TUG'95 at St. Petersburg Beach — a Personal View

Michel Goossens

Getting there

Saturday July 22nd. Brussels airport, hot, not enough head wind, and our DC-10 just stood there on the runway, waiting for that little breeze that would allow us to go up into the sky (it seemed the plane was too heavy to have enough velocity at the end of the runway to safely take off). We saw all those other planes fly off and our pilot must have thought, after half an hour or so, that what the other pilots could do, he could do also, and just after 12 pm we also became an albatross on our way to next year's host of the Olympic summer games, Atlanta. At takeoff the estimated arrival time was announced to be 15:26 pm local time, and with head winds between 60 and 100 km per hour we landed, believe it or not, at 15:24 pm.

Atlanta International; what an efficiency! I have seldom seen such a nice and well-organized airport. When arriving 30 minutes late in Atlanta, with only a one-and-a-half hour stop-over, and remembering Los Angeles Airport last year, where I had to wait almost one hour at immigration, I feared the worst. But, surprise, we got off the airplane, and it took only a five-minute walk through a new terminal building to a completely newly (re)built terminal, shiny and with new carpets, all like in those flashy brochures.

And then over thirty counters with officials on each one of them to receive foreign visitors. Before I even got to one of the desks it was my turn. I was greeted with a lot of sympathy and a hello by the immigration officer. He asked me what I was coming for, and when I told him I was attending a text-processing conference, he looked somewhat puzzled. 'Computers', I added. Of course, now he understood, since he was already entering my name into 'his' PC, so that by the time he inquired about the temperature in Brussels, and I myself about the local (Atlanta) temperature and the one in Chicago ('in the hundreds', he said, before I realized he was not talking about boiling eggs but Fahrenheit degrees), I was an official guest of the United States, to which he wished me a sincere welcome.

It was not before about 7 pm that I arrived in Tampa Airport, where Michael Doob was already waiting for me and from where, together with Sebastian Rahtz, who joined us a few minutes later, we took a 'limo' to Saint Petersburg Beach, the TradeWinds Hotel. On its forty acres this hotel complex contains several hundred comfortable rooms, many of them with a view on the beach and the Gulf, and optimal meeting facilities. Each room has (of course) air-conditioning, so that we could survive in the humid heat of around 100 degrees (equivalent to about 110 or 120 with the heat coefficient taken into account).

After checking in we had a quick meal in the 'Bermudas' restaurant, where we met with a few other 'known faces', like Christina Thiele, TUG's President for the last two and a half years, and Mimi Burbank, the local organizer for this year's Conference. It was with great pleasure (jet lag helping) that I went to bed around midnight.

Getting ready

The Saturday was spent setting up the computer equipment and preparing for the Sunday TUG Board meeting. The Board Meeting itself lasted the whole of Sunday, and a few important decisions were taken; proposals for improving the workings of TUG as an organization, and the coordination of the various user group activities were also discussed. At 7 pm there was the traditional TUG Conference Welcome Reception, where all conference guests had the occasion to meet each other and have a chat about TEX or other matters. It was a golden opportunity to break the ice (hardly necessary in that heat!) and to prepare the ground for fruitful contacts during the coming week.

Monday July 24th

Monday morning saw the official opening of the Conference, with TUG95 Organizing Committee Chairperson Mimi Burbank welcoming all participants before passing the floor to me. I had then the pleasure thanking everybody for coming, and underlined the different structure of this conference as compared with previous years — this time we would have more workshop oriented sessions (in the afternoons) and were opening up the area of presentations to the world of electronic publishing at large, and SGML/HTML, Adobe Acrobat, CD-ROMs, hypertext, etc. in particular. At that point I invited the representatives of NTG to say a few words about the third edition of their 4AllTEX CD-ROM, and Wietse Dol took this occasion to offer the first pressed CD to Donald Knuth who was guest of honour at this 16th (2^{2^2}) TEX Annual Meeting. I concluded my opening remarks by stressing that TUG was soliciting the collaboration of all those present to come and talk to members of the Board to give their input about the rôle of TUG. Sebastian Rahtz, as Program Committee Chair, then took over and presented the plan for the rest of the day.

The first talk was by Jiří Zlatuška, who showed how META-FONT and TEX can work together to typeset combinations of text and graphics. His new approach, based on TEX's extended ligature mechanism, reduces the number of META-FONT passes needed to one and also simplifies the TEX-METAFONT interface. This permits easier typesetting of text along curves and in particular allows one to generate beau-

tiful institutional seals and logos in various forms and combinations, starting from the same base elements. He noted that, although PostScript is often the first choice for including graphics information in TEX documents, METAFONT often offers improved legibility of logos and letters at smaller sizes.

The next speaker, Richard Kinch, discussed his work on building reliable PostScript Type1 and Truetype outlines for the Computer Modern fonts. He emphasized that several METAFONT primitives (stroked pens, overlapping ink) have no equivalent in these formats, since they support only non-overlapping Bézier curves. His program, MetaFog, handles most of the difficult problems associated

with these conversions, but he also pointed out some of its drawbacks. Richard made a plea for including hints inside the METAFONT sources, and ended by comparing his results to other outline instances of the CM fonts.

After refreshments Alan Hoenig gave another one of his almost 'perfect' pedagogical talks, this time showing how one can use Adobe's Poetica font set, comprising 21 fonts in two families, exploiting the possibilities of the virtual font mechanism. Alan showed us how his macro package, together with the font metrics generated by Alan Jeffrey's fontinst package, are able to typeset a sonnet by Shakespeare as though it were written in the most beautiful handwriting of a scribe.

One can never exaggerate the importance of documentation, and to teach first-year students the benefits of that approach an experiment was started at Texas A&M University by teaching Knuth's WEB system, that fully exploits combining code and documentation in the same source. It was found that students who had to mix program description and code acquired increased their problem-solving skills. They tended to analyse their problems not merely in relation to the programming language used, but in terms of the more general literate programming paradigm. Thanks to this increased awareness the students who took the WEB course were also more successful in grasping data structures and program development in general.

The morning session was concluded by Włodek Bzyl, who showed how, by extending Nowman Ramsey's generic literate tool noweb with a few stand-alone front-end programs, it became relatively easy to create a TEX-WEB system that is easy to understand for the novice user. The system is extensible by allowing customized styles and additional features. As an example he showed the literate source of plain.tex, the TEX source of Knuth's plain format, and proudly handed a printed copy to Donald Knuth, who browsed through it with great interest.

After lunch Sebastian Rahtz discussed a few advanced exotic features of Timothy van Zandt's pstricks package, that provides an easy interface between the PostScript and TEX languages, (pstricks's operating principles were described at TUG'94 — see TUGboat 15(3), pp. 239–246). The talk was a shortened version of a three-hour presentation by Denis Girou, a well-known pstricks guru, at the GUTenberg meeting on June 1st of this year in Montpellier (France). By using the electronic version of the slides, Se-

bastian could easily zoom in on sections of text and drawings. Fractals, complicated curves, such as cycloids (this is the first time that curves published in books on calculus showing such curves will actually be drawn correctly, Don Knuth remarked when seeing the beautiful and precise graphs), and three-dimensional multi-colour calendars were only a few of the graphics gems made possible by this approach.

Jerry Marsden introduced his FASTEX system, a library of standardized system-independent shortcuts for TEX commands. At present versions for Mac and UNIX exist. This approach speeds up the keying of input material and greatly increases the accuracy of the final text. Abbreviations exist for most of the well-know formats and extensions, e.g., the AMS packages. Commands can easily be edited or added. This approach is especially interesting in an environment where many non-specialist typists have to work together, since consistency and ease of input are important considerations in this case

After tea (served in the vendors' exhibit area, next to the conference room, where also books by Addison and Wesley and O'Reilly were displayed and software developers showed their products) Denis Kletzing showed how he uses his multi-enumerate package to handle complicated list structures. This environment handles narrow numbered list entries by bundling them into multiple columns. The drawback to the approach is that the user must specify the actual layout by typing the explicit position of the entry via different \mitem*ijk* commands, where i j k are column identifiers. With a little more TEX programming a lot of the positioning can probably be made automatic, but the approach shows that it is relatively straightforward to extend LATEX to cope with moderately simple but useful structures.

Jon Stenerson described the experience gained by using the style files he has developed for use with *Scientific Word* and which he described last year at TUG'94 (TUGboat 15(3), pp. 247–254). He thought that the basic ideas of his original approach were still alright but that most of them will have to be rewritten for streamlining and to better reflect his present thoughts on the subject.

At the end of the day the editors of journals produced by various TEX user groups presented and gave an overview of their respective publications, including problems each one had encountered. Ways of improving communication and mutual re-publication of worthwhile material were also discussed. A few weeks before the conference an electronic discussion list coordinated by Christina Thiele (TUG and former editor of TTN) and Gerard van Nes (NTG, editor of MAPS) had been set up, which allowed the editors to exchange valuable information.

Presentations were made by Sebastian Rahtz (editor of UK-TUG's *Baskerville*), Michel Goossens (for Jacques André, editor of GUTenberg's *Cahier GUTenberg* and *Lettre GUTenberg*), Christina Thiele (former editor of TUG's *TTN*), Luzia Dietsche (editor of DANTE's *Die TEXnische Komödie*), Gerard van Nes (editor of NTG's *MAPS*), Wietse Dol (editor of the EuroTEX95 Proceedings), Barbara Beeton (editor of *TUG-*

boat), and Włodek Bzyl (editor of GUST's *Bulletin*). From the various talks it became soon evident that most of the problems encountered were common to most user groups' publications, often with an extreme dependence on a single individual, so that, when s/he is unavailable the whole production process suffers. Several editors commented that a production team of a few individuals seemed the only way out of this situation, to ensure that issues would be produced at more or less regular intervals. Other themes were the difficulty of finding authors and volunteers to proofread, correct and edit the articles. All in all, editing a journal is a non-trivial task and involves the dedication and hard work of a lot of individuals. As Jacques André summed it all up: 'An editor is like an organist at Sunday mass: if the music is good, no one hears it; if it is bad, everyone cries.' At the end of the session Gerard presented the unique MAPS awards to Christina Thiele for her many years as TTN editor and to Mimi Burbank for her hard work organizing the TUG'95 Conference. It is to be noted that several issues of the various user group publications were on display in the vendors' exhibit area.

Tuesday July 25th

As Donald Knuth only rarely attends TUG conferences these last years it was a real pleasure to have him with us at TUG'95 and we gave him the floor for the first part of the morning. After answering the 'usual' first question — when is volume four of *The Art of Computer Programming* coming out? it will be published over several years in 128-page fascicles coming out twice a year — he talked at length about TeX and how he would do it in basically the same way if he were to start over today. A more detailed account of Knuth's presentation will be published elseware based on notes taken by Christina Thiele.

After the break John Hobby, the author of MetaPost, gave a live demonstration of his program which is now used by Knuth himself to prepare the graphical material of his books. MetaPost implements a picture-drawing language similar to Knuth's METAFONT, but it outputs PostScript commands instead. Moreover, it gives access to all features of PostScript and allows easy inclusion of text and graphics (for more details on MetaPost see the user guide available on CTAN, or his introductory article in the EuroTeX92 Proceedings, pp. 21–36, Prague, Sep. 1992).

The last set of presentations were about 'future systems'. First Robin Fairbairns presented an introduction to Unicode. He reviewed the winding road from 6-bit propriety codes for encoding information on

computers, to 7-bit ASCII-like codes, then to 8-bit EBCDIC and ISO standards 8859-xx, specific language encodings, the 16-bit East-Asian JIS, GB, KS and Big Five codes, to Unicode and 32-bit ISO 10646 (for a detailed discussion of questions of encoding and multi-linguism see, e.g., *Cahiers GUTenberg* 20, pp. 1–53). It should be noted that Unicode is the internal encoding used by Haralambous and Plaice's Ω program, a 16-bit extension of TeX (*TUGboat* 15(3), pp. 320–324 and 344–352). Jiří Zlatuška then brought us up-to-date on the e-TeX project, the first version of which had just been distributed

to developers. Peter Breitenlohner complemented Jiří's talk with some more technical details on e-TeX. It all sounds like an interesting development. In fact, I made the remark that the Ω and e-TeX approaches address quite different needs and in the long run a collaboration between the two projects might be an interesting idea. In the absence of representatives of the Ω team this point was not pursued further.

During the first part of the afternoon Wietse Dol showed how easy it is to use the 'plug-and-play' 4allTeX CD-system for PC's. An interactive live presentation showed the ease with which the system can be installed from the CD, and also how applications can be run.

At about four o'clock we left for Tampa, where we were booked on the Starlite Princess Riverboat for an evening Cruise starting at 7 pm. The original plan was to visit also the large Florida sea aquarium, but since we arrived there only half an hour before closing time few wanted to pay the rather expensive entrance fee. So we just spent the time talking about this and that, TeX and not-so-TeX business up to about seven, when we were invited aboard. I had the pleasure of sitting opposite Don Knuth, and during the evening we had an opportunity to discuss such hot topics as electronic documents and how to take maximal advantage of the initial investment of marking up the document in TeX to produce optimal output for viewing on the Web (the subject of one of my talks later during the week). Don also told me that all his articles and reports on various subjects are being re-edited by Cambridge University Press (the first volume *Selected Papers on Computer Science* is due out in October 1995). Tampa by night, seen from the water, with a nice sunset in the cloudy sky (it had been raining all afternoon, like most of the other afternoons later in the week), was an unforgettable experience. Good sailing, many people on the upper deck in the breeze, others dancing, with Tom Rokicki and his lovely wife, in particular, giving a demonstration of supreme dance TeXniques.

Wednesday July 26th

Mark Swift was the first speaker of the day and in his talk *Modularity in LaTeX* he explained that LaTeX should be built in a highly modular way. In particular an abstraction of functional modules not mapped onto filenames would be an important point, as shown by recent discussions on the LATEX3 discussion list, where the 'forced' uniqueness of filenames in the basic LaTeX distribution, e.g., `article.cls`, was questioned. The speaker proposed some possible extensions to TeX and discussed his work on the `frankenstein` package, which adds certain kinds of modularity to LaTeX.

Bart Wage of Elsevier Publishing in Amsterdam gave an interesting description of how they handle journals, from source copy to printed/electronic document. Text is converted into SGML, figures are kept in various formats (e.g., TIFF, JPEG) and LaTeX sources are also translated into SGML using Elsevier's in-house DTD. LaTeX allows for easy typesetting, but it has no formal DTD, making extensive tagging somewhat difficult, while SGML allows for a formal DTD, where explicit tagging of all document elements with respect to that DTD is possible (formal specifications exist for math, tables,

bibliographic material, etc.), so that SGML is ideal as an exchange format between different source representations. All documents are translated into SGML and stored in the 'Warehouse', which forms the common repository for the various further uses of the documents. This is extremely important for electronic documents, where re-use and structure-awareness are of prime importance. Bart emphasized that a journal is not just a collection of articles, but a real web of cross-links to related topics and references, and the future of publishing lies in the optimization of these facilities for all potential users.

Pierre Mackay then read a paper on *Modern Catalan Typographical Conventions* written by Gabriel Valiente Feruglio, who could not attend. It was an interesting journey in search of typographic rules for scientific Catalan texts. The author complained that no normative typographical conventions existed for his language and then went on to propose a set based on his study of several reference texts. Finally he introduced a set of possible TEX definitions implementing these rules.

After coffee Petr Sojka gave one of the best technical papers of TUG'95 — Petr got the 'Knuth' prize of the Conference for discussing something important that Knuth noted he had not thought of when developing TEX. The paper was a follow-up to a talk on the problems of hyphenation with TEX that Petr gave in Gdansk last year (see the EuroTEX94 Proceedings pp. 59–68). This time he discussed the problems of hyphenating long compound words, which occur very often in German, Dutch, and the Slavic languages, since in these languages the constituent parts are not signalled by a hyphen or other fill character. This makes it often difficult, if not impossible, to hyphenate words correctly. Therefore Petr was suggesting extensions to the hyphenation algorithms of TEX to successfully treat such cases and he discussed in a generic way which basic functionalities would be needed. Perhaps something to be implemented in (one of) the 'successor(s)-to-TEX', he commented (and Don seemed to agree).

The last talk of the morning was by Sebastian Rahtz, who discussed various ways of translating LATEX sources into SGML. His presentation was a perfect complement to Bart Wage's earlier that morning. After working on the conversion problem for several months, Sebastian came to the conclusion that the only foolproof way is to use TEX itself to output SGML, a solution proposed by ICPC, a software company in Dublin. He is actually using an intermediate approach, (pioneered by Sebastian and myself at CERN), which translates most LATEX commands into SGML by redefinition of macros, and then extracts the text from the DVI file. This system copes with almost all LATEX commands (including math).

The afternoon had presentations by conveners of various working groups. First Norman Walsh presented the work of the TDS (TEX Directory Structure) working group. He explained the rationale of the choices made, emphasizing that one of the basic constraints had been ISO-9660, which (only) allows for directories down to eight levels and limited to '8+3' case-insensitive names for files (for DOS users this will come as a blessing, I am sure). Since not all TEX engines support an optimized recursive directory search, major attention has been paid to propose an efficient structure that minimizes

reductions to efficiency while searching for package and font-related files. It was emphasized that a production run-time directory structure such as TDS is different in nature to an archive, e.g., CTAN, and that the two cannot be married easily.

Tomas Rokicki and Michael Sofka then discussed the work in the DVI-Standard Committee, especially the standardization of the various `\special` commands, which had been discussed by an extremely active and interested group of implementors who had met over several of working breakfasts and lunches.

I think that real progress was made in this area where a normative syntax had been awaited for all too long. I am very grateful for the enthusiasm shown by these people, and am convinced that we shall see their work bear fruit in the near future (Tom told he will be working actively on his program `dvips` over the next few months, so that we can be sure, knowing Tom's reputation, that many of the hyper- and other goodies discussed during the conference, will become part of this, and other popular dvi-drivers).

After the refreshment break T.V.Raman gave a practical demonstration of his ASTER system, which allows one to 'hear' LATEX sources, including mathematical formulas, to be read out. His system uses a speech synthesizer that, via an augmented emacs editor running with camLisp, is able to analyze, decode and then transcribe into audible form well-structured LATEX documents. This last remark is extremely important since, as already pointed out by Sebastian Rahtz in his talk earlier that day, due to the various (ambiguous) ways that mathematics can be coded in TEX, there exists no automatic way to parse such TEX source into something usable more generally, such as SGML or audible sound. This was the loudest plea yet for using well-structured markup.

Between the general sessions of the day and the Conference dinner, the editors of the various TEX-related magazines had a second meeting to discuss ways of collaborating and supporting one another, as a group of editors rather than individual editors, each on their own. It was decided to write a short overview of the experiences of each team for TTN, to provide cross-references to one another's publications on the user groups' respective WWW pages, where tables of contents of the magazines will be posted (in fact, GUTenberg has already decided to make freely available on the Internet via WWW, all articles — initially in PostScript form only — of the *Cahiers* and *Lettre GUTenberg*). It was also proposed that all non-English publications try and provide an abstract in both the local language and in English, so that these abstracts can be published in TUGboat (or elsewhere). Editors were also asked to signal potential articles that might be interesting for translation into English and publication in TUGboat (of course, editors can translate articles from TUGboat into their national language, as well!). Presently, CSTUG, GUST, GUTenberg, NTG, TUG, and UKTUG are working on a TEXART CD-ROM that will make the publications of those user groups available on this electronic medium (and on the Web). It was also agreed that each author should be asked permission to reprint her/his article(s) in this way. During the

meeting Gerard had the pleasure of offering the third MAPS award to Barbara Beeton, the most senior and long-standing editor present, for her 16 years of efforts to make *TUGboat* an example of the typographic quality that can be achieved with TEX.

At seven all conference guests were invited to the Conference Dinner. Another occasion to socialize and talk to many people in an informal way. It is on these occasions of direct personal contact that one can get a first-hand idea of what the basic TEX user and TUG member thinks, feels, and would like to see happen.

At the end of the dinner, an event took place which truly inspired the conferees. Sebastian had been playing with the idea of somehow linking the TUG meeting with the upcoming EuroTeX'95 meeting — a way to pass on the excitement, as it were, from one group to the next, and to show the support of TUG for all TEX users worldwide. The answer? An auction!

Around nine o'clock, the intrepid Dutch duo of Gerard van Nes and Wietse Dol got up, and as the room grew silent, they announced that the TEX-related books, generously offered by Addison-Wesley, would be auctioned to collect money for financing the 'EuroTEX' bus. The NTG are organizing the EuroTEX95 conference in Papendaal (Arnhem, the Netherlands) from September 4th to 8th, and they've introduced a wonderful innovation: hire a bus to gather participants from Russia and Central Europe, and bring them to the conference at minimal cost! As an added incentive to the captive banquet audience, Donald Knuth graciously agreed to put a personal dedication in each one of them, and Wietse, the editor of the EuroTEX95 proceedings offered a free copy of the proceedings to the two highest buyers!

Thanks to the exceptional flair demonstrated by Gerard and Wietse, this first-ever auction of books at a TUG meeting soon turned to delight as unexpected bidding made for great fun and laughter. One of the highlights of the bidding was the 'fight' between Bart Childs and Judy Johnson, vying for the three volumes of *The Art of Computer Programming* — at one point the bids were for $310, then $314.16, but Bart took it away finally with $316.00! After I let these three famous volumes escape, I concentrated on the 'big one', namely the five volumes of *Computers & Typesetting*, which became mine for the nice little round sum of $700. Adorned with a dedication from Donald Knuth this will remain one of the treasures of my personal library!

The auction was an outstanding success and over $1800 were collected. Many thanks to Addison-Wesley, who donated the books. I also want to express my gratitude to the two auctioneers, Gerard and Wieste, who were so efficient at times that, on one occasion, the efforts of one of them to push up the price of a book resulted in his bid being the final one!

Thursday July 27th

In his presentation T.V.Raman gave an overview of ASTER — an Audio System For Technical Readings — the system he had demonstrated the day before. ASTER transforms LATEX documents into an audio text, so that the visually impaired can 'listen' to the contents. Raman emphasized the importance of the use of clear generic markup for the input source document to ease the extraction of logical structural logical information that can be easily translated into an internal representation. ASTER then renders information by applying rendering rules written in AFL — Audio Formatting Language — to the internal representation. In a sense AFL is to audio formatting what PostScript is to visual formatting (although AFL is by far not as complex). In conclusion, Raman emphasized that one needs a semantic-oriented DTD to produce a high-quality audio document. Since no such completely general DTD can be constructed one has to use the facilities provided by LATEX and its hyperTEXt extensions.

Mark Doyle reviewed the purpose and history of the Los Alamos preprint server, that is one of the first (and more successful) document servers on the Web. In fact the work started in the area of (theoretical) High Energy Physics and took place in close collaboration with CERN (where WWW was invented). Today several tens of thousands of preprints are available online and over 20,000 users access the server each day. Although up to now most documents were only available as (mainly TEX) source and standard PostScript, more recently one has started to produce PDF versions that include cross-references to other documents on the Web using the `hyperTEX` tool and PDF's `pdfmark` command. In this way cross-references to other documents can be easily instantiated.

During the next half-hour I gave an introduction to Nikos Drakos' tool `latex2html` and showed how by simple customization the visual quality of the output HTML files can be substantially improved. I went on to show how the `latex2html` system also allows for interconnecting separate documents. I ended with a few examples of HTML3 output generated by an ad-hoc program developed at CERN and viewed with the HTML3-capable `arena` browser.

After the break Sebastian Rahtz showed how with his `hypertex` package (sharing some code with the `HyperTEX` package discussed earlier by Mark Doyle) it is easy to turn LATEX documents into hyper-documents. Their 'hyper' contents can be enriched by adding supplementary information about LATEX's cross-references via `\special` commands. These are picked up and translated into PDF's `pdfmark` commands by the 'hypertext' `dvihps` program, an extension to Tom Rokicki's `dvips` program. Tom stated that these extensions will end up, in one form or another, in the forthcoming upgrade of standard `dvips`.

The afternoon started by a second presentation of the *4AllTEX* system, and, as always, there was great admiration amongst all those present for the ease with which it is possible to 'plug and play', i.e., start to setup and run the system without much ado. It became all the more evident that such a CD-ROM for UNIX is a real need, and a recurring proposal for the next great thing that TUG should come up with (and we are surely thinking about a way to get this done).

During the next hour I gave an introduction to SGML using HTML as an example of a DTD, and showed that it is not

difficult to understand the structure and syntax of a DTD, and from there to figure out the various possible document elements, their attributes and the entities that are available to the user. Work on other DTD's for mathematics and tables was briefly mentioned, as were a few tools for authoring and checking SGML documents. I came away with the feeling that at the end of my talk most of the audience had a more balanced view about what SGML is, and what it is not. I therefore hope that my presentation will also help eliminate most of the artificial animosity between the SGML and TEX worlds. As Sebastian, myself and a few of the other speakers tried to show, SGML is about structure, and TEX about typesetting, and the two tools are therefore complementary and both useful.

Chris Hamlin, in the last scheduled talk of the day, described the production work at the American Physical Society, including the use of ReVTEX. As expected, it is similar in content, form, and structure to what we have heard from other speakers (from Elsevier at this conference, or from Springer, OUP, and so on at other conferences); namely, that a mixture of TEX and other word-processor inputs are accepted by the production team. The proportion of TEX sources varies wildly between publications (from almost nothing in the chemical journals to well over 50–60% in some of the physical journals). Various house styles are available, and at present ways are being investigated to translate the inputs into SGML to take full advantage of electronic publishing tools.

The last part of the afternoon was for the TUG Business meeting, which will be the subject of a separate report.

Friday July 28th 1995

Already Friday. It seemed as though the Conference only just started, but the bags at the sides of the room and the now-empty vendors' room made us realize that we were here for only another few hours.

The morning started with a paper submitted by Jonathan Fine and read by Alan Hoenig in Jonathan's absence. The title was *New Perspectives in TEX Macros* and dealt with a possible way of combining the advantages of both SGML and TEX. His TEX macro package SIMSIM takes SGML and style files as input and generates pages formatted with TEX as output. SIMSIM comes with an SGML parser and the style files are used to link TEX actions to SGML events. The SIMSIM system also offers a programming environment for writing TEX macros and style files. At present issues of performance were not addressed directly but on sample documents the speed was comparable to that of LATEX. All in all an interesting idea, and I look forward to seeing Jonathan's finished product soon.

Sergey Lesenko then told us about his *t1part* tool that partially embeds Type1 PostScript font files into a document. The principle is to include the PostScript code for only those characters that are actually referenced. This can result in huge savings in size if one uses only a few characters from many fonts (the procedure is based on the same model that includes only the necessary Type3 bitmaps for characters built with METAFONT). Tom Rokicki and Sergey have been working

together over the last few months and this facility will be built into the next version of Tom's `dvips`. I mentioned that Basil Malyshev has a somewhat similar utility `fload`, that uses the publicly available `ghostscript` program to make a map of all referenced fonts and then includes only the characters needed. Basil's approach can be used for any kind of PostScript file, so that it is complementary to Sergey's that is well integrated with TEX and needs no supplementary external program. During the discussion there were some interesting remarks on copyright issues connected with including Type1 fonts inside documents. It was felt that, although partial font loading would make pirating fonts less effective, it does not mean that all font vendors would agree to let one include their fonts in this way in files distributed electronically (on CD-ROMs or the Internet). To be continued...

A more technical talk, on METAFONT this time, was Jeremy Gibbons' presentation *Dotted and dashed lines in META-FONT*. He showed that drawing evenly spaced dotted and dashed lines in METAFONT is a non-trivial task, and he proposed several solutions to make it possible. He introduced the notions *evenly spaced in time* as opposed to *equally spaced in space*, and went on to show that they are far from identical, since points can move at different 'speeds' in space as they progress evenly in time along a path. Using recursive adaptive refinement techniques he showed how one can solve the problem in METAFONT. His procedure can be extended to allow for dashed, or alternating dashes and dots. As recursive techniques have the unwanted feature that they can overflow the stack, Jeremy also proposed a solution based on an iterative non-adaptive technique that, although perhaps less elegant and automatic, does the job almost equally well. At the end of his talk he showed several attempts at drawing an attractive muskrat, the logo of the *Mississippi Muskrats* jazz band he used to play in, and the original motivation for him trying to solve the problem!

The last scheduled talk was by Robin Fairbairns. After explaining the principles of the PostScript multiple master Type1 font format, Robin showed how a crude first system of using these fonts with TEX was set up. All font instances are expressed as a function of weights with respect to the master designs. These weights are calculated by the Post-Script interpreter from the design parameters via the Post-Script operator `ConvertDesignVector`. Version 3.x of the `ghostscript` program was used to extract the weights, which were then used to generate the Adobe Font Metrics (AFM) instances from the AFM files for the master designs. Then Rokicki's `afm2tfm` program was run to generate corresponding tfm files needed by TEX, while a header file was also defined to allow `dvips` to actually specify the font instances from the weightvector. This set up was used to typeset the June 1995 issue of UKTUG's magazine *Baskerville* in Minion, one of Adobe's Multiple Master fonts.

The morning ended with the 'Closing Ceremony' and the announcements of the TUG95 prize winners.

Christina Thiele, as vendor and public-relations liaison, thanked the various companies who had participated in various ways to the TUG95 conference, in particular Addison-Wesley

for the books they had donated (and that were put up for auction on the Wednesday evening for the EuroTEX95 bus, and still a few left for another promotional idea we are playing with. Stay tuned to TUGboat and TTN!). Other of companies that we are indebted to are Blue Sky Research, Carleton Production Centre, Elsevier Science, Kinch Computer Company, New Horizons/Comp USA, O'Reilly and Associates, PTI, TCI, and Y&Y. Christina also acknowledged the contribution by the French speaking TEX user group GUTenberg of $1000 to the TUG'95 Bursary. Our sincere thanks to each one of them for their contribution to making TUG'95 a success. I sincerely hope that TUG will be able to count on their continued support in the future.

Mimi Burbank, as Chair of the Organizing Committee, thanked all the people at SCRI who helped her financially and organizationally, by providing computers, a printer, and the use of their bus to transport it all. She also mentioned the excellent work of Dwayne Bibby, whose two 'Lion' drawings were used on the t-shirts, the preprints, and the mugs. She also thanked the extremely efficient hotel staff for their never-ending devotion to a job well-done. Finally she expressed her gratitude to all members on the TUG'95 Conference Organizing Committee for their never-ending efforts to make TUG'95 a success.

Sebastian Rahtz, the chair of the Programming Committee, then announced the prize winners for TUG'95. Just before coffee that morning all participants had been asked to write down an ordered list of the four papers they liked most, and on the basis of that list it was Raman who was selected as best presentation, best paper and most important contribution to the TEX world ('and humanity', one wrote). Raman (and his guide-dog Aster) received a remarkable standing ovation when UKTUG's Cathy Booth Prize was awarded to him. We asked Don Knuth to also select a paper, and Don chose the work of Petr Sojka on hyphenation, stating that Petr's paper discussed something that he 'forgot' in his TEX program. Other prizes went to Richard Kinch for MetaFog (who put his prize copy of Textures up for sale, so that the EuroTEX bus again received more support), Alan Hoenig for his marvellous Poetica work, Jeremy Gibbons for his entertaining and erudite explanation of METAFONT, and Sergey Lesenko and Tom Rokicki for partial font downloading, and work on DVI standards. Many thanks are due to the fine TEX vendors Blue Sky Research, Y&Y, PCTEX, and Richard Kinch, who generously donated copies of their products for the prizes.

Of course we did not forget our friends from NTG, without whom this conference would not have been the same. Their *4AllTEX* CD-ROM was one of the highlights at this conference (they sold about 40 copies, and the remaining 60 were taken to the TUG office for selling them to the North American TUG community). Their presence, good humour, the organization of the book auction, the coordination of the TEX-ED initiative, and the hundred or so photos they took, made them a memorable and unforgettable part of this meeting. Therefore a signed copy of the METAFONT book was donated to Wietse Dol. In a gesture underlining their dedication to TEX and TUG Wietse then offered TUG the two golden (original) CD-masters of the third edition of *4AllTEX* that had just been released. I had the pleasure of accepting them on TUG's behalf and I promised that they would be framed and displayed in a prominent place in the TUG office in San Francisco. The gifts were concluded with the UK TEX Users Group and TUG presenting 2 bottles of wine, and 2 boxes of chocolates, to Don Knuth, maintaining the '2' theme begun by NTG's 2 CDs at the start of the conference.

Finally it was my duty to formally end the TUG'95 meeting, and after thanking Knuth for his presence, which made this 2^{2^2}th meeting even more special, I reiterated the thanks to all vendors, SCRI and the hotel staff, for their display of (southern) American hospitality. I also thanked all those present for having attended the meeting, and especially all those who had worked so hard for making this meeting a success, in particular Christina, Mimi and Sebastian. Then I invited all participants to the next (17th) TUG annual meeting in 1996 in Dubna (Russia, 150 kms north of Moscow, on the Volga River), where from July 28th to August 1st TUG'96 will be hosted by the Joint Institute of Nuclear Research.

During the afternoon Alan Hoenig gave a practical introduction on the use of virtual fonts. He showed how they can be used to create new characters as various combinations of glyphs and rules. He described how Alan Jeffrey's `fontinst` package allows one to easily install PostScript font families for use with LATEX2_ε. In his usual pedagogical approach Alan made it all sound as though it is extremely simple and straightforward, and all fifty participants to this last 'event' of the conference came away with the feeling they were ready to generate some virtual fonts themselves.

Going home

Together with Michael Doob I left the TradeWinds Hotel around noon on the Saturday. I was flying Delta Air to New York at 2 pm (and Michael was taking a flight for Canada about two hours later) and from there to Brussels. Due to engine trouble I did not quite make it to Belgium as planned and I had a very-enjoyable extra day in the Big Apple. But that is another story — one about the delights of modern air travel. . .