

From Byron to the Ada Language

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Two topics

Byron and Babbage at Cambridge

Why is a language called Ada?

Not ADA = American Dental Association

Lord Byron

Went to Trinity Cambridge

Went up in July 1805

Graduated MA in 1808

Being a Noble, did not take maths Tripos,

but dined on High Table

Bruin the Bear

Byron wanted a dog, but not allowed by college statutes.

So he had a bear instead. Did he keep it in college?

According to Wright (another Trinity man) in his book *Alma Mater* (1827), Byron had a room in K staircase, Great Court and kept Bruin at the top of the "hexagonal" turret.

affection. When Lord Byron was at Trinity, he kept in rooms on this staircase, round which you might drive a coach and six, and had, moreover, the use of the small Hexagonal one in the tower. His

Great Court from K staircase



The turret at K

Bear at top?

Now a toilet

Turret is not
hexagonal.

Best room is K6.
Did Byron live
there?



Maybe not quite true

Byron did keep a Bear, probably outside college in Ram yard with his horses.

Maybe he and bear were in K as temporary measure.

Byron seems to have achieved little academically but wrote some poetry and generally had a good social time. Was thrown into the fountain.

PS Lady Butler around 1970 had a pet that looked remarkably like a dog but was classified as a cat.

Babbage

Also went to Trinity in 1810. Read maths. Moved to Peterhouse in 1812.

Offended examiners at viva and did not take exam. Maybe deliberate - did not want to be beaten by Herschel.

Herschel was Senior Wrangler and Peacock was Second Wrangler in 1813.

Another source says Babbage did take the exam and was third.

Babbage was grumpy

Babbage thought the teaching was awful and founded the Analytical Society with Herschel and Peacock while still undergrads.

Was Lucasian professor from 1828 to 1839 but never lectured.

Was grumpy with Government later!

Babbage and Brunel

Babbage was consultant to Brunel when building GWR. Had rights to a company train.

One Sunday morning in 1838 he arrived at Paddington and demanded his train. The line just went to Maidenhead.

He was told to use either track since no one else was about.

Just about to set off when Brunel arrives unexpectedly on his train.

What if?

If they had been on same track and engines had collided and both killed then maybe

No mathematical engine.

End of working with Ada Lovelace.

No language called Ada.

We wouldn't be here today.

This potential disaster made them think about signalling. Even today railways are one of only two industries who seem to care about correctness. Other is avionics.

Why a language called Ada?

Two threads from mid-1970s concern the many languages for embedded systems such as process control.

In Europe

Coral 66, RTL/2 , LTR, PEARL ...

EU decided that a new language for all of Europe would be a good thing. (An example of ever closer union?)

Established LTPL-E which had many meetings mostly in Brussels.

But experts advised Europe to join US in a global effort.

The High Order Language project

US also had too many languages such as

Jovial (Jules Own Version of Integer Algol)

CMS

Tacpol

Established HOL project under leadership of Col William Whittaker. The management team included Phillip Wetherall of RSRE at Malvern.

First task was to decide what it was all for.

Requirements

What a good idea to write some requirements!

Strawman, Woodenman, Tinman, Ironman, Steelman

3. Types

3A. Strong Typing. The language shall be strongly typed. The type of each variable, array and record component, expression, function, and parameter shall be determinable during translation.

3B. Type Conversions. The language shall distinguish the concepts of type (specifying data elements with common properties, including operations), subtype (i.e., a subset of the elements of a type, that is characterized by further constraints), and representations (i.e., implementation characteristics). There shall be no implicit conversions between types. Explicit conversion operations shall be automatically defined between types that are characterized by the same logical properties.

Let four contracts

Colour-coded to enable unbiased comparisons!

Green Honeywell, actually in Versailles, Jean Ichbiah

Red Intermetrics, Boston, Ben Brosgol

Blue Softech, Boston, John Goodenough

Yellow ?? ??



The eliminations

After one year, Blue and Yellow were eliminated.

Blue was strange but interesting.

Yellow was incompetent – failed to meet requirements.

After another year, Red was eliminated (it had changed direction somewhat) whereas Green had consolidated its position.

Green acclaimed in 1978.

But what to call it?

The project had gone to plan except that they had not chosen a name.

Eventually in a bar in Paris they decided upon Ada because

- * wanted to name it after a worthy person (like Blaise Pascal)

- * wanted to honour a woman (Grace Hopper had done much for COBOL)

- * Ada was clearly the world's first programmer.

Permission was sought

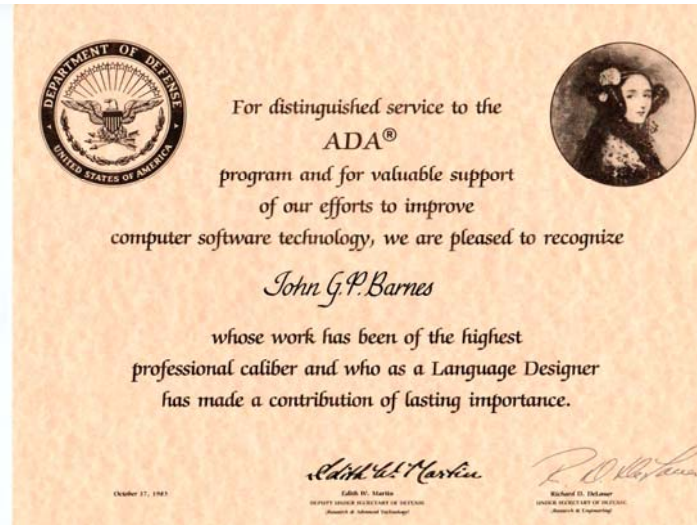
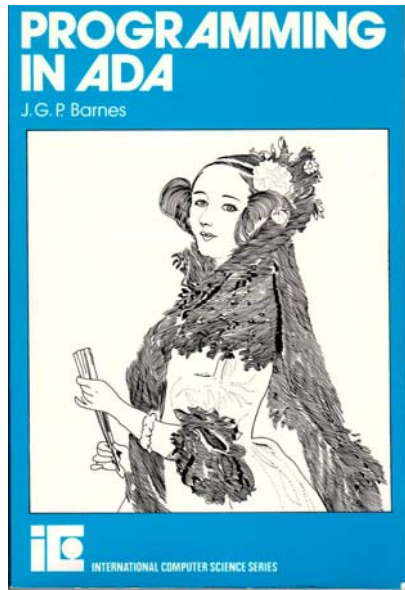
Phillip Wetherall from RSRE wrote to the then Earl of Lytton. (10 October 1978)

The Earl replied on 18th and said Yes and noted that

ADA was at the heart of RADAR

The language community were delighted to have Ada as their Mascot.

Ada appeared everywhere



Conferences

An especially good one in London in 1997.

Guest speaker was the Earl of Lytton who is here today. It was his father that gave permission to use the name.

With entertainment from the New York Village Opera group.

A play called the Maiden and the Mandate. Showed conflict between Lady Ada who wrote excellent software in Ada and the treacherous Hacker who wrote in C.

It was based on Trial by Jury.

Lady Ada



Lady Ada played by Karen Mason (née Leah).

Ada and Freedom

We crave freedom.

But freedom takes two forms.

Freedom from problems on one hand and freedom to do whatever you want on the other. These freedoms conflict.

Ada aims to provide freedom from problems by detecting difficulties early in the development of software.

Ada applications

Mainly used for software that matters in avionics and railways. Much is confidential. But I can mention:

iFacts – Air traffic Control system now in use over London area. See demo at Bletchley.

Written in Ada and Spark.

Spark is a proof tool. Origins of Spark are work done at RSRE in 1970s by Bob Phillips and sponsored by a requirements board chaired by Dame Steve Shirley.

Ada now

Ada 2012 incorporates contracts and Spark 2014 is now integrated into the Ada toolset.

The goal is to show that a program is correct through contracts and formal proof.

Testing can only show the presence of bugs and not their absence.

Ask AdaCore for details.

Beware automotive and medical software!

A sad note

One day in Paris a member of the HOL team said he would take me to the winebar on the Champs Elysees where the name Ada was chosen and we would celebrate with champagne.

But –

it was now a Burger King!

Biblio

Mr Hopkin's Men (2007) by Alex Craik, Springer

ISBN 978-1-84628-790-9

Describes maths at Cambridge in early 19th century. Hopkins crammed men to be wranglers. Includes much about Babbage and Wright.

Alma Mater or seven years at the University of Cambridge, by a Trinity Man {anon = John M F Wright} (1827) 2 vols, Black, Young & Young

The End