The Horror of Learning:
Reflections on Object Orientation and Language Wars

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The only appropriate response to self-deprecation is agreement

- David Ungar
A Banquet Speech

Should be:
Entertaining
Easy to follow
Relevant
Deep
## Banquet Speeches vs. Technical Talks

<table>
<thead>
<tr>
<th>Speech should be:</th>
<th>Talk is very often:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entertaining</td>
<td>Dull</td>
</tr>
<tr>
<td>Easy to follow</td>
<td>Hard to understand</td>
</tr>
<tr>
<td>Deep</td>
<td>Shallow</td>
</tr>
<tr>
<td>Relevant</td>
<td>Irrelevant</td>
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</tbody>
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Reflection

- Usually, talks are about something other than themselves (base level)
- Some talks are about themselves (meta-level)
- Reflection is very important in the OO world - and the world is OO!
Computers are Reflective

The stored-program computer keeps its program in memory.
Therefore, a program can operate on itself.
The von Neumann machine is thus inherently reflective.
Computers are Object-Oriented

- The stored-program computer keeps its program in memory together with its data.
- The von Neumann machine is thus inherently object-oriented.
What is Object Oriented Computing?

Computing where everything, including the computation itself, is represented as an object.
Is Object-Oriented computing successful?

- If so, why?
- If not, why not?

Same questions for Java
It depends what “is” means

- Bill Gates
What do you mean by “successful”?

- Fullfilling a function (engineering)
- Self propagation (organisms, markets)
Metarules are what matter

- How memes spread
- Reaching a tipping point
- Ultimately, it’s game theory
Why would you want more than a machine language?

- John von Neumann
So is Java Successful?

- Yes
- Why?
- Netscape!
Surely something about Java helped it spread

- Similarity to other widely known memes
- In our case C, C++
- Similarity need not be deep
Syntax was Familiar

- Syntax is how most people perceive programming languages
- Most discussions on language devolve into discussions of meaningless syntactic details
Parkinson’s Law of Triviality

... the time spent on any item of the agenda will be in inverse proportion to the sum involved.
Semantics were quite different

Better methods of fast and fearless prototyping and development are needed. The Java language environment is one of those better ways, because it’s interpreted and dynamic.

- The Java Language Environment: A White Paper
James Gosling and Henry McGilton
Semantics were quite different

Programmers using “traditional” software development tools have become resigned to the artificial edit-compile-link-load-throw-the-application-off-the-cliff-let-it-crash-and-start-all-over-again style of current development practice.

- The Java Language Environment : A White Paper
James Gosling and Henry McGilton
One of the goals of JAVA is to enable the construction of software that can run stand-alone in small machines. The size of the basic interpreter and class support is about 30 Kbytes, adding the basic standard libraries and thread support (essentially a self-contained microkernel) brings it up to about 120K.

- The Java Language Environment : A White Paper
  James Gosling and Henry McGilton
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Once we recognize a pattern, we have difficulty distinguishing it from similar but distinct patterns.
Put another way

... there is nothing more difficult to execute, nor more dubious of success, nor more dangerous to administer than to introduce a new order of things
The Horror of Learning

It is practically impossible to teach good programming to students that have had a prior exposure to BASIC: as potential programmers they are mentally mutilated beyond hope of regeneration.

*Edsger Dijkstra, EWD498*
The Horror of Learning

The use of COBOL cripples the mind; its teaching should, therefore, be regarded as a criminal offense.

*Edsger Dijkstra, EWD498*
The Horror of Learning

If the truths are sufficiently impalatable, our audience is psychically incapable of accepting them and we will be written off as totally unrealistic, hopelessly idealistic, dangerously revolutionary, foolishly gullible or what have you.

*Edsger Dijkstra, EWD498*
A Good Place to Experience the Horror

Selected Writings on Computing: A Personal Perspective

Edsger W. Dijkstra
Study Meta-rules

- Study Programming in light of:
  - Cognitive science
  - Game theory
  - Evolution
Popular != Good

- Technical Merit has little to do with Adoption
- Will not ensure widespread adoption
- Widely adopted technologies are not exemplars of technical merit
To Minimize Damage

- Teach many languages, many paradigms
- Teach principles, not details
- Research ideas, not manifestations
Conclusion

You want to look at your reflection in a mirror and be comfortable with what you see.