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An Unbiased View of the History of Polish Medical Physics by a Senior Polish Medical Physicist

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Here is a story told by Maria Skłodowska-Curie at the meeting of the International Committee of Intellectual Cooperation in 1921: "In a free literary competition on the role and importance of elephants the Englishman's story was «My adventures while shooting elephants in South Africa», the Frenchman was more concerned with «The sexual and erotic life of elephants», while the Polish approach was invariably «The elephant versus Poland's national independence»", which seemed quite understandable in the light of over 120 years when Poland was partitioned and lost its independence. Since then this saying has become proverbial and came to express the unmistakably Polish tendency to see everything in terms of Polish interests.

In my remarks and reminiscences on the history of the Polish Society of Medical Physics you will quickly recognize the same tendency...

First, I will, among other things, try to open some old cupboards to "produce good [things] from the store of good" (Matthew 12:35), especially concerning the first few years of the activity in medical physics in Poland, and second, I will draw some conclusions and/or offer suggestions based on what a senior medical physicist has seen for more than 50 years of his activity in this field.

I have always wondered what medicine was like in Russia, and consequently on Polish territories partitioned by Tsarist Russia, in those years between 1840 and 1860 at a time when my great-grandfather was a senior physician in the Russian army.



Couldn't we find any attempt among medical profession at that time and at that place that aimed at combining medicine with physics or chemistry? In one of the old book stores I came across an intriguing book *Fizyka lekarska* — *Die Physik in der Medizin*, written by Hoh Theodor, published in Stuttgart 1875 and translated by Dr Aleksander Fabian from Dąbrowa Górnicza, published and printed by Drukarnia Gazety Lekarskiej (Medical Gazette Printing House) in Warszawa in 1880.

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Here we have a very interesting approach to medicine from the physics and chemistry points of view. Except for some outdated notions such as floriston, and many others which sound quite incomprehensible to us today, the general tone is in agreement with that of the statement found on the first pages of the book, a statement that sounds very familiar and may easily be accepted in our textbooks:

"§2. There seem to be so many-sided, extensive and important applications in

medicine that a general, as it were, review of the most important points of view cannot at first sight provide knowledge of all the range and depth of this scientific domain."

§ 2. Co się tycze zastosowania fizyki w medycynie w szczególności, to jest ono tak wielostronném, bogatém i doniosłém, że ogólny, że tak powiem, powierzchowny przegląd, najważniejszych punktów widzenia, nie może odrazu dać poznać caléj rozległości i głębokości objętéj tu naukowéj niwy.

Now let's make a jump 100 years later, i.e. to 1957, when I started my career in medical physics after quitting a research position in solid state physics at Warsaw University.

Poland became then politically more tolerant due to some degree of relaxation of the grip on science, arts and social life, adopted by the new Communist leader, Mr. Gomółka. The international atmosphere also became less tense although the 'Cold War' doctrine was still binding.

The situation of Poland's physicists and bioengineers vis-à-vis medicine was at that time perhaps specific. Let me just describe it in a rather simplified way.

There was a national (Elephant again!) M. Skłodowska-Curie's legacy to Polish physicists, successfully promoted at the Institute of Oncology in Warsaw, and there was also a strong group of bioengineers, or medical engineers graduated from Warsaw Technical University.

These two groups had never been in any way competitive, on the contrary, they were linked by many personal and professional ties, this being the most fundamental reason why Polish medical physics started comparatively early and quickly developed.

Graduated from Warsaw Technical University ('engineers'), students of Prof. C. Pawłowski and his successors, were most instrumental in developing radiotherapy and radioisotope methods at the Institute of Oncology in Warsaw and elsewhere, and University physics graduates ('physicists') were employed, e.g. at some dozen Medical Academies and other institutions concerned with health care or biophysics.

It was at that time that the International Organization of Medical Physics (IOMP) was founded in 1964 with the following objectives:

- to organize international co-operation in medical physics and to promote communication between the various branches of medical physics and allied subjects,
- to contribute to the advancement of medical physics in all its aspects, and
- to advise on the formation of National Committees of Medical Physics in those countries which lack such organization.

As Professor John Mallard writes in his history of IOMP:

"IOMP began unofficially in January 1963 with its four stalwart supporters: UK, USA, Sweden and Canada. At one stage (i.e. in 1965) I was writing to about 19 different countries, each one at different stages of development. I still find it surprising that the countries behind the Iron Curtain were so keen: East Germany was in before West; and Hungary and Poland, in spite of all their difficulties, were in the first batch of new elections."

In this situation, the appeal to the medical physics community in Poland from the IOMP to establish a National Medical Physics Organization and join IOMP, found a very positive response.

The foundation of the Polish Society of Medical Physics (PSMP) was a result of combined efforts of several medical physicists and bioengineers, with the following consequences: The Founding Meeting of the Society was held on February 5, 1965 in Warsaw, which subsequently led to the First General Assembly Meeting on September 30 where it was officially announced that, as a result of the participation of the Polish delegation at the first Congress of IOMP on 8th–10th September 1965 in Harrogate, England, PSMP was admitted to the IOMP as one of the first 10 national member organizations in Canada, Sweden, UK, USA, East Germany, Hungary, Israel, Poland, and South Africa.

The First Executive Board of the PSMP elected a President — Prof. Dawid Shugar

(1915–) who was born in Poland, studied and worked until 1952 in Canada. Then Professor of Biophysics at Warsaw University, headed the Molecular Biology Department of the Institute of Biochemistry and Biophysics; he was a member of the Polish Academy of Sciences and author of more than 500 research papers. He also initiated application of physics to molecular processes in living organisms and fluorescent spectroscopy to the kinetics of enzymatic processes and mechanisms



of intermolecular interactions. His idea was to hold Science Festivals in Poland.

Prof. Ignacy Adamczewski (1907-2000) became Vice-president. He graduated from



Warsaw University, where he also had his Ph.D. in 1936. He specialized in liquid dielectrics. He took part in the 1939 Polish-German War and was incarcerated for some time in the Auschwitz concentration camp. After World War, he went to Gdańsk, where he established and held the chair of physics at Gdańsk Technical University and later at the Medical Academy until retirement. He published over 100 research papers and several books on dielectrics, radiation protection and a textbook of

physics in medicine. He was also President of the Gdańsk branch of the PSMP.

The position the Secretary went to Oskar Adolf Chomicki, M.Sc. (1931–) who graduated from the Physics Department of the University of Warsaw in 1954, majoring in solid state physics and working there for 5 years teaching problems in experimental physics. In 1957 he founded and ran a radioisotope laboratory attached to the Internal Clinic of the Bielański Municipal Hospital and taught physics to physicians at the Postgraduate Medical School in Warszawa. He had training in Sweden and did research in the USA. He published several dozen papers in Polish and international journals, and co-authored several books on radioisotopes and medical accelerators.

He was instrumental in founding the PSMP and in 1992 was awarded the title of an Honorary Member of the Society. He has contributed to many meetings and conferences on medical physics both in Poland and world-wide, especially those involving the



(From the left) O. A. Chomicki and B. Gwiazdowski

participation of foreign visitors from all parts of the world. He also held the position of the Vice-President and President of the IOMP (1997–2006).

The difficult job of a Treasurer went to Dr Bogdan Gwiazdowski (1926 - 1982).He graduated from the Department of Applied Physics, Warsaw Technical University, in 1952 and started work at the Physics Laboratory, Institute of Oncology, Warsaw. His main interests were focused on the physical aspects of radiotherapy. In 1961 he spent a year at Christie Hospital and Holt Radium Institute, England, working under Professor Meredith. His work in Poland concerned radiotherapy planning, use of computers, radioisotopes, iodine uptake standardization, imaging techniques, calcium metabolism in man, etc. In 1964 he received his Ph.D. degree and the Award of the Ministry of

Health. In 1971, he set up a Dosimetry Laboratory at the Central Laboratory for Radiological Protection in Warsaw. He remained Head of this unit until his death. In 1975 he became Associate Professor. His research interests then turned to environmental and personnel dosimetry problems. He wrote over 100 articles and research papers. He was among the founders of the Polish Society of Medical Physics.

The main objectives set out before PSMP were as follows:

- I. To define and represent interests of medical physicists and bioengineers and to accord a higher prestige to their profession vis-à-vis medical community.
- II. To hold congresses, symposia and other meetings, or organize various forms of education and training.
- III. To develop closer ties with individual medical physicists abroad and with international organizations.
- IV. To start publishing the Society's own periodicals.

I. The prestige of medical physics

In most cases the prestige of medical physicists or bioengineers has always depended and will depend in the future in each individual case on the qualifications and professional skills, the ability to co-operate (team-work), and the friendly and favourable attitude of the medical environment.

From the very beginning the success of medical physics was inseparably linked with the degree of understanding and co-operation on the part of the medical community. By way of example I shall present to you the profiles of three persons that prove the case in point.

Władysław K. Jasiński (1916-1989)

Oncologist, Professor of Medicine, Director of the Institute of Oncology in Warsaw

(1961-72), member of the Polish Academy of Sciences . He graduated with a M.D. degree from the Jagiellonian University in Kraków in 1945 and became head of the Radiotherapy Department at the Gliwice Branch of the Warsaw Institute of Oncology. Between 1957 and 1976, he was in charge of the Department of Applied Isotopes of the Institute in Warsaw, then appointed Director of the Institute. He closely co-operated with the Physics Dept. of the Institute. As a full member of the Polish Academy of

Sciences, he also participated in the development of medical physics as a Chairman of the Medical Physics Committee of the PAS. From 1976 till his death in 1989, he was Director of the Autonomous Laboratory of Nuclear Medicine at the Medical Centre for Postgraduate Education.

During all his professional life he exerted a very significant impact on the development of medical physics (radiotherapy and radioisotopes) and education of medical physicists in Poland.

Walenty Hartwig (1910-1991)

An eminent clinician-endocrinologist, Professor of Medicine. He graduated from Warsaw University with a M.D degree in 1934, took his Ph.D. in 1938 at the Internal Medicine Clinic of the Baby Jesus Hospital in Warsaw (Head: Prof. W. Orłowski). In 1939, he was called up into the Army, as a Soviet prisoner-of-war escaped from the train





ending up in Katyń (place of a massacre of Polish officers) and became active in the Resistance Movement (AK) and in the Warsaw 1944 Uprising.

After World War II, he became Assistant Professor and Professor in Medicine. In this capacity, he initiated postgraduate medical education and was a founder and first Director of the Centre for Postgraduate Medical Education in Warsaw. As Head of the Internal Medicine (later Endocrinology) Clinic at Belański Hospital he was instrumental in setting up in 1958 the first Thyroid and Isotope Department, second place of this kind in Poland. He had full understanding of the need to co-operate closely with medical physicists, biologists and chemists. Thanks to his knowledge and farsightedness radioisotopes found wide application in internal diseases.

Hanna Kołodziejska-Wertheim (1914-2004)



She graduated with M.D. from Warsaw University in 1939, and then in 1943 started work in the Institute of Oncology in Warsaw. She actively participated in the Underground Movement (PPS-WRN). Had her training in USA, successively had a Ph.D. degree and in 1954 became Assistant Professor and later Full Professor in 1973.

Her greatest achievements are related to her 26 years' work as Head of the Kraków Branch of the Institute of Oncology,

which she turned into a modern clinical and research institution employing highly qualified staff (among others, medical physicists whom she supported by providing them with opportunity to have training in the best British institutions). She authored and co-authored some 120 research papers, and was a long-time editor of the quarterly *Nowotwory Journal of Oncology*. She specialized in cancer epidemiological studies, and especially in breast cancer treatment.

II. Congresses, Symposia, Education and Training

Of all the 14 Congresses of PSMP, and numerous Symposia held over the past 43 years let me single out two activities: Education and Training treated either separately or in combination.

The medical education in Poland started from the WHO/IAEA Seminar on Training and Education in Medical Physics held in Kiel (West Germany) 1–22 April 1972. It produced a REPORT, which, after having been translated into Polish as *Propozycja*

History of Polish Medical Physics...

programu rozwoju podstawowej kadry fizyki medycznej w Polsce (A Tentative Programme of Basic Training of Medical Physicists in Poland), was presented at one of the Plenary Meetings of the Medical Physics Committee of the Polish Academy of Sciences (Head: Prof. W. Jasiński) in May 1973. This programme, first of its kind, was discussed at that meeting at length leading, however, to quite a number of devastating opinions from the representatives of the medical profession, such as:

- There are too many physicists already,
- There may be difficulties in the medical physicists' university career,
- The programme leads to training of pseudo specialists, especially in radiology, etc.

I shall never forget the opinion of one of the members of the Committee who said: "The whole stuff should be rejected in toto..."

However, this heavily criticized programme was to be later used in preparing the curricula for Physics Studies at Warsaw University, and developed into a full-scale specialization programme for graduate students in operation to this day, having

hundreds of medical produced physicists and giving birth to similar THE SECOND INTERNATIONAL SUMMER SCHOOL SZKOŁA LETNIA "Physics in Radiotherapy" FIZYKI MEDYCZNEI W RADIOTERAPU 25 VIII - 3 IX 1977 August 26 - September 3, 1993 WARSZAWA Cancer Centre, Warsaw, Poland Sponsored by The M.Skłodowska-Curie Memorial Cancer Centre The M.Sklodowska Curie Memorial Foundation Polish Society of Medical Physics American Association of Physicists in Medicine International Organization for Medical Physics European Society for Therapeutic Radiology and Oncology International Ucley on Thetapeutor Radiology and Oncolog International Union of Physical and Engineering Sciences in Medicine The Stefan Batory Foundation Komitet Badań Naukowych

The 1st Summer School "Medical Physics in Radiotherapy" 1977, Warszawa

The 2nd International Summer School "Physics in Radiotherapy", 1993, Warszawa

programmes in many universities across Poland... As the famous saying goes: "Habent sua fata manuscripti" (Manuscripts have their own destiny — Terentianus Maurus, *De litteris, de sillabis et metris*).

Of all the training courses over the past 30 years let me recall these two memorable Summer Schools: "Physics in Radiotherapy".

III. Closer ties with individual medical physicists and institutions abroad

Polish medical physicists have always maintained close ties with their counterparts in Western European countries, as well as in the USA and Canada. These ties usually assumed the form of shorter or longer training courses, meetings, congresses and/or apprenticeships and traineeships.

In radiation medical physics the greatest impact has been made by British physicists either in their own country or on visits to Poland, especially at the first stage of medical physics development in this country. Here we have profiles of some most eminent British medical physicists who have co-operated with Polish medical physics:

Jack Boag (1911-2007)

Eminent medical radiation scientist and a great friend of Poland's. An Honorary Member



of the PSMP. He took a degree in electrical engineering at the University of Glasgow, and then went to work with John Cockroft at the Cavendish laboratory (Cambridge). Later he worked in a radiobiology unit at Mount Vernon Hospital, under the direction of Hal Gray. In 1964 became head of physics at the Royal Marsden Hospital and set up a research group in the Institute of Cancer Research. His

most significant research was in radiation chemistry and in medical physics. His activities spanned a wide range of other disciplines. He retired in 1976, but continued his interests in medical radiation also in his later years.

For over 30 years he showed vivid interest in Polish medical physics, did not spare his time or effort in teaching radiation to Polish physicists and participating in numerous meetings, symposia, and summer schools in our country. Polish radiation physics owes him a great deal.

(James) Ralston K. Paterson (1897-1981) radiotherapist

During the First World War he joined the army and fought at the French-German front

being awarded the Military Cross. He graduated in 1923 and then started work in radiology and surgery. In 1931, he was appointed as the director of the Holt Radium Institute at the Christie Hospital in Manchester, where he made important contributions in radiotherapy. He understood that the costly diagnostic and treatment facilities should be centralized. In the so-called Manchester system emphasis was put on standardization, scientific measurements, and transferability. He has been to Poland twice and



invited many Polish medical physicists to Manchester to his world-famous medical physics courses.

John Barlow Massey (1925-)

He graduated in 1949 and joined the staff of the Christie concentrating on the application of physics to radiotherapy. The establishment of a Regional Department of



Medical Physics and Bioengineering, of which he became a Director, led to a rapid expansion in the role of medical physics. He served in many positions in the British Hospital Physicists' Association. He is the author of a well-known book *Fundamental Physics of Radiology* (with W. J. Meredith). At Christie's, together with Prof. Paterson, he had under his care Polish medical physicists who were taking part in training schemes

in radiation physics. He also visited Polish Institutes of Oncology four times, and each time brought with him specialist literature, books and valuable recommendations.

William John Meredith (1913–?)

Medical radiation physicist, a Knight of the Order of British Empire. In 1937, he joined the physics staff at the Holt Radium Institute in Manchester. In mid-1930s, when the foundations were laid for a quantitative systematic approach to clinical radium therapy one of his first tasks was to develop a radium system for cancer of the uterine cervix. He also implemented the Manchester Radium Dosage System. He was head of the Department for 34 years. A talented teacher, he



collaborated very successfully with the medical community on a local, national and

international scale. He is best known as co-author of *Fundamental Physics of Radiology* (together with J. B. Massey).

William Valentine Mayneord (1902-1988)

Medical radiation physicist, a Knight of the Order of British Empire. On graduating, he



went to St Bart's as a Demonstrator. He retired from the Institute of Cancer Research and Royal Marsden Hospital as Emeritus Professor of Physics as applied to Medicine, a position created for him in 1940.

His scientific career has included original contributions in a wide range of subjects. He was joint author of the first paper reporting specific chemical carcinogenesis, pioneer in X-ray and radionuclide dosimetry,

and inventor of radionuclide scanning. He participated in many national and international organizations involved with medical use of ionizing radiation. He was the first President of IOMP, and Fellow of the Royal Society.

IV. The Polish Medical Physics Society's own periodicals

Almost from the very beginning, the PSMP was fully aware that it should have its own periodical, whose name was borrowed from the then well-known *Postępy fizyki* published by the Polish Society of Physics.

The first issue of *Postępy fizyki medycznej* (Progress in Medical Physics) was printed in December 1966 in 250 copies under very primitive conditions. Then it was continued until 1995.

Out of 600 papers there were:

- ~85% original research papers,
- ~12% review papers,
- ~3% historical papers.

The Editorial Board (1966-95) included the following persons:

Ignacy Adamczewski Jan Doroszewski Konrad Fijałkowski Jan Grączewski Barbara Gwiazdowska Andrzej Hrynkiewicz Cezary Pawłowski Jerzy Peńsko Adam Piątkowski (Editor) Andrzej Polawski Julian Rotnicki Waldemar Scharf (Editor)

Jerzy Jankowski	David Shugar
Władysław Jasiński	Ewa Skrzypczak
Władysław Kapuściński	Mariusz Stopczyk
Witold Katkiewicz	Józef Terlecki
Juliusz Keller	Jerzy Tołwiński
Andrzej Kwieciński	Władysław Torbicz
Adam Marecki	Emanuel Trembaczowski
Grzegorz Pawlicki	

In 1995, *Postępy fizyki medycznej* was renamed to *Polish Journal of Medical Physics and Engineering* (in English) and has been in publication since then.

Perhaps it should also be mentioned that in Autumn 1986 another periodical started to be published *Fizyka medyczna* (Medical Physics), an official bulletin of the Polish Society of Medical Physics. It had two Managing Editors: B. Gwiazdowska (Nos. 1-12), and Oskar A. Chomicki (Nos. 13-30). The Bulletin ceased to be published in 1995.

Conclusions

- For over the past 50 years Polish medical physics and bioengineering has been successfully and uncontroversially cooperating in the framework of the Polish Society of Medical Physics,
- The high position and prestige of medical physicists has been (on the whole) maintained,
- Cooperation with individuals and international organizations has been more than successful, and
- The future of Polish medical physics is bright albeit slightly clouded by the outflow abroad of well-trained specialists and limitations imposed by the still developing economy.

Suggestions

- To increase co-operation among various medical physics and bioengineering institutions,
- To become even more committed to the international co-operation, and
- To become more visible and more popular among the medical community and in the media.

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