TeX entomology in 2021

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Our peerless Ur-Wizard asked me to write a few words about the filtering and testing process for this year's TeX tuneup, which I am glad to do.

First, I am beyond grateful to the many other people who volunteered to help with the job, and without whom it would have been an impossible task: for TeX, Donald Arseneau and David Fuchs; for METAFONT, Bogusław Jackowski, Piotr Strzelczyk, and Jerzy Ludwichowski; and for everything, Barbara Beeton, who was Don's entomologist "from the beginning" until this cycle. She still read every bug that came in, and provided much useful history and advice. For many years, Peter Breitenlohner, who sadly passed away in 2015, and Chris Thompson were also key members of the group of vetters.

As some sort of bonus to the hundreds of bug reports for TeX & METAFONT that I sent to Don this year, I also sent a dozen or so reports on CWEB, for which I relied on Andreas Scherer to confirm and elaborate. Andreas is the creator and maintainer of the `cwebbin` descendant of CWEB now used in TeX Live; as has been more widely announced elsewhere, Don asked Andreas to take over as the maintainer of the official CWEB as well.

How bugs are reported: Anyone can send reports either to the public mailing list `tex-k@tug.org` (`lists.tug.org/tex-k`), or to me personally if they want to retain privacy. This is described both on Don's web page (`www-cs-faculty.stanford.edu/ ~knuth/abcde.html#bugs`) and on the general information page I created for bugs in TeX & METAFONT, `tug.org/texmfbug`. This worked out well, with a number of incoming reports on `tex-k` being answered by people other than me, a most welcome outcome.

After some initial triage by me (some reports had been fixed in later printings, etc.), I sent reports to the appropriate vetters for discussion. Many could be easily confirmed, such as obvious typos — but even there, one of us typically searched all the books and other WEB sources for the same typo, since so much material is copied around the TeX system. Occasionally these searches resulted in bug reports for the few `.web` files not maintained by Don, notably Oren Patashnik's BibTeX and Tom Rokicki's PKtype and PKtoGF, which I directed accordingly.

Other reports took hours of analysis to determine the root cause, and/or the details of what we could sensibly suggest to Don, if anything. The champion in this regard was perhaps Sophie Alpert's bug about the treatment of Inner atoms in *The TeXbook*, which Don mentioned in his report. Here, we enlisted Udo Wermuth's expert help in checking if we were on the right track with the myriad issues that arose.

One of the most useful checks for all code (as opposed to textual) bugs was possible due to David Fuchs, who has implemented a complete build system, including a runtime library, which can compile and run all of the original WEB sources without any change (files) whatsoever. This made it possible to definitively determine whether some particular strange behavior was due to the Web2C or other infrastructure, or was truly in the original source. DRF discusses the system in his article published in *TUGboat* 41:1, also available at `tug.org/texmfbug/fuchs-knuthbug.html`.

Thanks to Robin Laakso in the TUG office and long-time TeX colleague Oleg Katsidatze, the original printed reports with Don's handwritten comments have recently been sent back to everyone who provided physical addresses. In case of physical mail being lost, we have a scan of all the paper and can resend copies.

Looking ahead, I plan to record new confirmed incoming bugs, to be reviewed in the next tuneup, at `tug.org/texmfbug/newbug.html`, so potential reporters can more easily check for known bugs. A sibling page, `tug.org/texmfbug/nobug.html`, lists a few especially noteworthy non-bugs; it's not practical to list every declined report, but publicly listing the most significant ones seems worthwhile.

In the `\end`, coordinating these bug reports has given me a whole new level of appreciation for the TeX system. Don, thank you for creating it, and giving it to the world.

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    https://tug.org/texmfbug