



3 Myths and 3 Challenges

To Bring System Administration Out of the Dark Ages

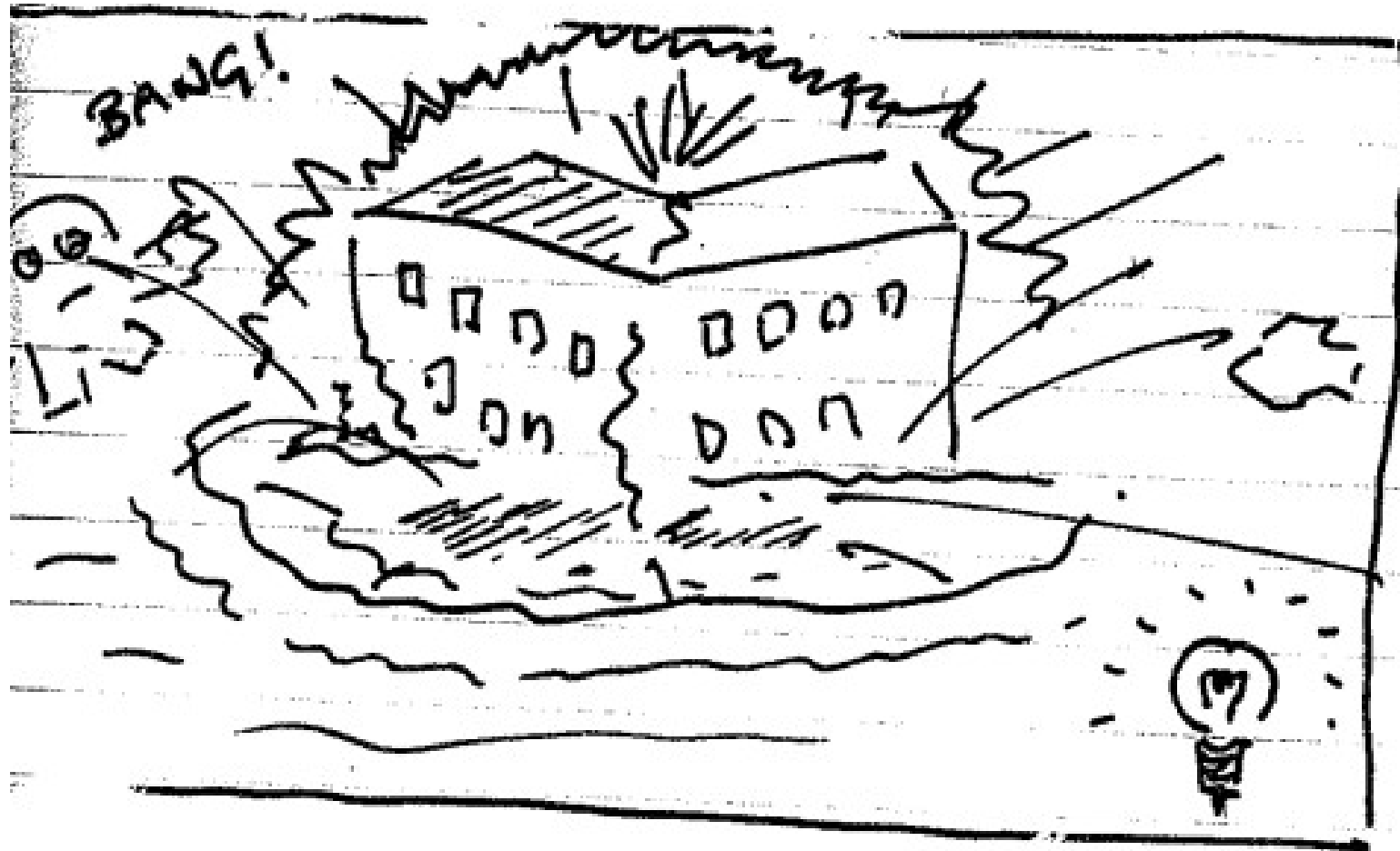
Mark Burgess



From Dark Ages passed ...



To enlightenment ... ?



To an industrial present ...



The 3 Waves of Technology



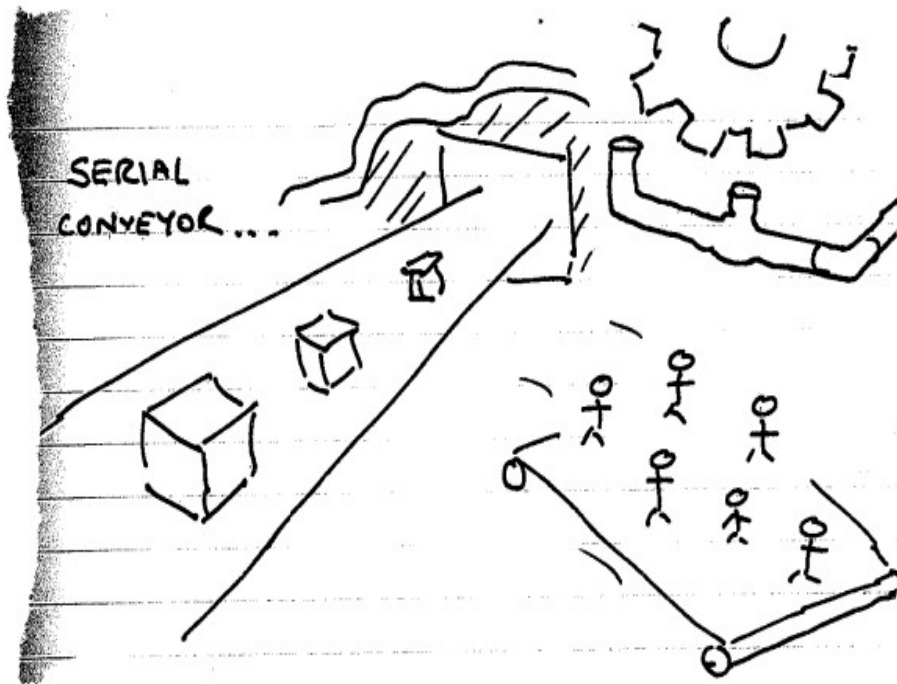
1W. Agriculture Wave - Tend it by hand

2W. Industrial Wave - Amplify Man with Machine

3W. Knowledge Wave - Learn and Design with Intent

2W Myth 1: ordered sequential control

or why British people like to queue up



- The flow-chart / script era
- Parallelization is the key to scale and search
- Stability is convergence
 - Going in circles?
 - Limit cycle or fixed point

The Chomsky hierarchy



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- Complex grammars ARE order dependent
- Sometimes the ordering is artificial – just 2nd wave thinking
- Many cases can be approximated without that complexity if we have an alternative model – that reduces fragility
- Fragility = design error (bad engineering)

2W Myth 2: determinism & rollback

Or why you shouldn't walk in front of trains



- We don't control all details about environment
 - Critical sections
 - Single user mode
 - Thread locks
 - Transaction control
- Deal with the outcome not the mistake
- Clinging on to certainty





Reducing risk without time-travel

- **Rockets**
 - Planning
 - Overhead
 - One chance only
 - Major roll-out
- **747**
 - Easy to make
 - Reusable
 - Adapt



2W Myth 3: hierarchy or bust or why trees are losing to human beings



- A tree is just a spanning set for a more general set of relationships
- Trees cut parts off from one another
- Lock it down .. marginalize
- Depth-vs-breadth problem
- Trees are fragile
- Trees often imply rank or authority, according to old-world conventions

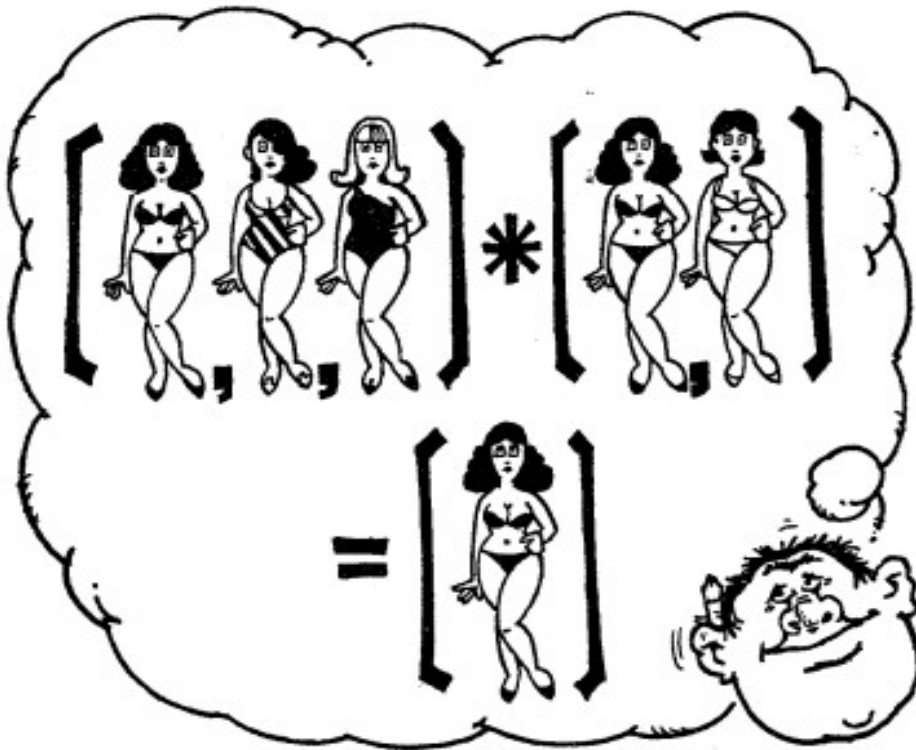


Lie back and think about sets ...

Sets

All you think about is sets.

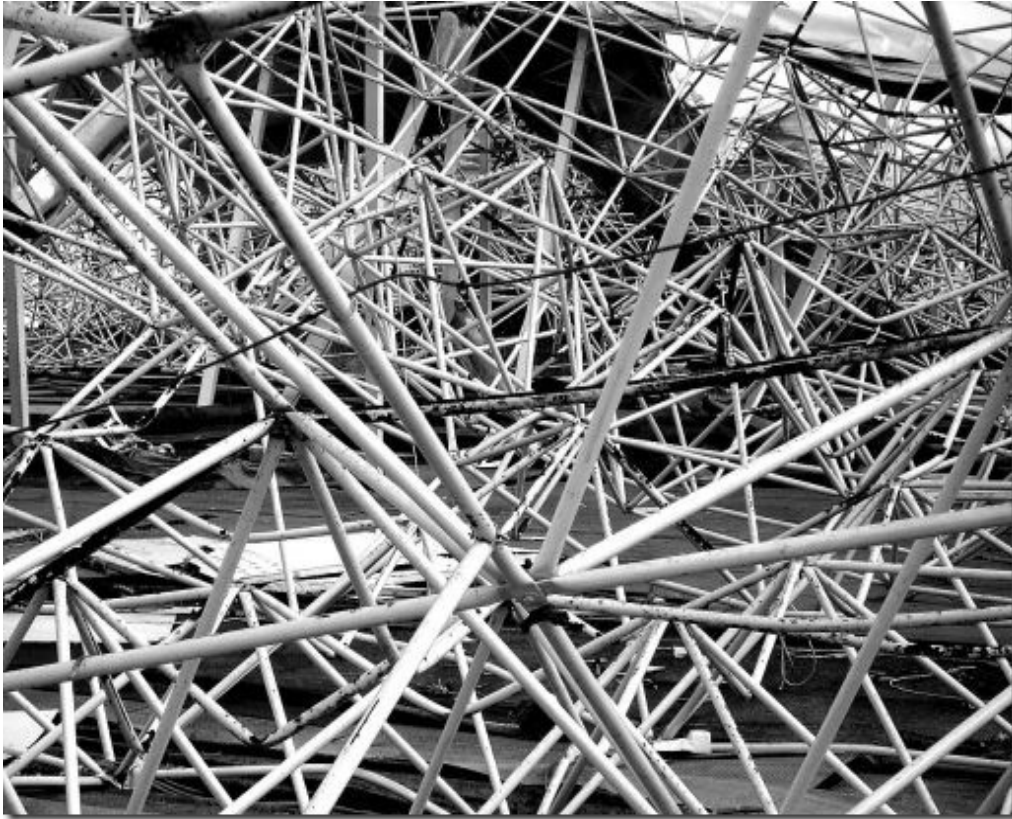
CONDEMNATION OF ADOLESCENT PASCAL PROGRAMMER



- A more general approach
- Tag labels are like sets that can overlap
- CFEngine class model
- Great flexibility and robustness
 - As complexity increases, mutual exclusion fails as an organizing principle

3W challenge 1: emergent complexity

or why you shouldn't have to tidy your room



- Empiricism – see what happens before locking everything down
- Why are we afraid of complexity?
- One size does not fit all:
 - e.g. Everyone should speak Norwegian
 - “Any colour as long as it's black”
- Complexity allows us to escape the growth spiral by diversifying

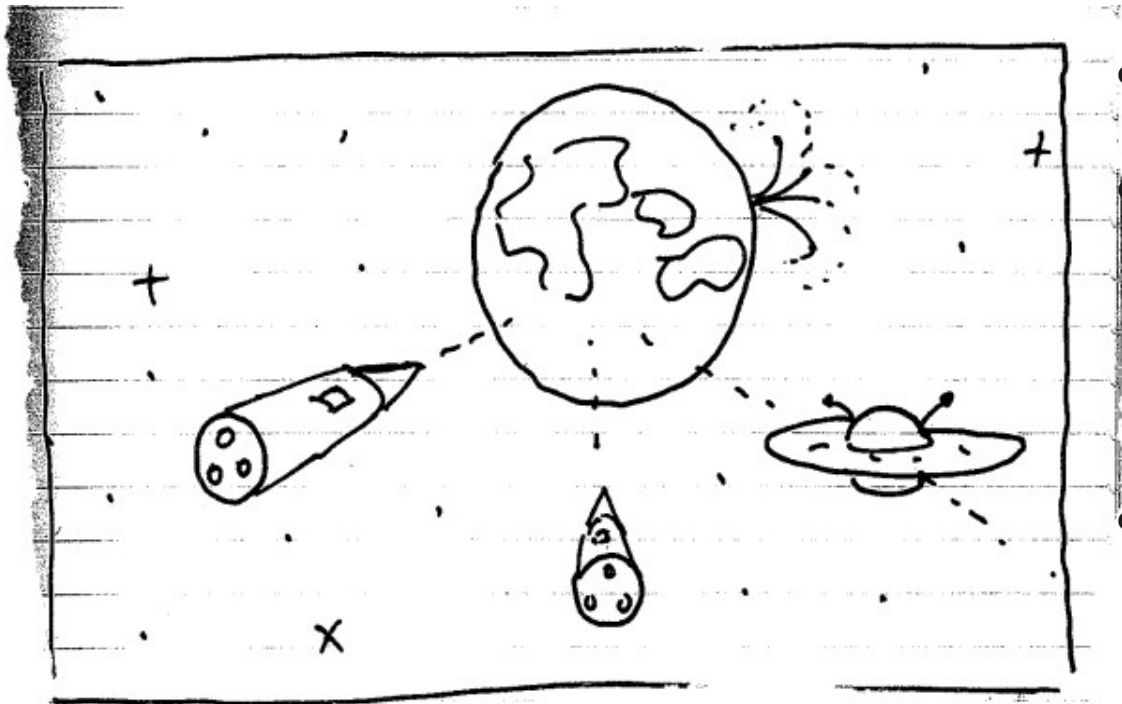
Today's IT is not a Swiss Watch..



...more like a muddy ecosystem

2W challenge 2: commerce alignment

or why rockets have trajectories
but fireworks just blow up



- Business drives the world
- Technology has a purpose
 - Might be programmed
 - Or opportunistic
- The tools should work for us, not the other way around...

From 2nd to 3rd Wave tools ...





What actually drives society and its progress?



The freedom equation: $F = me^3$

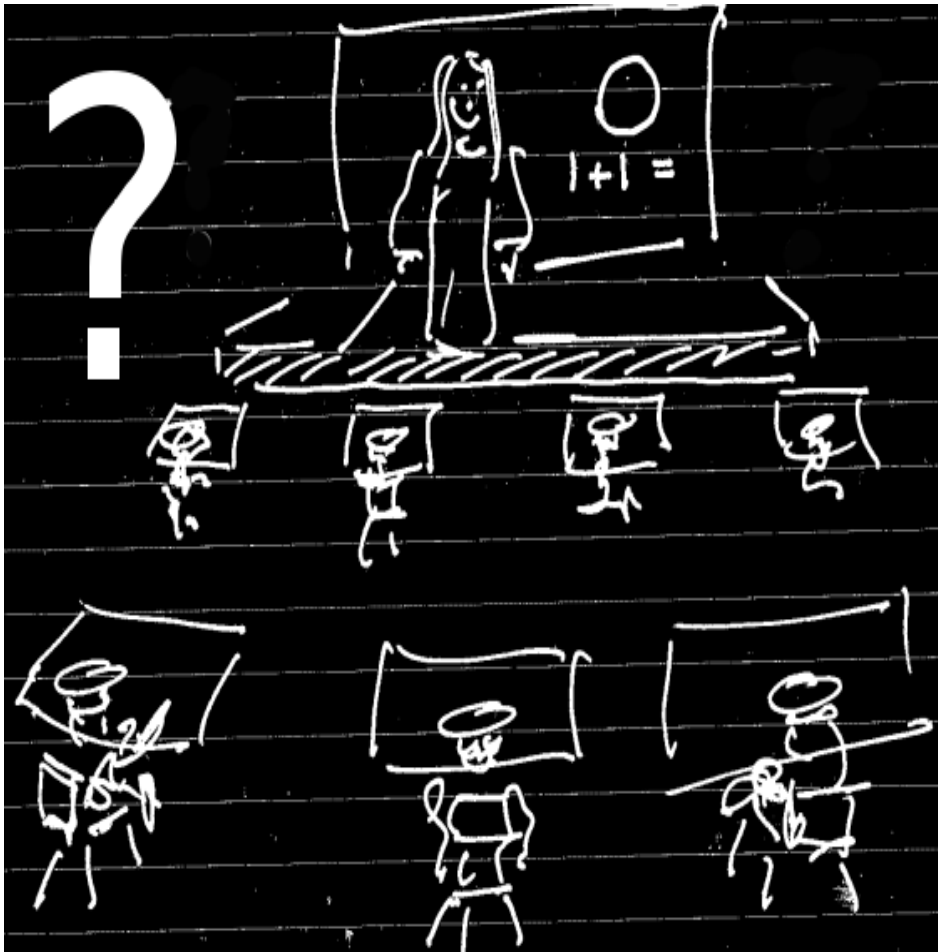


The real cloud



3W challenge 3: knowledge

Or why you should consult the plans
before digging a hole



- Experience is being diluted and harder to come by
- Mentoring doesn't scale or meet QA requirements
- Knowledge is more than information
 - Context
 - Meaning
 - Experience
- Patterns compress information and add meaning

Who needs knowledge?



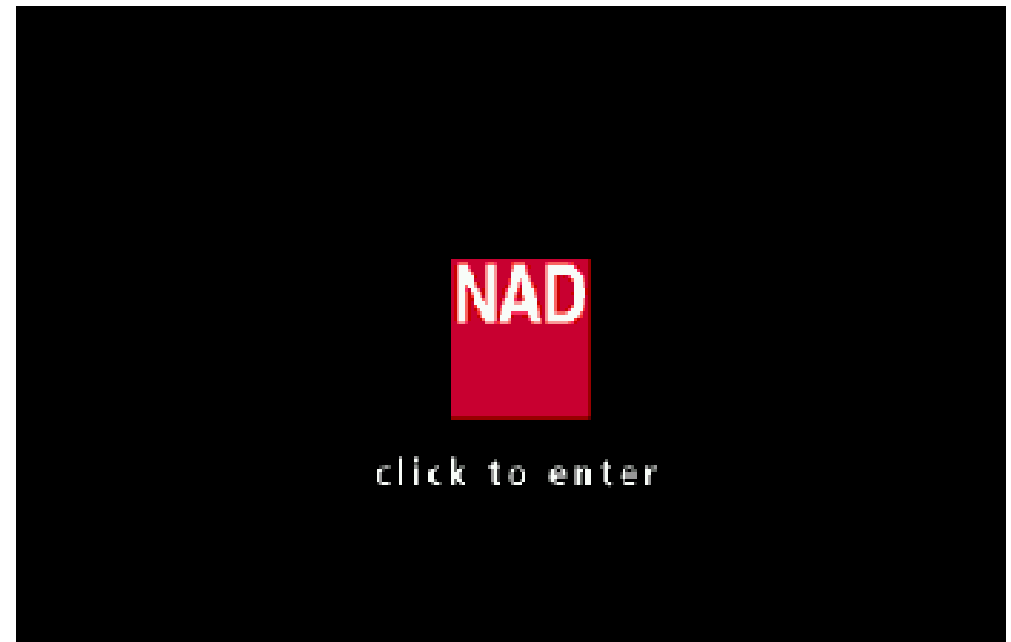
- Everyone who didn't build it with their bare hands
 - What, when, where, how, why?



Meaning vs Information



The screenshot shows the homepage of sol.no. At the top, there's a search bar and a navigation menu. The main headline is "John" in large red letters, accompanied by a photo of a man. Below the headline, there are several news snippets with titles like "Med & drikke", "Med & drikke", "Med & drikke", etc. There are also advertisements for "Leilighet i Marbella?" and "VG". The page layout is typical of a news website from that era, with a mix of text, images, and ads.

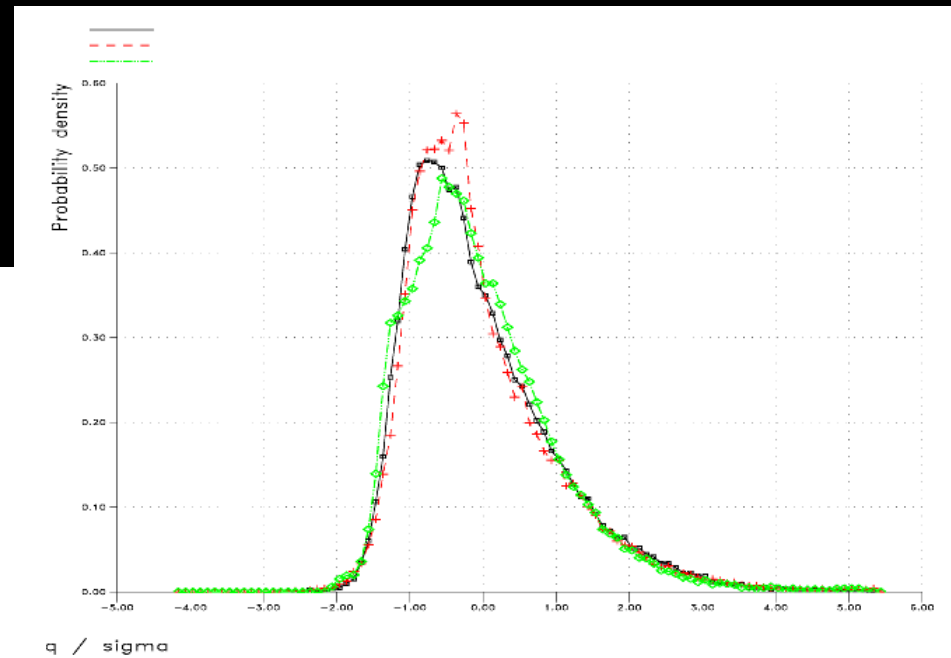


Patterns bring meaning to *cognition*

Significance...



NAD



From Answers to Questions



How do we help sysadmins
(infrastructure engineers)
ask the right questions?

Context Boundary Conditions

Associative inference WHY?



The End?

- What are we waiting for? No time to stand still!
 - The 3rd Wave is amongst us!
- Myths that bind us to the past
 - Serial thinking, determinism, hierarchy
- Challenges that invite the future
 - Emergence, goal orientation, knowledge
- Next:
 - Change the face of system administration
 - → Infrastructure engineering



Thank you

and enjoy the rest of the conference

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Sets picture `From BASIC to Pascal'

Historical picture of New York
underground from WWW

Various commodity pictures