Zoo Story
How the SHARP APL Development Group Got Its Name

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Abstract

Once upon a time, there was a high-tech Canadian company, called I.P. Sharp Associates. This was in the days before the phrase “high-tech” had been coined, and few people knew what an amazing and wonderful thing it was to be associated with so many intelligent, generous, and thoughtful people. Few of us thought of it as “work”. This talk presents some of my early encounters at IPSA.
The Picture: 1970

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- Pre-Cambrian hardware
The Picture: 1970 Hardware

- Pre-Cambrian hardware: dinky IBM S/360 Model 30
  - 8KB memory
  - 1401 emulator (hardware)
  - card reader/punch (Read 1000/minute, punch 250/minute)
  - paper tape reader (1000 characters/second!!)
  - line printer (600 lines/minute = ten pages/minute)
  - no console
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- Pre-Cambrian hardware: bigger IBM S/360 Model 30
  - 32KB memory
  - very slow card reader
  - no printer
  - no console
  - tape drives & another tape controller
  - disk drives (8x29MB)
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Proposed Hardware/Software Improvements

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- Eventually, boss’s boss’s boss heard about it, & approved idea
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- Off to the headhunter
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rdm said, offhand, that he was willing to hire me.
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- rbe hand-codes several (hundreds are needed) unit tests
- rdm suggests I use APL to generate unit tests and check results
rbe learns APL: 1971

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► rbe, bemused: “I could write a program to do that..."
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- dlf: “I just did."
- Later, I got the idea that APL was not just a one-trick pony, & learned APL
rbe Becomes an Implementor: 1971

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- rdm: “Fix it.”
- rbe: So I did, designing (mostly) linear time algorithms:
rbe Becomes an Implementor: 1971

- My first published paper eventually appeared in 1973

Figure: Cover of APL Congress 1973, Copenhagen
My First Published Paper!

► Computer-typeset, no less!

Figure: First page of article
The Amsterdam Connection

- The Intersystems office at 244 Herengracht

Figure: The Intersystems Office at 244 Herengracht, Amsterdam
Michael Harbinson: IPSANET packet switching, pre-internet
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- rbe and others: Siemens APL implementation for BS2000 OS
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Finding Hardware Problems, circa 1978

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- rbe redesigned *reverse* & *rotate* for performance & nested array support
- rbe, seeking ego boost, compared old vs. new versions with new timer code
Finding Hardware Problems, circa 1978, user load 500

- 50 milli-CPU units = 2.85msec
Finding Hardware Problems, circa 1978, user load 500

- 50 milli-CPU units = 2.85 msec
- Hey, what is that jitter and those spikes?

Figure: Ooh...faster, better, pretty pretty!
Finding Hardware Problems, circa 1978

Let’s zoom in

**Figure:** Wow! One spike = 10000-element reverse!
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- It became evident that the V6-II architecture was not going to get fixed.
- So, we gave each workspace slot its own key, at APL startup
Finding Hardware Problems, circa 1978

- SHARP APL: many user workspaces in memory at once
- SSK isolated interpreter bugs to a single workspace
- I traced spikes to the Set Storage Key (SSK) instruction
- Disabling SSK made spikes disappear!
- New Amdahl V6-II had larger cache, with much slower SSK
- rbe met with Gene Amdahl to discuss the problem & possible solutions
- It became evident that the V6-II architecture was not going to get fixed.
- So, we gave each workspace slot its own key, at APL startup
- Slightly less system integrity, but problem solved
IPS A Happenings, early 1970s

- 1971: 666 box: email before internet, written by Larry Breed
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IPSA writes STAR APL for Control Data STAR-100 supercomputer
IPS Expansion, early 1970s

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- JIT: rbe, Greg Bezoff (gbe), Doug Forkes (dlf) implement various verbs & conjunctions as JIT code
Time Marches on

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  < — — — — SUITS    JEANS — — — — >
Time Marches on. Again

- Ian Sharp wanted to give people “an interesting place to work”.
Time Marches on. Again

- Ian Sharp wanted to give people “an interesting place to work”.
- He did that! Thank you, Ian, for your great vision and spirit.
Lost client saw feral developers; exclaimed “This place is a zoo!”
Time Marches on. Further

- Lost client saw feral developers; exclaimed “This place is a zoo!”
- The name stuck, even unto the email address
Lost client saw feral developers; exclaimed “This place is a zoo!”

The name stuck, even unto the email address

So, with apologies to Albee, I can truly say: “I’ve been to the zoo!”