written in the language of this theory; many new methods arise; many cumbersome computations can be performed automatically."*** *However, he sees that* ***"there are many numerical problems which cannot be formulated properly, because this theory fails."*** *He mentions that he has elaborated the details of the theory and that he is preparing a monograph. Unfortunately, this book was never published.*

July, 2003

Academic life's work

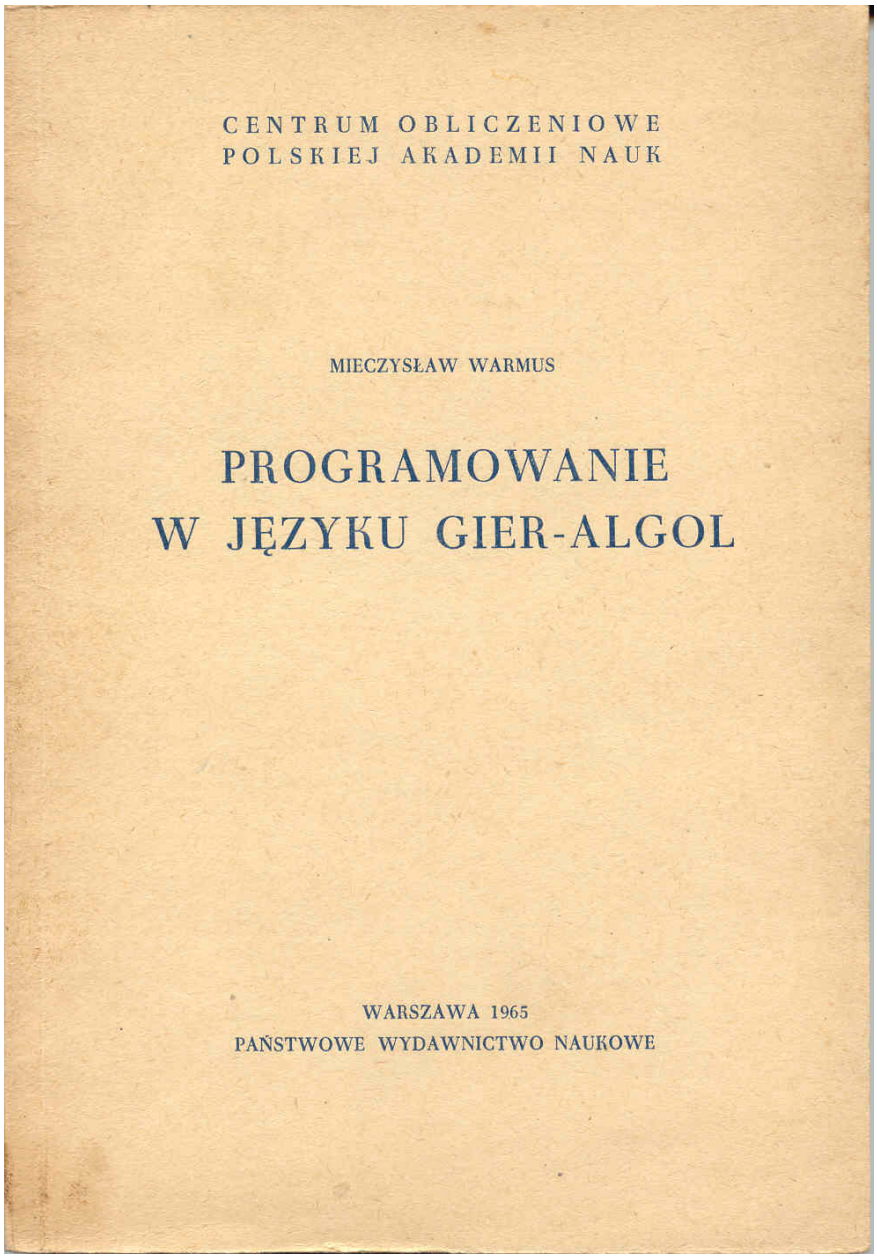
Professor Warmus's own catalogue of his work includes all publications from the very beginning of his research work in 1946 until the 31st of December 1983. Thanks to the information supplied by his co-authors, this catalogue can now be supplemented by a number of later publications. It also contains four further scientific papers, which appeared as preprints published by the University of Wollongong in the years 1986-1989.
This catalogue contains one hundred and seventeen items and illustrates well the achievement of forty-four years, which Mieczysław Warmus devoted to research. The titles of these publications indicate a wide range of interests, the fact so often emphasised by his students, colleagues and co-authors in recollections of their work with Professor Warmus.
He was fluent in English, French, German and Russian and he wrote and published papers in these languages. They appeared in many foreign professional journals.

Professor Warmus's academic career closely followed his research interests, which were largely influenced by the Wrocław University milieu and by working with mathematicians of such calibre as Hugo Steinhaus, Edward Marczewski, Bronisław Knaster and Władysław Ślebodziński. This created an appropriate climate and provided inspiration for the development of M. Warmus's research potential.

Mieczysław Warmus was one of four researchers, and the only mathematician amongst them who, in the beginning of 1948, participated in the first seminar devoted to computing machines in Poland. While the others engaged in the efforts to build the first Polish computer, Mieczysław Warmus directed his attention to numerical methods and the so called "applied mathematics" or applications of mathematics in solving intractable problems in various scientific disciplines.

In the middle of the fifties, at the Wrocław University, he conducted a seminar *Numerical and graphic methods*, where participants presented results of their own research and studied available literature on building and programming digital computers. Thanks to his initiative, the first Polish textbook devoted to numerical and graphic methods was written and published. It was a monograph co-authored with Józef Łukaszewicz entitled *Numerical and graphic methods*, PWN, Warsaw, 1956 [item 23].
In 1957, Professor Władysław Ślebodziński mentioned Mieczysław Warmus as the first, and thus far, the only Polish mathematician, whose main thrust of research interests was directed at applied mathematics. In 1958, in the personal dossier attached to his professorial dissertation (praca habilitacyjna) in the Polish Academy of Sciences, Mieczysław Warmus was described as the only Polish specialist in numerical and graphic methods.

Amongst his published works, there are several textbooks. In many cases these were the first and the only available textbooks on the subject in Poland at that time. One of the examples is a book entitled *Programowanie w języku GIER-ALGOL* (Programming in the GIER-ALGOL language) [item 45], published in early 1965.



Document 46. Title page of the textbook

PRZEDMOWA

Niniejszy podręcznik Gier-Algolu powstał na podstawie wykładów, jakie w roku 1964 prowadziłem na Politechnice Warszawskiej i w Centrum Obliczeniowym PAN. Ponieważ istniejące książki i opracowania dotyczące Algolu ani pod względem zakresu materiału, ani pod względem dydaktycznym nie wystarczają dla pełnego wprowadzenia czytelnika w programowanie w języku GIER-ALGOL, zdecydowałem się na napisanie nowego opracowania, tym bardziej że sporządzenie translatora języka GIER-ALGOL dla maszyny Ural-2 rozszerza możliwości stosowania tego języka poza maszynami typu Gier, a tym samym rozszerza krąg użytkowników tego języka.

Kierując się względami dydaktycznymi, starałem się wykład ilustrować licznymi przykładami i zadaniami, z których część wziąłem ze znanych publikacji:

1) J. W. Backus i inni, "Revised Report on the Algorithmic Language Algol 60", edited by Peter Naur, Numerische Mathematik 4, 420-453 (1963),

2) Peter Naur, "A course of Algol 60 programming", Regnecentralen, Copenhagen 1962,

3) Henning Christensen i inni, "A Manual of GIER ALGOL III", edited by Peter Naur, Regnecentralen, Copenhagen, 1964,

4) Helge Vilstrup, "An ALGOL training manual", Regnecentralen, Copenhagen, 1963.

Mieczysław Warmus

Warszawa, październik 1964 r.

Document 47. Preface

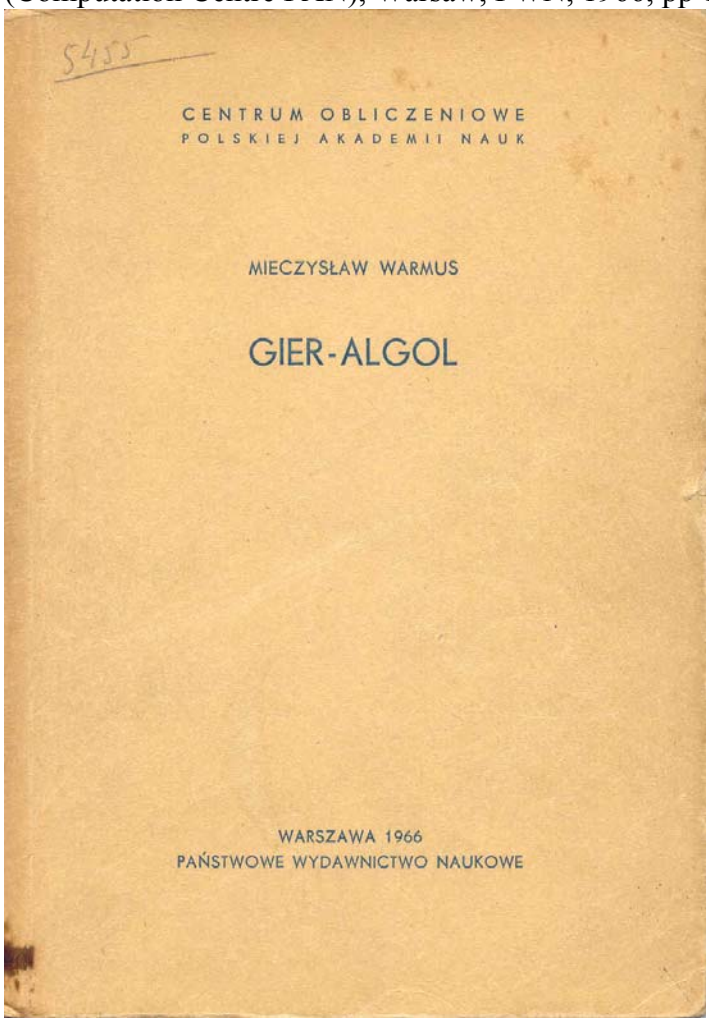
In the preface to this textbook, its author wrote:

This textbook of GIER-ALGOL came into being on the basis of lectures, which I conducted in 1964 in the Warsaw Polytechnic and in the Computation Centre of PAN. As the existing books and studies on Algol, neither from the point of view of the material nor from the point of view of their teaching suitability, were sufficient to introduce readers into programming in the GIER-ALGOL language, I decided to prepare a new study.

Another reason was that the creation of the translator of the GIER-ALGOL language for the Ural-2 computer widens the applicability of this language well beyond –GIER type computers and by the same token it widens the circle of its potential users.
Keeping in mind teaching purpose, I endeavoured to illustrate the exposition of material with numerous examples and problems, many of which I sourced from well-known publications: (publications, as listed in the Document 47)

Mieczysław Warmus
Warsaw, October 1964

This textbook was soon followed by another, entitled *GIER-ALGOL*, COPAN (Computation Centre PAN), Warsaw, PWN, 1966, pp 1-268 [item 46].



Document 48. Title page of *GIER-ALGOL*

The introduction to this textbook merits special attention as it explains the circumstances, which led to its writing.

PRZEDMOWA

Niniejszy podręcznik GIER-ALGOLu powstał ze skryptu pod podobnym tytułem, wydanego w 1965 r. przez Centrum Obliczeniowe Polskiej Akademii Nauk i Państwowe Wydawnictwo Naukowe. W porównaniu ze skryptem niniejsze opracowanie zawiera znacznie więcej zadań i przykładów, wykład został w wielu miejscach uzupełniony lub poprawiony, ponadto usunięto różnego typu drobne usterki i niedopatrzenia.

Wspomniany skrypt był pierwszym oryginalnym polskim opracowaniem języka ALGOL, jakie ukazało się na rynku księgarskim. Wkrótce po nim wydano jeszcze dwie książki:

1. Stefan Paszkowski: Język ALGOL-60, Państwowe Wydawnictwo Naukowe, Warszawa 1965.
2. Jan Madey; ALGOL-60 - GIERALGOL III, Wydawnictwa Uniwersytetu Warszawskiego, 1965.

Obie wspomniane publikacje różnią się od tego podręcznika bardzo wyraźnie zarówno układem treści, jak i metodą wykładu. Posługują się one m.in. tzw. metajęzykiem, który dla niematematyków jest najczęściej trudny. Dlatego też wspomniane wyżej książki są przeznaczone głównie dla czytelników oswojonych z matematycznym sposobem myślenia. Niniejsze opracowanie ma na celu uprzystępnić programowanie w języku ALGOL szerokim rzeszom czytelników o wykształceniu technicznym, ekonomicznym, przyrodniczym czy humanistycznym, poprzez maksymalne uproszczenie wykładu, niewnikanie w subtelności natury logicznej, nie mające znaczenia dla praktyki obliczeniowej, wreszcie staranny dobór przykładów i zadań.

Książka niniejsza obejmuje pełny wykład języka ALGOL-60, a ponadto cały dodatkowy materiał potrzebny do praktycznego programowania w języku GIER-ALGOL na maszynach typu GIER. Sporządzenie translatora tego języka dla maszyn typu URAL-2 rozszerza znacznie krąg jego użytkowników.

Tak jak poprzedni skrypt, książka niniejsza oparta jest na dwu podstawowych publikacjach:

1. J.W. Backus, F.L. Bauer i inni: Revised Report on the Algorithmic Language ALGOL-60. Regnecentralen, Copenhagen 1962.
2. H. Christensen, G. Ehrling i inni: A Manual of GIER ALGOL III. Regnecentralen, Copenhagen 1964.

Język GIER-ALGOL jest jedną z najobszerniejszych reprezentacji języka ALGOL-60. Do istotnych różnic należą:

- w języku GIER-ALGOL nie ma deklaracji own array,
- liczby naturalne nie mogą być w języku GIER-ALGOL etykietami,
- wszystkie parametry formalne w procedurach GIER-ALGOLu muszą być specyfikowane,
- w procedurach GIER-ALGOLu nie można wywoływać tablic przez wartość,
- GIER-ALGOL zawiera około 30 procedur standardowych (głównie procedury wejścia i wyjścia), których nie ma w ALGOLu, ponieważ ALGOL-60 pozostawił wprowadzanie danych i wyprowadzanie wyników jako sprawy otwarte.

Pozostałe różnice dotyczą szczegółów mniej istotnych. W tekście książki różnice między GIER-ALGOLem a ALGOLem-60 są szczegółowo wymieniane.

Składam podziękowanie Państwowemu Wydawnictwu Naukowemu za staranne wydanie niniejszej książki.

Warszawa, wrzesień 1965 r. *Mieczysław Warmus*

Document 49. Preface

Preface

This textbook of GIER-ALGOL is based on a student handbook under a similar title, published in 1965 by the Computation Centre PAN and Państwowe Wydawnictwo Naukowe (State Scientific Publishers). In comparison with the student handbook this study contains many more problems and examples, the exposition of material is supplemented and amended in many places and various errors and omissions have been removed.
The above mentioned student handbook was the first Polish original study of the ALGOL language, which appeared on the market. It was soon followed by two other books:

1. *Stefan Paszkowski: 'Język ALGOL-60' (ALGOL-60 language), Państwowe Wydawnictwo Naukowe (State Scientific Publishers), Warsaw 1965*
2. *Jan Madey, 'ALGOL-60 – GIERALGOL III', Wydawnictwa Universytetu Warszawskiego (University of Warsaw Publications), 1965.*

Both of these publications differ from this textbook by the arrangement of material as well as the method of its presentation. Those books make frequent use of the so-called meta-language, which is rather difficult to understand for a non-mathematician. This is why the two above mentioned books are addressed mostly to readers who are familiar with mathematical way of thinking. The aim of this textbook is to make programming in the ALGOL language more accessible to wider circles of readers, irrespective of their tertiary training, which may well be technical, economic, scientific or humanist. I tried to achieve this by radical simplification of the presentation of material, by excluding unnecessary references to mathematical logic where it was not important in computational practice, and by a very careful choice of examples and problems.

This textbook includes a full course of the ALGOL-60 language as well as supplementary material required for practical programming in the GIER-ALGOL language on GIER-type computers. The creation of the translator of the GIER-ALGOL language for the Ural-2 computer widens the circle of its potential users.
As the preceding script, this study is based on two fundamental publications:

1. *J.W. Backus, F.L. Bauer and others: Revised Report on the Algorithmic Language ALGOL-60. Regnecentralen, Copenhagen 1962.*
2. *H. Christensen, G.Ehrling and others: A Manual of GIER ALGOL III. Regnecentralen, Copenhagen 1964.*

GIER-ALGOL is one of the broadest representations of the ALGOL-60 language. Following are the only important differences:

- *in the language GIER-ALGOL there are no declaration 'own array";*
- *natural numbers can not be 'labels' in GIER-ALGOL;*

- *all formal parameters in GIER-ALGOL procedures, need to have specifications;*
- *in GIER-ALGOL procedures, tables can not be called by a value;*
- *GIER-ALGOL includes approximately 30 standard procedures (mainly input and output procedures) that do not appear in ALGOL. ALGOL-60 left the problem of data input and output, as an open problem*

Other differences concern less important matters. The differences between GIER-ALGOL and ALGOL-60 are highlighted in this publication

I would like to express my gratitude to The State Scientific Publishers for all the care that has gone into the publication of this book.

Mieczysław Warmus
Warsaw, September 1965

The author clearly emphasized that the textbook was not exclusively aimed at mathematicians. The method of presentation and the simplicity of language used were intended to facilitate the access for a wide range of readers.

Another textbook written by Mieczysław Warmus, entitled *Wektory i Macierze (Vectors and Matrices)*, PWN Warsaw, 1982 [item 91], still features in the reading list in linear algebra as a recommended reading for the students of Łódź University (http://www.uni.lodz.pl/ulan/socrtd.html).

In the mid sixties Mieczysław Warmus established close links with medical scientists. His particular interest in the application of mathematical methods in medicine bore fruit in the form of 61 publications. This research work conducted over a period of some 20 years is very wide-ranging. His mathematical models were later used in further research studies conducted by other researchers after his departure from Poland. These publications were presented by Professor Tadeusz Bogdanik in his recollection of Professor Mieczysław Warmus in the previous chapter of this book. They are also mentioned by Dr Andrzej Matuszewski, Professor Warmus's student and collaborator.

Some of Professor Warmus's early work involved mathematical concepts previously unknown or languishing on the peripheries of interests of his contemporaries. In hindsight, all his publications boldly pointed to the dawning of the age of computers. They are referred to and quoted in many professional mathematical publications.

Eric W. Weisstein in his *Apollonius Pursuit Problem*, **Wolfram Research, Inc.** (mathworld.wolfram.com) mentions M. Warmus's work *Un Théorème sur la poursuite* (1946) [item 1]. The same author refers to two more works of M. Warmus:

Evaluation des differences entre l'aire des regiones planes et le nombre des points aux coordonnees entières couverte par elles (1947) [item 3], and *A Supplementary Note on the Irregularities of Distributions* (1976) [item 71].

However, two of Professor Warmus's works: *Calculus of Approximations* (1956) [item 20] and *Approximations and Inequalities in the Calculus of Approximations. Classification of Approximate Numbers* (1961) [item 27], are by far the most frequently quoted and discussed books. They are quoted in various academic publications and in the popular professional Internet sites. They are also quoted by *Editorial – Granular Computing*, **Archives of Control Sciences** (http://www.dcm.ntu.ac.uk/RTTS/Projects/g-comp/ACS-editotial.pdf), *Directed Interval Arithmetic* (http://www.math.bas.bg/~epopowa/dircted.html), *Early Papers on Interval Computations* (http://www.cs.utep.edu/interval-comp/early.html), Z. Kulpa, A. Pownuk and I. Skalna *Analysis of linear mechanical structures with uncertainties by means of interval methods*, **Computer Assisted Mechanics and Engineering Sciences** PAN 1998, and in *Interval analysis and computation* (http://www.ippt.gov.pl/zkulpa/guaphys/interval.html).

All the above mentioned sources agree in their views that Mieczysław Warmus's work was new and innovative and introduced entirely new concepts into the subject matter under consideration.

His life's work consists of more than just 117 publications. It significance lies in laying foundations and subsequent promotion of applied mathematics in Polish science.

His academic legacy includes great numbers of young adepts whom he succeeded to convince that mathematics was not just dead formulas, but living, thriving science, which should be properly utilized for the benefit of humankind.

The recollections of Professor Warmus's students, doctoral students, collaborators and co-authors presented in the previous chapter of this book are the impressive testimony to the enduring value of the Professor' s academic life's work. They require no further comment of any kind.

Mieczysław Warmus:
The list of publications

1. M.Warmus. *Un theorème sur la poursuite*. **Comptes-Rendus de la Societe Polonaise de Mathematique,** XIX, 1946, str. 233
2. Steinhaus,H. et Warmus,M. *Quelques theorèmes sur les jeux.* **Comptes-Rendus de la Societe Polonaise de Mathematique**, XIX, 1946, str. 233
3. M.Warmus. *Evaluation des differences entre l'aire des regions planes et le nombre des points aux coordonnees entièree couverte par elles.* **Colloquium Mathematicum** I.1, Wrocław 1947, str. 45-46
4. M.Warmus. *Sur un problème concernant les reseaux plans.* **Colloquium Mathematicum** I.1, Wrocław 1947, str. 49
5. M.Warmus. *Sur la construction des tables de fonctions à grand nombre de chiffres*. **Colloquium Mathematicum** I.3, Wrocław 1948, str. 248-249
6. M.Warmus. *O pewnym algorytmie*. **Matematyka** Nr 1, 1948, str. 16-18 i Nr 2 str. 9-12
7. M.Warmus. *O obliczaniu pól obszarów płaskich za pomocą siatek równoległobocznych.* **Sprawozdanie ze wspólnego: 7-go Zjazdu Polskich Matematyków** i **3-go Zjazdu Czechosłowackich Matematyków.** Prirodovedeckie Nakladatelstvi, Praha 1949, str. 309-310
8. M.Warmus. *O obliczaniu wielocyfrowych tablic logarytmicznych i 36-cyfrowe tablice logarytmów naturalnych.* **Prace Wrocławskiego Towarzystwa Naukowego,** Seria B, Nr 51, PWN Wrocław 1953, str. 1-84 /Nakład 1000+200 egz./
9. M.Warmus. *O pewnej metodzie numeryczno-graficznej ilustrowanej przykładem z kinematyki silników w układzie V i gwiazdowych.* **Zastosowania Matematyki** II.1, 1954, str. 67-82
10. S.Drobot and M.Warmus. *Dimensional Analysis in sampling inspection of merchendise.* **Rozprawy Matematyczne** V, Warszawa, PWN 1954, str. 1-54
11. M.Warmus. *Sur l'evaluation des tables de logarithmes et tables des logarithmes naturels à 36 decimales.* **Prace Wrocławskiego Towarzystwa Naukowego**, Seria B Nr 52, PWN Wrocław 1954, str. 1-94 /Nakład 1230 egz./
12. S.Drobot i M.Warmus. *Analiza wymiarowa w badaniu wyrywkowym towarów.* **Zastosowania Matematyki** II.1 1954, str. 1-33
13. M.Warmus. *Rachunek przybliżony w zakresie pomiarów technicznych i wynikających z nich błędów.* **Przegląd Elektroniczny** Rok XXXI, Zesz.10/11, 1955, str. 748-752
14. M.Warmus. *O obliczaniu pól obszarów płaskich siatkami równoległobocznymi.* **Prace Wrocławskiego Towarzystwa Naukowego**, Seria B Nr 27, Wrocław PWN 1955, str. 1-60 /Nakład 1195 egz./

15. M.Warmus. *Sur le calcul operatoire des fonctions de plusiers variables.* **Colloquium Mathematicum** III.2, Wrocław 1955, str. 186-188
16. M.Warmus. *Solution du problème de J.Mycielski.* **Colloquium Mathematicum** III.2, 1955, Wrocław, str. 203-205
17. M.Warmus. *Solution du problème de J.Mycielski.* **Prace Matematyczne** I.1, Warszawa 1955, str. 197-198
18. M.Warmus. *Un nomogramme à grande exactitude et une methode d'approximation modifiee.* **Colloquium Mathematicum** III.2, Wrocław 1955, str. 206-208
19. M.Warmus. *Približennyje wyczislenija.* **Biulleten Polskoj Akademii Nauk** Otd.III, Tom IV, No 5, 1956, str. 249-254
20. M.Warmus. *Calculus of Approximation.* **Bulletin de l'Academie Polonaise des Sciences** C1.III, Vol.IV No 3, 1956, str. 253-259
21. S.Paszkowski i M.Warmus. *O pewnej metodzie matematycznej w antropologii.* **Przegląd Antropologiczny** t.XXII, Wrocław 1956, str. 627-650
22. M.Warmus. *Nomographic functions.* **Rozprawy Matematyczne** XVI, Warszawa PWN 1959, str. 1-152
23. J.Łukaszewicz i M.Warmus. *Metody numeryczne i graficzne.* **Biblioteka Matematyczna** XII, PWN Warszawa 1956, str. 1-430 /Nakład 3000 egz./
24. M.Warmus. *Floating-Point Arithmetic for Digital Computers.* **Instytut Badań Jądrowych**, Report No 187/XII, Warsaw 1960, str. 1-5
25. M.Warmus. *Rozwiązywanie numeryczne równań trzeciego i czwartego stopnia o współczynnikach rzeczywistych.* **Zastosowania Matematyki** VI, Warszawa 1961, str. 127-135
26. M.Warmus. *Transformed Point Arithmetic for Digital Computers* **Bulletin de l'Academie Polonaise des Sciences.** Serie des sciences math., astr. et phys. Vol.IX, No 4, 1961, str. 237-239
27. M.Warmus. *Approximations and Inequalities in the Calculus of Approximations. Classification of Approximate Numbers.* **Bulletin de l'Academie Polonaise des Sciences.** Serie des sciences math., astr. et phys. Vol.IX, No 4 1961, str. 241-245
28. M.Warmus. *O wskaźnikach względnej efektywności.* **Zagadnienia Ekonomiki Rolnej** 4, 1965, str. 59-69
29. M.Warmus. *O całkowaniu numerycznym.* **Centrum Obliczeniowe PAN**. Warszawa PWN 1965, str. 1-24 /Nakład 500+100 egz./
30. T.Bogdanik, B.Bogdanikowa, M.Warmus, J.Wartak. *Zastosowanie metod matematycznych do różnicowania typów dysproteinemii.* Praca zbiorowa: *Zastosowanie metod matematycznych w medycynie.* **Ośrodek Kształcenia i Doskonalenia Kadr Naukowych PAN**, Ossolineum 1966, str. 75-91
31. M.Warmus, J.Wartak. *Analysis of Elektrocardiograms by Means of an Electronic Digital Computer.* **Bulletin de l'Academie Polonaise des Sciences**, Serie des sciences techniques, Vol.XIV, No 8, 1966, str. 113-119

32. T.Bogdanik, B.Bogdanikowa, M.Warmus, J.Wartak. *Mathematical Differentiation of Dysproteinemias.* **Actes du IVme Congres International de Medecine Cybernetique**, Nice 1966, str. 373-376
33. T.Bogdanik, B.Bogdanikowa, M.Warmus, J.Wartak. *Różnicowanie typów dysproteinemii za pomocą metod matematycznych.* **Polskie Archiwum Medycyny Wewnętrznej** XXXVI, 1966, 6, str. 735-741
34. J.Chlebowski, M.Warmus, J.Rostafińska, A.Wasilewska, J.Wartak, T.Bogdanik. *Dyskryminacja matematyczna krzywych cukrowych w otyłości, nadciśnieniu i zawale serca.* **Polskie Archiwum Medycyny Wewnętrznej** XXXIX, 1967, 2/8/, str. 143-150
35. T.Bogdanik, M.Warmus, J.Wartak. *Praktyczne zastosowanie modeli matematycznych do różnicowania typów cukrzycy.* **Polskie Archiwum Medycyny Wewnętrznej** XXXIX, 1967, 2/8/, str. 123-130
36. M.Warmus, J.Wartak, T.Bogdanik. *Matematyczny model krzywej cukrowej.* **Polskie Archiwum Medycyny Wewnętrznej** XXXIX, 1967, 2/8/, str. 211-217
37. J.Wartak, J.Chlebowski, M.Warmus, C.Ziętkowska, B.Ziętkowski, T.Bogdanik. *Matematyczna ocena krzywych cukrowych po stosowaniu chlorotiazydu.* **Polskie Archiwum Medycyny Wewnętrznej** XXXIX, 1967, 2/8/, str. 219-227
38. M.Warmus, J.Wartak. *Rozpoznawanie elektrokardiogramów za pomocą elektronicznej maszyny cyfrowej.* **Kardiologia Polska** X, Nr 1, 1967, str.1-9
39. M.Warmus. *Razliczni problemi na optimiziraneto.* **Fiziko-Matematiczesko Spisanie**, tom 10/43/, Kn.2, Błgarska Akademija na Naukite, 1967, str. 118-122
40. K.Styś, M.Warmus, J.Wartak. *Standardowa metoda diagnostyczna* **Centrum Obliczeniowe PAN**, PWN Warszawa, 1967, str. 55-84
41. M.Warmus. *Tables of elementary functions.* **Pergamon-Press N.York-Oxford-London-Paris** i PWN Warszawa 1960, str. 1-570. Nakład 6500+150 egz.
42. M.Warmus. *Tables of Lagrange Coefficients for Cubic Interpolation.* Tom I i II **PWN Warszawa** 1965, tom I str. 1-502, tom II str. 1-502. Nakład 1000+130 egz.
43. M.Warmus. *Tables of Lagrange Coefficients for Cubic Interpolation.* **PWN Warszawa** 1966, Str. 1-502. Nakład 700+130 egz.
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