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ABSTRACT:

Although relatively independent development of computing technology in Czechoslovakia can be traced to the 1920s and 1930s, the field of digital computers only took off under the influence of Antonín Svoboda (1907-1980) in the late 1940s. As the *lingua franca* of computer designers, programmers, and computer scientists coincides with the language of the Soviet bloc's greatest enemy, the USA, it is not surprising that computers also implicitly carried with them the sense of freedom.

The freedom connected with computers is not associated just with the straightforward sense of escaping Czechoslovakia, although most employers from the Institute for Mathematical Machines followed Antonín Svoboda and emigrated to the "West", mostly the USA. Paradoxically, this formerly "bourgeois" discipline was a refuge for the people who, not being of working-class descent, could not study the humanities under communist government.

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1. Introduction

The fast spread of computing technology and its domestication in the Soviet bloc countries after 1989 is taken for granted. The influx of computers into homes as well as offices, the arrival of the Internet at in the academic institutions in Czechoslovakia in early 1990s¹ and other changes were so fast that one almost forgets that there were computers in the Soviet bloc before 1989: “This is my first lesson on a computer”, Václav Havel² wrote in a letter from January 11, 1988.³ The delivery of a computer to Václav Havel, probably the most famous Czechoslovak dissident, from the “West” was preceded by several years of correspondence.⁴ The discussants were concerned not just with Havel’s resistance to new technology, but also with the difficulties of producing correct signs of Czech (and Slovak) alphabet on the computer screen and on the printer.⁵ This was partially because the possibility to use computers for producing SAMIZDAT⁶ journals and magazines offered itself: this way, the dissident circles would have avoided the necessity to type the SAMIZDAT issues on a typewriter. Although Václav Havel said that “making (carbon) copies on a PC is like sharpening a pencil with a space rocket”, he ultimately accepted the new technology, probably also due to the influence of his brother, Ivan M. Havel.⁷

In the 1980s, it seems computers and other modern technological achievements were important for subversive activities: SAMIZDAT could work faster with photocopying (instead

¹ The first institution connected to the Internet was the Czech Technical University in Prague on February 13, 1992. <http://www.cesnet.cz/sdruzeni/napsali-o-nas/2009/02/unor2.html>

² Václav Havel, playwright, dissident in communist Czechoslovakia, president of Czechoslovakia 1989-1992, president of the Czech Republic 1993-2003. Václav Havel’s brother Ivan is a computer scientist. Ivan M. Havel, younger brother of Václav Havel, studied at the Czech Technical University in Prague (graduated in 1966) and earned his Ph.D. in computer science at the University of California, Berkeley. (cf. his homepage, http://www.cts.cuni.cz/~havel/extended_cv.html)

³ The letter was addressed to František Janouch, a son-in-law of Ernest Kolman, the author of the 1955 article “What is cybernetics?” in *Voprosy filosofii*. František Janouch is a physicist. He was dismissed from his position at ČSAV after the military suppression of Prague Spring and emigrated to Sweden. Václav Havel, František Janouch, *Korespondence 1978-2001*. Akropolis 2007, p. 363

⁴ Between Václav Havel, the first post-1989 president of Czechoslovakia, one of the authors of *Charta 77*, and František Janouch, director of *Charta 77 Foundation* (Sweden)

⁵ Some issues connected with computers, especially when computers become more information-processing machines than just computing machines, are dealt with on a national scale; typically the issues connected with the alphabet. In the interview with the author, Heinz Zemanek complained about the non-existence of a European keyboard. In his 2001 paper, “Computers in Small Countries.” In: Folta, J., ed., 2001, *Computing Technology Past & Future*. Prague Studies in the History of Science and Technology, New Series, Vol. 5, Zemanek complains: “One simple example is sufficient to prove the dependence [of Europe on the USA]: the computer character set, the two times 26 letters which ignore the needs of the bigger and smaller countries in Europe. This restriction damages the European language culture.” (The paper was delivered in 1997).

⁶ SAMIZDAT, loosely translated as “self-publishing”, was unofficial way of spreading documents as well as works of fiction in the society.

⁷ Letter of Ivan M. Havel to F. Janouch, December 22, 1986, Prague. In *Korespondence*, pp. 509-515.

of type-writing), consequently with computers with printers. At the same time, technology was an important field of competition of the two blocs since the very beginning of the Cold War⁸ Computing technology, in particular, was an area where, on one hand, the official representations of the Soviet bloc countries took the West as their role model,⁹ while on the other hand, the underground culture of PCs flourished.¹⁰ There was yet another dimension of the import of computers to Czechoslovakia:

“I would like especially the young generation connected to Charta [77], [Jazz Section] to be well or better prepared for the revolution that awaits our society and which is to a certain extent related to the use of computer technology, when the obstacles fall which make it impossible to use [computer technology] in the society, in what is nowadays called the official structures. [...] To a certain extent, I regard [computerization] of our ghetto¹¹ as a certain compensation for the years of persecution, injustice, impossibility to work in their own field.”¹²

Easier production of multiple copies, either by printing or photocopying, however, were not the only issues dealt with in connection with computers. Teaching programming and informatics at high school and even at elementary school level was a big issue in the 1980s¹³, but these efforts were mostly directed to the spread of MIS -- Management Information Systems, called Automated Systems of Control (ASŘ; Automatizované systémy řízení) in Czechoslovakia). These constituted the most important application of computers in particular in the Soviet Union.¹⁴ Some of the western observers thought MIS of the Soviet bloc were not implemented enough, despite having been (intrinsically for the Marxist ideology) the most important application. Until the early 1990s, “computer courses” at primary and secondary schools were devoted to programming (then mostly in Pascal); only

⁸ cf. Paul R. Josephson, "Projects of the Century"; Nixon to Khrushchev: "It's not space rockets, but fridges"

⁹ See Simon Donig, 'Appropriating American Technology in the 1960s: Cold War Politics and the GDR Computer Industry', IEEE Annals of the History of Computing, vol. 32, 2010, no. 2, pp. 32-45.

¹⁰ See. Patryk Wasiak, 'Computing behind the Iron Curtain: Social Impact of Home Computers in the Polish People's Republic'. ToE and IE Working Paper Series, WP_2010_08

¹¹ The word 'ghetto' is used by Janouch and probably refers to the feeling of isolation of the dissident community from the majority society in Czechoslovakia.

¹² František Janouch, *Korespondence*, p. 398. (August 5, 1988)

¹³ For example, Ershov advocated the teaching of informatics in secondary schools.

¹⁴ Cf. set of books *Computing in Comecon countries*: while the volumes on Czechoslovakia (Viček, 1975), Hungary (Pongratz, 1977), and Poland (Danda and Malerczykova-Dandova, 1978) also deal with the development of computers in general and to a certain extent with the history of computing technology in the relevant country, strikingly, the volume on the Soviet Union (Belecev, 1978) mentions none of the computer projects like BESM, MESM, SESM, not the efforts in the development of programming languages and other programming aids; the whole volume is devoted to automated systems of control (ASŘ/MIS).

after the basic programming classes would the students learn about word processing programs and other applications.

By pointing at some linguistic and politico-social issues connected with computing technology development in Czechoslovakia. The (necessary and officially promoted) knowledge of English, familiarity with the developments on the other side of the Iron Curtain (with very limited censorship), and the awareness of the political situation in Czechoslovakia makes the field of computing technology more than liable to have become a good hiding place for so-called 'subversive elements'. The subject was too complicated for the communists to monitor the lectures, which resulted in more relaxed atmosphere, in which political views were more freely communicated.¹⁵ Since the "correct" political opinion and high level of competence would not coincide too often, preference was given to competences.¹⁶

2. Communists supporting the development of computing technology

Soviet bloc support for computers and cybernetics is often mixed. However, while cybernetics was for certain periods of time regarded as "bourgeois pseudo-science"¹⁷, computers were regarded as useful devices for the whole period of time. The official support for computers was also used in pleading for support for cybernetics.¹⁸ The development of computing technology was strongly supported; and since in the early years, designing a computer was essentially a scientific endeavour, the emergence of the Iron Curtain between East and West affected the design (but not production) of the computers very little.¹⁹

Fascination with computers in the late 1940s seems to have been equally strong on both sides of the emerging Iron Curtain. ENIAC was put into operation in 1946; the first draft of a computer in Czechoslovakia was presented in 1947.²⁰ Even though the years immediately after WWII were a turbulent period for the academic environment, computing technology in

¹⁵ Interview of the author with Petr Vysoky, February 21, 2008.

¹⁶ Interview with Marie Raichlova, April 2, 2009; Josef Schwarz, June 30, 2006; Frantisek Novotny

¹⁷ For the story of cybernetics in the Soviet Union, see Gerovitch, 2002.

¹⁸ Slava Gerovitch, 2009, "Feedback of Fear". Presentation at ICHST Congress in Budapest, July 27, 2009; also *From Newspeak to Cyberspeak*, MIT Press 2002 (?)

¹⁹ William Aspray, "International Diffusion of Computer Technology," *Annals of the History of Computing*, vol. 8, no. 4, 1986, pp. 351–360.

²⁰ Korvasová (2003) speaks of a presentation of the design in Badatelský ústav matematický; in the supplement to the book by A. I. Kitov and N. A. Krinickij, 1958 (in Czech 1961), *Elektronické počítače*, Jaroslav Křížek (the translator) mentions (p. 130) only the "basic design by Antonín Svoboda from 1947". He also emphasizes that the construction of the first Czechoslovak computer was also a matter of pride (p. 130).

Czechoslovakia soon found its institutional place: first with mathematicians, later on independently, albeit the connection with mathematics was still maintained on many levels.²¹

After 1948, research and development in Czechoslovakia was being re-organized. A central institution for basic and applied research was founded in 1950, *Center for Scientific Research*, a year later renamed to *Center for Research and Technological Development* to show increasing emphasis on applied research. From the start, the subject of mathematical machines was included in this organization: out of the seven central institutes, the natural choice for the department for information processing machines was the Central Mathematical Institute. The director of Central Mathematical Institute, topologist Eduard Čech, was an admirer of Soviet mathematics.²²

The personal and institutional connections between mathematics and computing in Czechoslovakia in the first post-war decade are peculiar: originally an electrical engineer and a physicist, nowadays recognized as the founder of Czechoslovak school of computing technology, Antonín Svoboda (1907-1980) sought employment at the Department for Mathematics at Czech Technical University in Prague. He submitted his overview of analogue computing technology *Computing Mechanisms and Linkages*, (New York: McGraw Hill, 1948), best in its time, as habilitation thesis, but was not successful the first time. He therefore could not apply for the position of the head of the Mathematics Department, which required a completed habilitation. The chair had been taken by Václav Pleskot, a member of the communist party, but also an experienced mathematics teacher. Svoboda later habilitated with the same book, but the position had already been filled. Yet, he found support for the new field with Václav Hruška (1880-1954), the author of a compendium on numerical mathematics in Czech. In 1947, Antonín Svoboda and Zdeněk Trnka received UNRRA²³ grant to make themselves acquainted with the new technology.²⁴ Svoboda then

²¹ Apart from the difficult political situation connected with the transition of the society from democracy to communist party control, the academic environment faced additional difficulties resulting from six years' closure of Czech universities. As a consequence, heavy teaching loads were a rule rather than an exception in the five post-war years.

²² *Časopis pro pěstování matematiky*, 1950s

²³ UNRRA stands for the United Nations Relief and Rehabilitation Administration. The founding document of UNRRA was signed by 44 countries in November 1943. Its main purpose was to provide relief to the countries liberated during and after World War II, which included not only material assistance, but also study trips of specialists to the war afflicted countries and also trips of potential high-profile researchers from those countries to the countries that were better off, or more advanced in the particular field. In the case of computing technology, these were Britain and the USA.

²⁴ Cf. Vysoký, Petr, 2001, "Professor Svoboda, professor Trnka and first courses on computers at Czech Technical University." In: Foltá, Jaroslav, ed., *Computing Technology Past & Future*, Prague Studies in

began to teach a two-term optional course on mathematical machines at the Czech Technical University.

Computing technology development in Czechoslovakia was thus under strong western influence from the start. Antonín Svoboda (1907-1980), the head of the Institute for Mathematical Machines and its institutional predecessors,²⁵ was an influential person. He had many Ph.D. students ('aspirants'): Václav Černý, Jan G. Oblonsky, Miroslav Valach, Geroge J. Klir, and devoted colleagues,²⁶ but as a strong personality, he also had opponents, both within the Institute for Mathematical Machines²⁷ and outside it.

In early 1950s, there are hardly signs of Svoboda being marginalized: "his" project of constructing SAPO, the first Czechoslovak computer, was a top-importance task since 1951; Svoboda was the head of the Laboratory for Mathematical Machines, a relatively independent part of the Czechoslovak Academy of the Sciences, since April 1953. At the first conference on information processing machines in Liblice in December 1952, mathematicians and other colleagues outside the department for mathematical machines unanimously agreed on a resolution soliciting support for Antonín Svoboda from ČSAV. In 1954, he received a state prize for the calculating punch T-50 manufactured by ARITMA.²⁸ Even in 1961, *Czechoslovak Society for the spread of political and scientific knowledge* published a booklet on automatic computers²⁹ which quotes Svoboda's statement from 1958 that "mathematical machine (automatic computer) must not be a sensation-like surprise for young people. They must be acquainted with it as with a usual device, which is only one of many common means of earning one's living." In that talk, Antonín Svoboda

the History of Science and Technology, New Series, vol. 5, pp. 25-35. For more information on the UNRRA programme in general, see Frydryšková, Jana, 'UNRRA and support for science'. *Acta Polytechnica* Vol. 48, No. 3, 2008, : 38-39

²⁵ After returning from the USA after WWII and finishing the book *Computing Mechanisms and Linkages*, Antonín Svoboda received U.N.R.R.A. grant and travelled to Western Europe and the USA to study the latest development in digital computing technology. After this trip, he started giving optional courses on *mathematical machines*. He and his colleagues speak of information processing machines and mathematical machines, giving slight preference to one, then to the other. Similarly, the institutional places for computing technology were *Department for Information Processing Machines* (at Central Mathematical Institute at *Centre for Scientific Research*, later *Centre for Scientific and Technological Development*), *Laboratory for Mathematical Machines*, *Institute for Mathematical Machines*, and *Research Institute for Mathematical Machines*.

²⁶ Svoboda is remembered by many for his spirit: working in the mountains, informal working seminars, etc.

²⁷ Interview with Jan Sokol, April 16, 2009

²⁸ ARITMA was a company producing punched card machines, based in Prague.

²⁹ Samek, Miroslav, 1961, *Samočinné počítače* [*Automatic Computers*]. SNTL Praha. (Volume 26 in the line entitled "What we should know").

even compared computers to nuclear reactors and artificial satellites, the symbols of the “new era, full of expectations”.

In the early 1960s, the decision was taken to start with the training of computer programmers and computer-maintenance personnel already at the secondary school level. Beginning in the school year 1962/63, there were four secondary school classes in Czechoslovakia specialized in programming and operation of digital computers.³⁰ A year later, in parallel to those classes, there were one-year training courses for people who had already graduated from secondary schools.³¹

Antonín Svoboda spent major part of WWII at the Radiation Laboratory of the MIT. He received a medal for the work he had done there, and his Czech colleagues often give this as a major cause for Svoboda's initial failed attempt at habilitation. Second reason for the alleged marginalization of Svoboda was seen in his liberal-mindedness: for his colleagues, he organized a lecture followed by informal discussion with tea and cakes every second Friday and in winter, he organized research weeks in the mountains in winter. Mornings were devoted to research, afternoons were free.³² Svoboda's co-workers and Ph.D. students were a good team, which was regarded as almost suspicious by other people at the Mathematical Institute of ČSAV.³³ It is quite possible that this *esprit de corps* eventually led to the emigration of the ‘whole’ institute³⁴

In 1964, a conference was organized by the Research Institute for Mathematical Machines in Prague. According to Antonín Svoboda,³⁵ one of the highlights of the conference should have been the presentation of the new computer developed by his team, the EPOS. However, Antonín Svoboda was not present, and neither was his closest co-worker, Miroslav Valach, the author of residual class arithmetic for computers. Just before the conference, they succeeded to escape socialist Czechoslovakia for the West (eventually the USA). When

³⁰ *20 let gymnázia v Brně, Koněvova 47, 1957-1977*. p. 14

³¹ Kolomazník, Josef, “Úvodem”. In: *10 let střední všeobecně vzdělávací školy v Brně, Koněvova 47, 1957-1967*, p. 3. For the establishment of the special programming classes, Kolomazník refers to the Ministry of Education and Culture. In the yearbook *Gymnázium Koněvova Brno. 30 let. 1957-1987*, it is mentioned that in 1980s, there were five classes specialised in programming.

³² Interview with Marie Raichlová, April 2, 2009.

³³ Mařík, J., Vejvoda, O., “Aspirantský kolektiv v Matematickém ústavu (Postgraduate students group in the Mathematical Institute of the Czechoslovak Academy of Sciences)”. *ČPM* **78** (1953): 21-23 (in Czech).

³⁴ Martin Franc communicated this impression to me during a conference on 1958 screenings in ČSAV and at universities (Prague, December 10, 2008), saying that the Institute for Mathematical Machines was the only one in ČSAV where this happened.

³⁵ Interview with Antonín Svoboda conducted by Robina Mapstone on November 14 and 15, 1979. (OH 35, CBI)

Svoboda and Valach left the country, many of their colleagues followed them: “After A. Svoboda left Czechoslovakia, I focused all my energies only on getting a job abroad”, Ivan Dobeš, one of Svoboda's Ph.D. students says.³⁶

The conference³⁷ seems to have been a great success, judged from the proceedings.³⁸ The number of foreign (western) participants was impressive (a. o. Wilem van der Poel, Peter Naur,, and Maurice Wilkes). Among the 35 foreign participants of the 1964 conference in Prague, only a third came from the West, the rest coming from Comecon countries. Yet, from the program of the conference, it is apparent that the “eastern” guests³⁹ did not speak. Were they not invited to speak? Maybe the opportunity to ‘just’ listen to the western speakers was enough to bring them to Prague.⁴⁰

3. The "West" as the example to follow in the 1950s and 1960s

In Western Europe, the development of computing technology was very much influenced by the dominance of IBM. At first sight, the developments in the West and in the Soviet bloc appear to be very different, yet the influence of IBM as the leader in the field of computing technology cannot be denied either. It appears in jokes like “We do not need 3BM, one is enough” as well as in review publication *Výběr informací z informační a organizační techniky* (*News in the field of information and organizational technology*), a publicly available journal reviewing the advances of computing technology in the West and also, but to a much lesser extent, in the East.

IBM System 360 were the model computers for the Comecon common project to construct compatible set of computers. Compatibility of computers is an issue frequently

³⁶ E-mail from Ivan Dobeš, November 18, 2008.

³⁷ Bubeník, Vladislav, ed., 1965, *Information Processing Machines. Proceedings of a Symposium held in Prague on September 7th – 9th, 1964*. Publishing house of the Czechoslovak Academy of Sciences.

³⁸ Bubeník, V. ed., *Information Processing Machines. Proceedings of a Symposium held in Prague on September 7th to 9th, 1964*. Publishing house of the Czechoslovak Academy of Sciences, Prague, 1965.

³⁹ By ‘eastern guests’ I mean participants from the Soviet bloc, but not from Czechoslovakia

⁴⁰ To show one aspect of the irrelevance of distinguishing between an academic research institute and a research institute of an enterprise, it is worth noticing that the editor of the proceedings, Vladislav Bubeník, like most of the Czechoslovak participants, was an employer of VUMS, Research Institute for Mathematical Machines, which then belonged to the Ministry of General Machinery, but the proceedings were published by ČSAV. Most of the Czechoslovak participants were employees from universities, various enterprises, and research institutes.

encountered, once computers were spread more widely. As Jan Sokol explains,⁴¹ several levels of compatibility can be discerned in connection with computing technology: (1) technological compatibility of the peripherals; (2) compatibility of the data on media, (3) compatibility of the computer administration, and (4) compatibility of computer programs.

The Unified System of Electronic Computers hardware is known to have been copied from IBM; however, the same might not hold for the operating system, although the name (of the operating system) is similar. In a commentary to DOS (operating system) for EC 1030,⁴² the authors mention commands in both English and Russian, in a commentary to MOS for EC 1021, the notions are explained in Czech, but the abbreviations are made of English terms. There could be two obvious reasons for it: first, that the operating system was a copy of the original IBM one, but this is denied by the authors, and second, that it was easier to use English abbreviations, because the Czech ones might contain signs not included in the 26-letter English alphabet. The authors of the Czechoslovak version of the operating system for the Unified System computer EC 1021 namely claim that the operating system had to be better, because the hardware was worse,⁴³ so the operating system was also expected to cover up some flaws of the hardware.

While the humanities and social sciences were cleared of people who did not consent to the ruling party ideology, natural and technical sciences were not affected in this way: people who could not study the humanities would still often be allowed to study natural, exact, or technical sciences. By consequence, communities of people in these fields had higher percentage of people interested in philosophical questions and “world view issues” than the same groups in the west.⁴⁴ In the words of Ivan Havel: “Unlike in the humanities, relatively close contacts between ‘our’ sphere (dissident is too strong a word) and the sphere of

⁴¹ Sokol, Jan, 1973, Několik poznámek o kompatibility počítače EC 1021 (Several remarks on the compatibility of computer EC 1021). *Počítače systému RJAD. Příručka mechanizace automatizace administrativy* 6/1973, sheet 107 and 108.

⁴² Within the Unified System of Electronic Computers, the COMECON countries, to put it briefly, copied IBM machines: in the first phase, they took as their model computers the IBM/360 series. Originally, the Soviet-bloc names reflected the original IBM name; later, the name consisted of ‘EC’ the cyrilics abbreviation for ‘Unified System’ and a four-digit number. ‘EC 1030’ could thus be easily decoded as computer (10) made in the Soviet Union (3) in the first phase (0).

⁴³ Interview with Jan Sokol, April 16, 2009.

⁴⁴ Interview with Jan Sokol, April 16, 2009. František Novotný (1998), retired mainframe technician and science fiction writer, "The times of communism and germanium", <http://interkom.scifi.cz/1998/19980624.htm>.

official structures (meaning the people working in them) are frequent in the field of computing, as in other fields of technology and the [natural] sciences.”⁴⁵

Contacts with the West in exact, technical, and natural sciences were maintained throughout the period of Cold War. In the 1950s, they were supported even by the academician František Šorm, Secretary General of ČSAV from 1952 to 1962 and President of ČSAV from 1962 to 1969, one of the most powerful people in ČSAV. Contacts with the west in the field of technology were strongly supported by the ruling communist parties throughout the Soviet bloc: in Czechoslovakia, international trade fairs were organized in Brno since 1959, Raymond Stokes describes visits from GDR to Hannover fair; official support was given not only for travels within Comecon countries, but also to the West. Acknowledgment of Czechoslovak scientists in the West was positively accepted by the ruling party.⁴⁶

Observing the developments abroad and pointing out where Czechoslovakia was lagging behind was one, if not the main, aim of scientists' trips abroad.⁴⁷ For the same purpose, i.e. monitoring the advances in the field in the West, books were translated (mostly) from English, German, and French into Russian even without asking for copyright; important developments in the west were monitored in widely accessible journals.

Translation of influential books published in a technical field in the West was a common phenomenon. Copyright was not an issue in the Soviet bloc countries; and since Russian was the communication language in Comecon, a translation into Russian would suffice for potential readers even outside Russia. In connection with the translations, judgments on the state of the art of the race would appear, e.g. “they are ahead, but we keep the difference close.”⁴⁸ For example, Svoboda and Oblonsky went to the 1955 Darmstadt conference, where they presented papers on SAPO, the first Czechoslovak computer,⁴⁹ and met, among others, Howard Aiken, Willem van der Poel, and Heinz Rutishauser.⁵⁰

⁴⁵ Letter of Ivan M. Havel to F. Janouch, December 22, 1986, Prague. In *Korespondence*, p. 509 (The closeness of the two groups is important in connection with character sets on the computers: ‘ours’ should be the same as ‘theirs.’)

⁴⁶ As if good scientists, like good sportsmen, were part of the showcase of socialism.

⁴⁷ *Věstník ČSAV*, 1958, p. 60.

⁴⁸ Hoffman, *Digitale Informationswandler*. (The volume contains articles by Oblonsky and Svoboda)

⁴⁹ For more on SAPO, see Helena Durnova, ‘Sovietization of Czechoslovakian computing: the rise and fall of the SAPO project’, *IEEE Annals of the History of Computing*, vol. 32 (April-June 2010), pp. 21-31.

⁵⁰ Oblonský, Jan G., ‘Recollections’ – manuscript circulated in December 2008.

While the gap between East and West in terms of hardware production was widening,⁵¹ the situation in area of computing technology closer to science was different.⁵² Books and articles by Heinz Rutishauser, Bruno Thuring, Friedrich Bauer, Karl Samelson, and Edsger Dijkstra were available at least in Russian translation, if not in the original.

The reception of terminology in connection with computers, mostly of the English terminology in the programmers' slang during Cold War times and the adoption of Czech and/or Slovak terminology in the official publications, standing in contrast to the adoption of (transcribed) English terminology by the Russians indicates different approach of the two countries / nations. There was strong tendency to find a suitable Czech term, especially for published material, although at other points, Czechoslovak users were keen on using the 'appropriate' terminology with each machine, i.e. also French with French machines, German with German machines. LGP 30, for example, "spoke German", and thus it was perceived as German computer. English itself, as a language for programmers, but also a language of the greatest enemy of the Soviet Union --- the USA --- was positively promoted through and for the use of computers.⁵³

4. Conclusion of a sort

In the Soviet bloc, people often could not study what they had wanted for (often rather vague) political reasons. This especially applied for humanities (philology, history, philosophy) and social sciences (sociology, pedagogy, politology), law, and economics. As a consequence, technical universities and faculties of sciences provided a more liberal environment also for non-technical ideas, precisely because the political opinions of students as well as teachers were considered rather marginal. While concentrating on making the machine work, computer specialist were not bound by the official ideology. They could only express their opinion in a discussion with their fellow technicians, but their

⁵¹ Gerovitch, 2002, graph comparing number of types of computers and computer units in the US and the USSR.

⁵² Translations of Eastern work into English is also frequent: e.g. Kitov, A.I.; Krinitskij, N.A., *Electronic computers*. Translated from the Russian by R. P. Froom. English translation editor A. D. Booth (English) International series of Monographs on Electronics and Instrumentation. 13. Oxford etc.: Pergamon Press, VIII, 112 p. (1962). Zentralblatt 0103.10701

⁵³ Each university graduate should have at least passive knowledge of English. This was in sharp contrast in the number of students allowed to study in the departments of English and American studies In Prague, the capital, the department even had to be hidden under the cover of *Germanistik*. Also, early on, Russian was introduced as the first foreign language taught at primary schools (since the age of 10 or 11), with a second foreign language (usually German or English, sometimes French or Spanish) taught since the age of 15.

fellows had often chosen a technical subject for the same reason, i.e. because they were not allowed the subject they had wanted to official. Still, this subject (philosophy, history, ...) appealed to them and also, discussions with fellow technicians were quite open. By contrast, only ideologically correct ideas were allowed in officially published articles in the humanities and social sciences.⁵⁴ The case of computing technology is a special one also because of the enormous impact of this particular technology on our lives over the past decades. Furthermore, the subject itself, computing, is rather close to more philosophical considerations connected with cybernetics, artificial intelligence, etc.

⁵⁴ This is a simplification of the state of the affairs. As e.g. Slava Gerovitch in his , *From Newspeak to Cyberspeak*. MIT Press, 2002, shows, the writing, or 'manouvering', skills of each single person would also play a role in the acceptance of the argument by the ruling party. Also, the rigidness of the ideology varied over the 40 years of the rule of the communist party in Czechoslovakia.