Bogusław Jackowski and Janusz Marian Nowacki

Bogusław Jackowski and Janusz Marian Nowacki have made and continue to make many important contributions in the world of TeX fonts.

[Interview completed 27 September 2008.]

Dave Walden, interviewer: Will each of you please tell me a bit about your personal history and life.

Bogusław Jackowski, interviewee: I came to this world in the middle of the previous century, in 1950, in Gdańsk (Danzig). My school years I spent in another city, but I always dreamt about coming back to Gdańsk which I have considered extraordinary. The city is picturesquely placed between the Baltic Sea and the band of postglacial hills covered with beautiful forests. So, for studies I came back to Gdańsk. I studied chemistry at the Gdańsk University of Technology, but I didn't feel like a chemist whatsoever. Having finished studies (1972), I switched immediately to the realm of computers: I started to work as a programmer in a computing center at the Gdańsk University, and next as a teaching assistant in the Department of Mathematics in a newly established Division of Computer Science.

Oh, the giant machines of those days, placed in specially conditioned large halls, paper tapes, drum memories, teletypes, line printers, consoles resembling typewriter machines . . . . No screens, no color/laser printers, no pen drives, no CDs, unbelievable!

Still, the work with students was exciting: there was no magic in the computer—each behavior was explicable. It was unforgettable experience to see how hard it was for students to accept that wrong results imply unavoidably an error in their programs: "I checked thoroughly, there is no mistake in my program; it must have been the computer's slip." And next long, laborious line by line checking of the printout and eventually—eureka!—"aaaa, it is this little semicolon, responsible for completely screwed up results!" Nowadays, I'd never try to convince newbies that the computer is infallible.

Incidentally, neat program listings was my first experience with "computer typesetting".

Janusz Marian Nowacki, interviewee: I was born in 1951. I live in Grudziądz, in the northern part of Poland. I studied journalism at the Warsaw University and worked as a journalist. Hence my interest in typesetting and typefaces—I was familiar with the printing technology of that time.

In 1981, martial law was introduced in Poland by the Communist government (in order to clamp down on the independent "Solidarity" movement) which in my case resulted in unemployment and loss of prospects for further development. I started a private enterprise—photo services. Next, I began to produce stamps, manufactured then with lead types.

DW: What kind of stamps are you talking about, Janusz—postage stamps or some other kind?

JMN: Sorry for being imprecise. I meant rubber stamps (now, actually, polymer stamps or flash stamps).

DW: Please tell me, each of you, how you first came in contact with TeX.

BJ: During my work at the Gdańsk University I encountered *The Art of Computer Programming* by Donald E. Knuth (there was no Polish translation). I was delighted with the theoretical part of the book, although I have never been convinced that it was a good idea to provide programs in MIX and only in MIX for all algorithms.

Anyway, we tried to use as much as possible from Prof. Knuth's marvelous book, although not only that. We "harassed" our students also with the ideas of Edsger W. Dijkstra, Niklaus Wirth, Tony Hoare, et al.

In the middle of the seventies there was a rumor that Prof. Knuth had suspended his work on *The Art of Computer Programming* and begun to work on a new typesetting system, $\tau\epsilon\chi$). In the meantime, however, I changed my job. My new task, in the Polish Academy of Sciences (PAS), was numerical programming of hydrodynamical processes. Theoretical computer science was no longer needed. I was about to forget Prof. Knuth's achievements....

Fortunately, in such institutions like PAS, there was an obligation of writing annual reports. Of course, reports contained math formulas and the most common method was using a typewriter machine and manually adding formulas with a pen. One nice day the situation improved: a program named ChiWriter was issued. Then I remembered about $\tau\epsilon\chi$.... I wrote one or two reports using ChiWriter (it was a nightmare in comparison with the traditional "technology"), but pretty soon we had TeX in our institute which resulted soon afterwards in my abandoning the work in PAS and beginning a private enterprise — a small typesetting firm. I work today in the fourth incarnation of that enterprise.

JMN: In 1992, I learnt that rubber stamps could also be produced using computers. However, I was 40 years old, I did not possess a computer and had no idea how to use such a computer. Roughly, I understood that so-called typesetting-dedicated software was needed. At the early nineties, only two programs were practically available: commercial Ventura Publisher and free TeX. Obviously, I decided to get the hang of the latter. If I knew then that TeX is actually a programming language....

I bought a computer with a printer. Jacko — whom I met by chance — provided a polonised version of TeX, called LeX, which he prepared with Marek Ryćko. I came back home, connected cables, switched the computer on and ... I was not able to do anything more. I did not know that there existed such things as operating system, command lines, etc. To make matters worse, I didn't speak English.

But I am a dogged person. With a very-small-steps method, I finally made my first stamp using the computer. The situation was rather difficult, as there was nobody in Grudziądz (about one hundred thousand inhabitants) to contact for help. I guess that there were several PCs in the city then. But all in all, I was successful; the money for the computer was not spent in vain.

DW: Please tell me, each of you, how you first got involved with fonts?

JMN: Having TeX run on my PC, I realised that the collection of fonts coming with TeX was insufficient for practical applications other than typesetting *The Art of Computer Programming*. There were only Computer Modern fonts and their polonised version, the PL fonts. That was all. About PostScript (with its collections of fonts and possibility of scaling) I knew nothing. Imagine now, that you were expected to make a stamp for "Grudziądzkie Zakłady Przemysłu Gumowego" (literally: Grudziądz Rubber Industry Plants) where the font should have the size 12 points and the width of the stamp was 5 cm, and so should be the width of the text.... Among my lead types, there was

a typeface REX (similar to supercondensed Helvetica), that I previously had used for this then very important customer. Therefore, I prepared a bitmap (PK) REX-like font containing only necessary glyphs and nothing else, in particular, no kerns. One can say that the work was trivial if not trifling, but I managed to retain the customer.

Still, I missed other genuine Polish typefaces that used to be commonly available in lead type. The achievements of Polish typographers are worth noting — there exist quite a lot of really interesting designs. I had a pleasure to be acquainted with one of the most respected artists, Zygfryd Gardzielewski from Toruń (Thorn), the designer of Antykwa Toruńska. I liked the font very much but a version usable with TeX did not exist which was annoying for me. Therefore, I started experiments with the electronic replica of Antykwa Toruńska (in 1996). Finally, I contrived to produce a Type 1 font using a bunch of varied tools. If I knew then what nasty beasts are fonts . . . .

BJ: If your native language is not a diacriticless English, you have no other choice once you started to fiddle around with TeX — you have to get involved with fonts.

Being very enthusiastic about TeX, my friend Marek Ryćko and I worked on polonisation of TeX since 1987. Part of the polonisation was, of course, preparing a Polish-oriented version of Computer Modern fonts (the PL fonts). After a few interim stages, we released a stable version of Polish plain TeX, called MeX(at the end of 1991). The letter "M" stood for the Polish encoding, Mazovia (the word is the Latin name of the region in Poland where our capital is located), popular then in Poland. Remember that there were no coding pages containing Polish diacritical letters; CP-852 came only with MS DOS 5.0 (September 1991). Actually, there are "veteran" customers of my firm for whom I still typeset in Mazovia.

Working a lot with fonts, I slowly became aware that bitmap fonts were becoming extinct. The world around used primarily outline fonts (PostScript Type 1 fonts, True-Type fonts), keeping bitmap fonts (of relatively low quality) only for screen applications. From this point of view, I feel now, after a quarter of a century, that making METAFONT heavily bitmap-oriented was a misconception.

So, I started to think about preparing an outline version of the PL fonts. I thought, and Janusz just worked. All of sudden, in 1997 at the Polish TeX Users Meeting in Bachotek (BachoTeX), he announced the outline version of the PL fonts. He based his work on the AMS Computer Modern fonts in the PostScript Type 1 format, which had very good quality and were newly released as freeware (in March the same year).

When the outline version of Polish TeX fonts had been published, I hoped that I could retire from font works . . . . However, I underestimated Janusz. He came up with the idea of us preparing an engine for generating outline fonts, employing either METAFONT or METAPOST. The idea was so exciting that I agreed. Later, Piotr Strzelczyk joined us. The result of our collaboration was MetaType1 which we still use today for our font projects.

So, the warning of Prof. Knuth — "Type design can be hazardous to your other interests. Once you get hooked, you will develop intense feelings about letterforms; the medium will intrude on the messages that you read. And you will perpetually be thinking of improvements to the fonts that you see everywhere" — turned out to be prophetic.

DW: Janusz said that you two "met by chance", but there must be more to the story than that for you to have created such a long-lasting collaboration.

JMN: Well, I had a lot of questions, Jacko was sufficiently patient to answer them . . . . The distance between Gdańsk and Grudziądz is about 100 km, not too far, so we could meet when the problems were too difficult to solve them using the telephone. Very im-

portant were our annual TEX users meetings in Bachotek (organised continuously since 1993); the main organisers were from the very beginning Jurek (Jerzy, George) Ludwichowski and Jola Szelatyńska. We could spend there a few days discussing, solving problems and just talking.

The outlined version of the PL fonts (consistent with the bitmap, i.e., PK, version released with MEX) was prepared by me. I managed to polonise the CM fonts publicly released by AMS within two months and to announce the result at the Bachotek meeting. Later, in collaboration with Jacko, the outlined PL fonts were improved.

DW: I'm also confused about how many firms we are talking about (Jacko mentioned a "fourth incarnation"); are you in business together today or in separate businesses?

BJ: Janusz and I run separate firms. My firm BOP, established in 1993, is being run only by me and Piotr Pianowski, although he and I collaborate with Janusz (occasionally) and with Piotr Strzelczyk (more regularly). My earlier attempts to establish a private enterprise failed, mainly due to my lack of experience in business.

DW: Let me be sure I now have this straight. Janusz's firm makes rubber stamps, and Jacko's firm does typesetting; and you both originally worked with fonts to have available what was necessary for application in your stamp and typesetting work — correct?

JMN: Yes.

DW: However, you have continued to work with font development in a major way, perhaps beyond what is needed for your businesses. Why is that?

JMN: When I started to work with a computer, everything installed there was from abroad, namely from the USA. But I wanted to use genuine Polish typefaces, such as Antykwa Półtawskiego, Antykwa Toruńska, Kurier, Cyklop, etc. This was my primary motivation. Of course, the best situation is when the work you are doing to achieve your business goal is also your hobby — that was my case.

BJ: Beside the motivations mentioned by Janusz, I'd add another one (I'm pretty sure that Janusz shares my opinion): we got a lot from many people who contributed to the TEX system. We got it for free. We felt obliged to reciprocate with what we could reciprocate. Fonts was the area in which we were most advanced, for the reasons mentioned earlier.

DW: Is there any specific division of work between the two of you, and Piotr?

BJ: Roughly, Janusz manipulates with Bézier curves, I manipulate with METAPOST macros. Piotr collaborates with us at the level of concept; sometimes we write macros together, and we ask him always for help while debugging (METAPOST code or resulting fonts).

DW: Can I assume all this work is done on the computer, or is some of it done with actual paper, brushes, and ink?

BJ: We have no education in drawing art, the more so in typography. Thus, we would not dare to attempt to design glyphs using "paper, brushes, and ink". Moreover, there are a lot of well-designed fonts around, drawn by skilled artists, awaiting digitization — enough to fill our time to the end of our days.

DW: How do you interact in doing this work — in person, on the phone, email, Skype? I imagine it is hard to talk about character designs without actually seeing them.

JMN: We contact each other in all possible ways. But it is a personal meeting that is most important in this kind of work. Especially, informal meetings turn out to be very stimulating and fruitful.

DW: How did you meet Jerzy Ludwichowski and other TEX people, and how did they influence your work in the TEX world?

BJ: Most of the TEX people with whom I'm still in touch I met at the founding meeting of our TEX users group, GUST, in 1992. In particular, I met there Jola Szelatyńska and Jurek Ludwichowski. With some people, however, I was acquainted earlier. For example, Marek Ryćko, with whom I worked on MEX, used to be my student.

No doubt, our most important relationships developed during our annual BachoTEX meetings. I was there from the very beginning. Janusz appeared already at the second meeting. It is difficult to tell *now* how particular people influenced us — everybody in his or her personal way. But even people who appeared once or twice at BachoTEX might have influenced us with their questions, problems, ideas, etc. Also, one can not overestimate our contacts with many colleagues from abroad, which originated from BachoTEX and other TEX users meetings.

DW: Turning to the actual designs, will you please briefly describe your major works and how each came about.

JMN: Our first major common work was tuning the outline PL fonts. It was a prelude, in a way, to the Latin Modern and TEX Gyre projects, the most complex ones we are carrying out. Another common work of ours, which urgently awaits its finishing, is Antykwa Półtawskiego, the first parametric font programmed in MetaType1. In fact, we developed MetaType1 to make Antykwa Półtawskiego.

In the meantime, I worked on other fonts. My first replica was Antykwa Toruńska. Its initial version was prepared without MetaType1, but as soon as that programming tool was available, I immediately switched to it. Using MetaType1, I prepared Kurier, designed by Małgorzata (Margaret) Budyta, Iwona (a variant of Kurier by me) and Cyklop, of unknown design.

(Examples of some of the fonts described in this interview are included at the end of the interview.)

DW: You've written a number of articles about technical aspects of the fonts, for example, the list at `http://tug.org/TUGboat/Contents/listauthor.html#Jackowski`, `Boguslaw` which includes Jacko's joint publications as well as solo papers, and `http://tug.org/TUGboat/Articles/tb29-1/tb91nowacki-cyklop.pdf` which is by Janusz alone. However, perhaps you can also tell us about some of most frustrating and some of the most rewarding incidents during your efforts involving these fonts.

JMN: The lack of the precise specification of the fonts we are expected to provide, i.e., fonts in the OpenType format, claimed nowadays to be the worldwide standard, is perhaps the most frustrating aspect of our work (compare, for example, existing documentation (?) of the OpenType format with Prof. Knuth's documentation of the TFM or PK files). But this cannot be called a passing incident — it is a permanent state.

BJ: Another frustrating, if not annoying, aspect is a worldwide licensing madness. We have to spent our time struggling with license problems, an area in which we are completely ignorant, because licenses became an obligatory part of software packages. At the same time, we are aware that the GPL, being recently in fashion, is hardly suitable for such font projects like TEX Gyre. Moreover, we have to answer arrogant letters from commercial firms because we happened to use in an unfortunate context a registered font name, etc. How can intelligent people seriously consider such things? The incredible heritage of mankind awaits for every newborn man, in particular, speech, art, technology, and science. Such a man grows making use of *all* mankind's achievements, but then

invents serendipitously a new dot or a comma and demands a long-lasting protection of "creator's" rights . . . .

A nice story was told by Hermann Zapf during the European TEX Users Meeting in Pont-à-Mousson, 2005. One of the first persons who brought a lawsuit (incidentally, in the USA) for an unauthorised usage of his typeface design, was Frederic W. Goudy. After Goudy's long explanations of what is the font design, the trial was practically concluded by the judge's question: "Mr. Goudy, are you the inventor of the alphabet?"

Well, about the dark sides of life one can talk ad infinitum (smile).

JMN: Most rewarding and stimulating is being aware of the fact that a lot of people use our work and not infrequently express their gratitude and are interested in further developments. Of course such things as receiving awards is always a pleasure — I received twice the so-called "Gustav prize" from our GUST organisation. Both Jacko and I are honorary members of GUST. All this is encouraging as it means that our efforts have been acknowledged by the TEX society.

BJ: Janusz hit the bull's eye. But to drift a little bit from a too serious tone, I'd like to mention an incident which was at the same time highly frustrating and rewarding. It was also during the European TEX Users Meeting in Pont-à-Mousson. I wanted to explain in my talk, in the presence of Prof. Knuth, a long-standing bug in kerning in Computer Modern fonts, unremovable for obvious reasons. It was one of my arguments against the idea of preserving 100% compatibility between the Latin Modern and Computer Modern fonts (whatever 100% compatibility might mean here). Imagine my jitters when, after my explanations, Prof. Knuth stood up, said "but" and . . . sat back down. And can you imagine my relief afterwards.

DW: Thank you very much, both of you, for participating in this interview. I am sure I am not alone in appreciating, as an everyday user of the fruits of your effort, how much you have contributed to the TEX world. Examples of your fonts follow, for readers' pleasure.

Family **Latin Modern Roman** — Based on Computer Modern, 72 fonts; nearly 800 glyphs per text font

OHamburgefonsz

ąæàáâãäåăăǵŭǹ̊̃ẽẚâ̂à̂å̂ã̃̈ä̦ẚæ̊åāą̆å̆

Family **Antykwa Poltawskiego** (Półtawskiego) — regular, bold, normal and italic; 239 glyphs per font

OHuńgąrfónsż

Family **Antykwa Torunska** (Toruńska) — light, regular, medium, bold, normal and italic; 1310 glyphs per font

ÓHůňǵąŗföñsź

Family **Kurier** — light, regular, medium, bold, heavy, normal and italic; 1406 glyphs per font

ÓHůňǵąŗföñsź

Family **Iwona** — light, regular, medium, bold, heavy, normal and italic; 1406 glyphs per font

ÓHůňǵąŗföñsź

Family **Cyklop** — normal and italic; 902 glyphs per font

ÓHůňǵąŗföñsź

Family **TeX Gyre Adventor** — regular, bold, normal and italic; 1244 glyphs per font

ÓHůňǵąŗföñsź

Family **TeX Gyre Bonum** — regular, bold, normal and italic; 1244 glyphs per font

ÓHůňǵąŗföñsź

Family **TeX Gyre Cursor** — regular, bold, normal and italic; 1244 glyphs per font

ÓHůňǵąŗföñsź

Family **TeX Gyre Heros** — regular, bold, normal and italic; 1244 glyphs per font

ÓHůňǵąŗföñsź

Family **TeX Gyre Pagella** — regular, bold, normal and italic; 1244 glyphs per font

ÓHůňǵąŗfößñsź

Family **TeX Gyre Schola** — regular, bold, normal and italic; 1244 glyphs per font

ÓHůňǵąŗfössñsź

Family **TeX Gyre Termes** — regular, bold, normal and italic; 1244 glyphs per font

ÓHůňǵąŗfössñsź

Family **TeX Gyre Chorus** — italic; 926 glyphs

ÓHůňǵąŗfössñsź