A MATHEMATICAL PILGRIMAGE

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In June 2001, Prof Art Kirk (University of Iowa) and myself were visiting with Prof Kazimierz Goebel and other research colleagues at the Maria Curie-Skłodowska University in Lublin, Poland. As a special treat our hosts organized a two day excursion to Lwów, the city where Stefan Banach spent most of his mathematical life. Lwów is the Polish name, and the name in use during Banach's lifetime, it is now in Ukraine and its official name is Lviv (in Russian it is known as Lvov, its German/Austrian name was Lemberg).

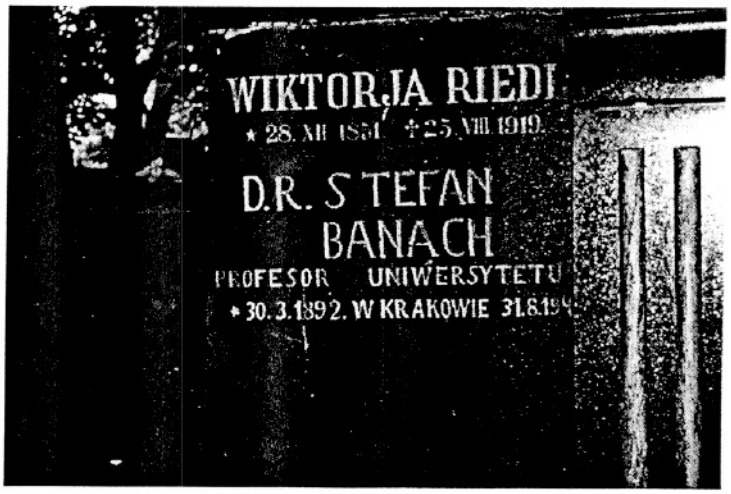
Banach moved from Cracow sometime between 1910 and 1913 to study Engineering at the Lwów Polytechnic. And, apart from a brief interlude during World War I when he returned to Cracow, Banach remained in Lwów until his death in 1945, aged 53 [for details of Banach's life see: *The life of Stephan Banach* by Roman Kaluza, Birkhäuser, 1996]. During the nineteenth century, and especially in the period of Polish independence between the wars, Lwów must have been one of the most picturesque cities in Europe and an important centre of culture. Leopold Sacher-Masoch was born in this city where his father was director of police. Ludwig von Mises, Stanisław Lem, Stanisław Ulam, Alfred Lotka, Salomea Krushelnytska and Muhammad Asad were born and lived there. It was a city of wide tree lined avenues, parks, grand buildings and elaborate churches; a city of restaurants and cafés with a rich and diverse cultural and social life, reflecting strong Polish, Ukrainian, Jewish, Armenian and Viennese influences. It has retained much of that character. A great effort over the last decade has seen the city's central area elegantly renovated and restored so that today it remains an enchantingly beautiful city. More information about the city may be found at http://www.tc.umn.edu/ babin005/lvov/index.htm/

To enter the Ukraine one requires a visa, issued in advance, and to obtain this an invitation to visit the country seems necessary. Art and I had invitations from the Institute for Condensed Matter Physics of the National Academy of Science of Ukraine [*http://www.icmp.lviv.ua/*] and we are grateful to them for providing the opportunity to make what proved to be a delightful and fascinating visit.

Art Kirk, Kaz Goebel, Yuri Kozitsky and I left Lublin early on the morning of Wednesday 6th June and arrived in Lwów for a late lunch. It takes about three hours driving to go from Lublin to Lwów, with much to see along the way. One must also allow an hour or three to negotiate the Polish-Ukrainian border.

In the afternoon we visited the Lichakiv cemetery where Banach's grave is to be found, just left of the cemetery entrance, as a side-panel to the polished black granite Riedl family tomb. It carries the inscription shown in the photograph on the next page.

The "D.R." appears to have been added as an afterthought or sometime later. The connection between Banach and the Riedl family is uncertain. It is known that Banach and the lawyer, businessman, Dr Tadeusz Riedl were friends and Banach provided Riedl's son with private lessons in mathematics during the war years. The privations and abuses suffered by Banach in the later part of the war left him wasted and exhausted and shortly after the Russian liberation of Lwów he went to live with the Riedls in their apartment on Dwernickiego Street, where he passed away some 13 months later.



Banach's grave in the Lichakiv cemetery

Lichakiv cemetery is the resting place of many famous, and infamous, people; authors, military leaders, prominent politicians and the like. It was therefore especially heartening to four mathematicians to see an elderly guide stop in front of the tomb and point out to the party of tourists he was conducting through the cemetery that 'here one finds the grave of an important mathematician'.

After visiting the cemetery we drove to the 'High Castle'; a hill on the outskirts of Lwów, which provides a panoramic view of the city with its many and varied church spires and domes dominating the skyline. In ancient times (mid 13th century) the hill was indeed crowned by a castle; the palace of Danylo Halitski, a Ukrainian Duke, who founded the city which was named after his son Leo (Lew). The Latin name of Lwów is Leopolis.

We spent the night at the Grand Hotel, located in the centre of the city on the Prospect Svobody (Freedom Avenue). It is a western style **** hotel (US$90 a night, with a complimentary half-bottle of champagne to welcome you to your room). I can thoroughly recommend the Ukrainian vodkas and beers we were served at its bar until late that night.

Next morning we strolled from the hotel, along Prospect T. Shevchenko (in Banach's time, Akademicka Street), to the site of the famous Scottish Café. It occupied the ground floor of an imposing four-storey building with a turreted roof. The café has long since ceased to operate and is now replaced by a 'Desert' Bar. But, it was an eerie feeling to be in the place from which so much good mathematics once flowed under such colourful circumstances [for some of the details, see: *The Scottish Book – Mathematics from the Scottish Café*, edited by R. Daniel Mauldin, Birkhäuser, 1981].

Our pilgrimage to the Scottish Café was followed by a visit to the "vernissage", an open air market brimming with artworks, ranging from religious icons to abstract impressions of Lwów, and unfathomable other craft items. It adjoins Teatralna Street and is situated just in front

What used to be the Scottish Café

of the Maria Zankovetska Drama Theatre. From the market we adjourned to the Restaurant Amadeus for a leisurely, and truly gourmet, Viennese style lunch before moving on to the Jan Kazimierz University. The University was founded in the middle of the 17th century by the Polish King Jan Kazimierz and is the University to which Banach was attached for much of his career. After it came under Russian control in 1944 the University was renamed the Ivan Franko University (the name it still bears today), with S. Banach its first Dean of Mathematics.

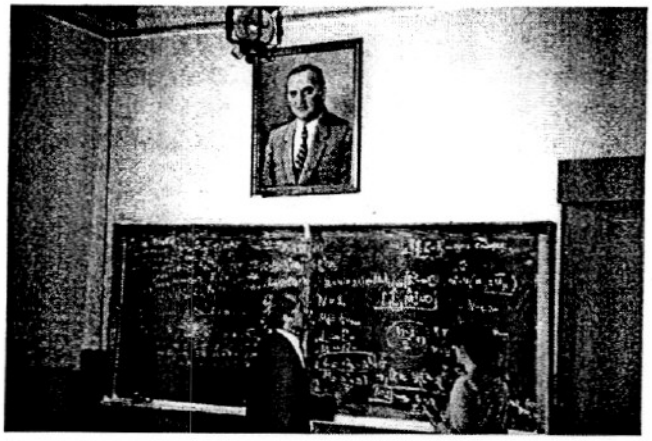
View along Prospect T. Shevchenko, looking from the Scottish Café

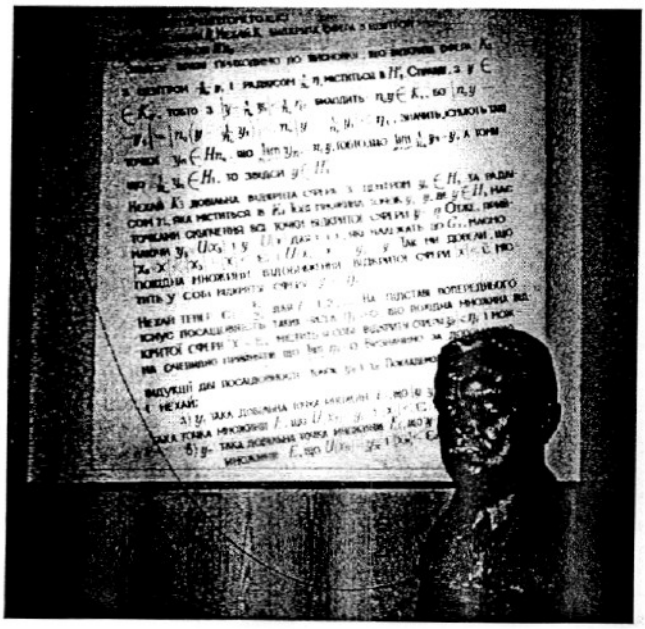
On the opposite side of the road from the University's main building is the spacious, tree filled T. Kosciuszko Park (now the Ivan Franko Park). Its walkways are bordered by old wrought iron and plank benches. One of these could well be the very park bench on which a young Stefan Banach and Otto Nikodym were seated discussing Lebesgue measure when their conversation was overheard by Hugo Steinhaus, and so Banach was brought to the attention of the world of academic mathematics.

Inside the University there is a classroom, still in use today, dedicated to Banach. The blackboard is topped by a portrait done in oils, and a bronze bust of Banach stands proudly on a pedestal in one corner. The walls are adorned with statements of some of his major and best-known results.

It was while at the University that the unexpected highlight of our visit took place. On the stairs we 'accidentally' met the Dean of Mathematics, Professor Yaroslav Prytula, Banach's immediate successor. He invited us to his office and, after exchanging pleasantries, opened the top right-hand drawer of his desk and proceeded to layout on the table first Banach's and then Schauder's University files.

The folders were tattered and the papers inside yellowing, but overwritten in blue pencil on the first page of Banach's file one could easily pick out: 'file closed', 'died 31 August 45'. The files contain many treasures: details of their promotions, teaching assignments and so on, which we had only time to glance through. For us the most impressive was Banach's hand written (in Ukrainian) Curriculum Vitae that the new administration required he submit early in 1945. There is also a recommendation letter written in hand by Pavel Aleksandrov and Sergei Sobolev. Beside being stunned by the opportunity to see and handle such documents, I remember thinking that today we wouldn't even shortlist someone for a job on the basis of a one page C.V. like this. In Schauder's file one finds, for example, a letter of recommendation for his Habilitation signed by Pavel Aleksandrov and Solomon Lefschetz.





Three views inside the Banach Room at the Ivan Franko University.