Preface

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Application Holy Wars theme and why the book was written

William P. Hall

President
Kororoit Institute Proponents and Supporters Assoc., Inc. - http://kororoit.org

william-hall@bigpond.com
http://www.orgs-evolution-knowledge.net

Access my research papers supporting the book from
Google Citations

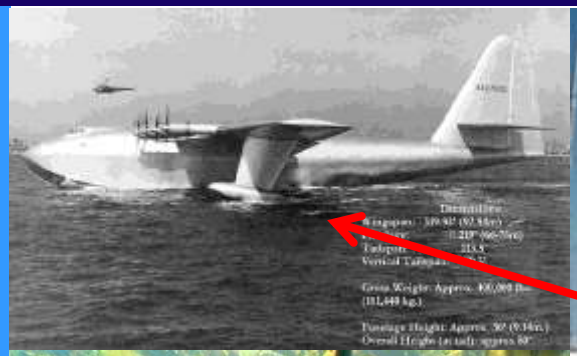
Overview

- Threads from my history and professional career
  - Growing up on a boat amongst the diversity of marine life
  - Engineering, physics & biophysics
  - Zoology, trophic ecology, genetics & evolutionary biology
  - History & philosophy of science: epistemology & revolutions
  - Generations of computer technology
  - Documentation, computer literacy & technical communication
  - State of the art engineering content & knowledge mgmt
- Questions arising: Bank of Melb. & Tenix Defence
  - Roles of computers & documentation in corporate success
  - Incommensurable paradigms as barriers to understanding
    - Computerization and application holy wars
    - What is knowledge
    - What is life

Early influences

- Father trained as a geologist & worked as an industrial engineer in defence aerospace industry
- Mother trained as a chemist
- As a child I had easy access to their old textbooks
- Family lived on a boat in Southern California & we spent many weekends & holidays at Catalina Island
- Spent much of my time watching life in the water
- A photographer neighbour gave me a couple of good microscope objective lenses
- Learned more from high school science club than classes excepting high school biology
- Aspired to build spaceships and go to the stars!

Marine diversity & aerospace engineering



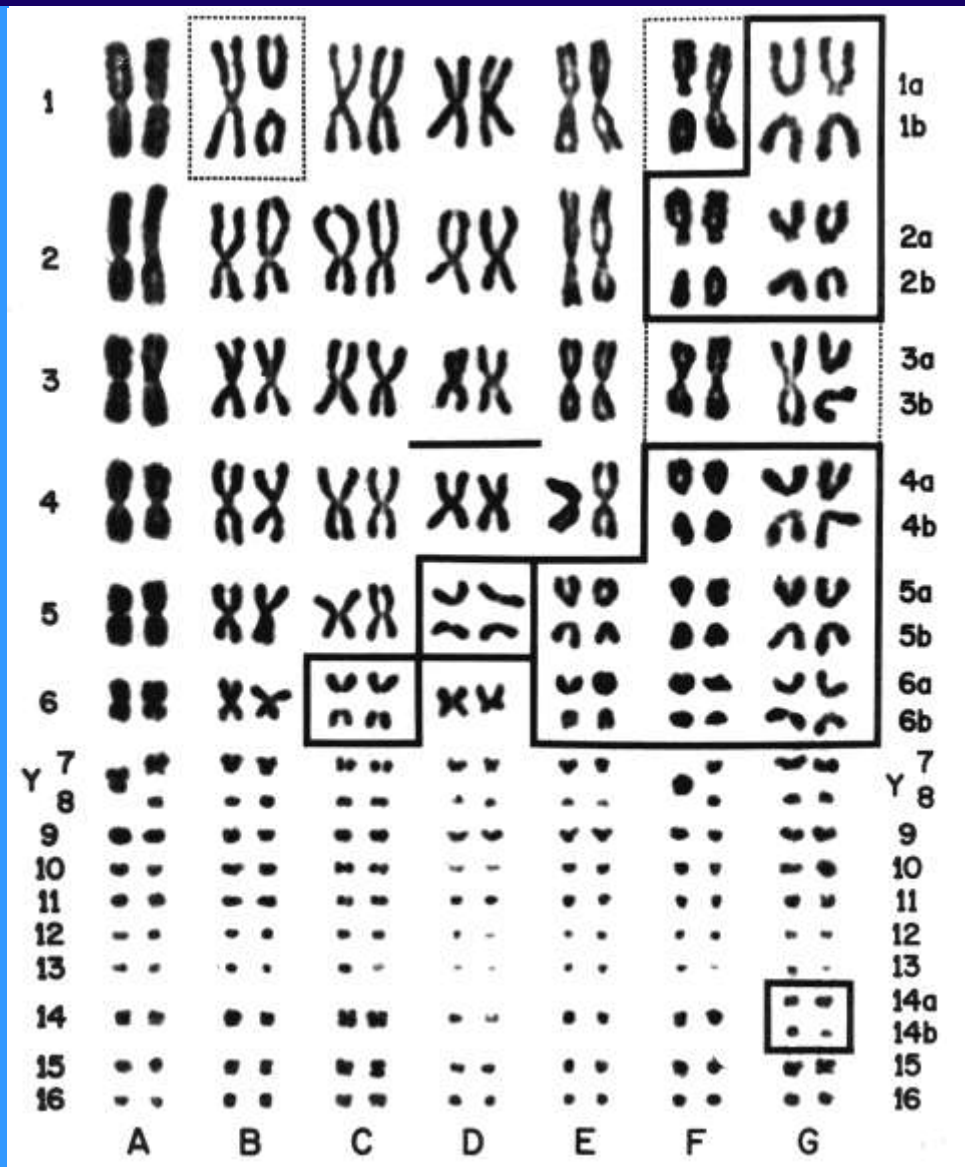
University physics then zoology

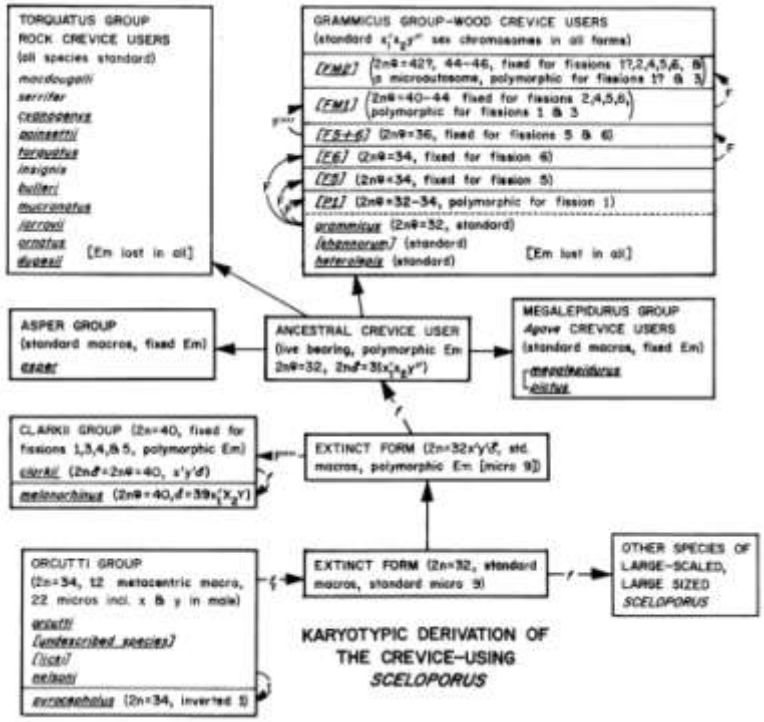
- 1957 – UCLA physics for 2½ yrs – but dyslexic
  - Changed to zoology but still flunked out after 4 yrs
    - Extracurricular computer studies in calculus course
    - Thermodynamics / zoology / natural history / animal behaviour
    - Worked 2+ yrs in neurophysiology research lab
- Eventually graduated with BS in zoology (1964)
  - Trophic ecology / marine biology / herpetology / genetics
  - 15 months as ecology research technician on the nuclear test site in Nevada exploring chromosome variation in lizards
- 2 years' masters work at new university
  - Lecturer: general biology / invertebrate zoology
  - Assistant: comparative anatomy
  - Continued studies of chromosome variation in lizards
  - Washington University courses in genetics/evolution
  - Hall, W.P. [1966]. Is the Plastid an Endosymbiont

PhD Evolutionary Biology (Harvard 1967-73)

- Only PhD acceptance – no limits to research!
- Hall, W.P. 1973. Comparative population cytogenetics, speciation and evolution of the iguanid lizard genus *Sceloporus*. PhD Thesis, Harvard University
  - Instructors Steve Gould, J.D. Watson (Nobel Laureate)
  - Advisers: Ernest Williams, Ernst Mayr
  - 3 summers fieldwork through Mexico, SW US, West Indies
- Teaching
  - Teaching fellow
    - George Wald (Nobel Laureate) – general studies life science
    - Irven DeVore (anthropologist) – primate behaviour and evolution
  - Harvard Extension
    - Invertebrate biology
    - Vertebrate biology

7 chromosomal races in the *Sceloporus grammicus* complex in Mexico





My professional career as an evolutionary biologist

- University of Puerto Rico, San Juan (3 yrs)
  - Biogeography (3 terms), cytogenetics (2 terms), genetics, invertebrate biology, marine biology, comparative vertebrate anatomy, vertebrate ecology, and postgraduate seminars in cytogenetics and systematics
- University of Colorado, Boulder (15 months)
  - Reorganized general education biology (1,000 students)
  - Taught classical & molecular genetics (summer sessions)
  - Postgraduate seminar on genetic systems, evolution & speciation
- Univ. Melbourne Research Fellow in Genetics (2 yrs)
  - Supposedly writing up PhD research & looking for comparable variation in Australian lizards
  - Mostly studied epistemology & history/philosophy of science
  - Contributed to genetical evolution plants & animals subject
- Univ. Maryland College Park (1 yr half time)
  - Evolutionary biology, vertebrate zoology, experimental genetics

My paradigmatic crises in biology

- I invented the endosymbiosis theory for the origin of eukaryotic cells before Lynn Margulis published the now established version
  - Explaining the origin of complex cellular organelles in the first lecture of my invertebrate zoology course
  - I wasn't able to publish because I had no degree or "qualifications" in cell biology (lacking in "authority")
- My PhD thesis presented a new theory of species formation (see Hall 2010 for review)
  - Alternative mode to Ernst Mayr's geographic speciation
  - My method of argument was also aberrant
    - No one liked my writing or could tell me why they didn't like it
    - Difficulties with journal editors
    - Darwinian "comparative" vs "hypothetico-deductive"
    - Neither I nor my advisers consciously understood the epistemological foundations of science
  - Hence my study of epistemology and HPS (Hall 1983)

Migration to Australia (late 1980) and a new career

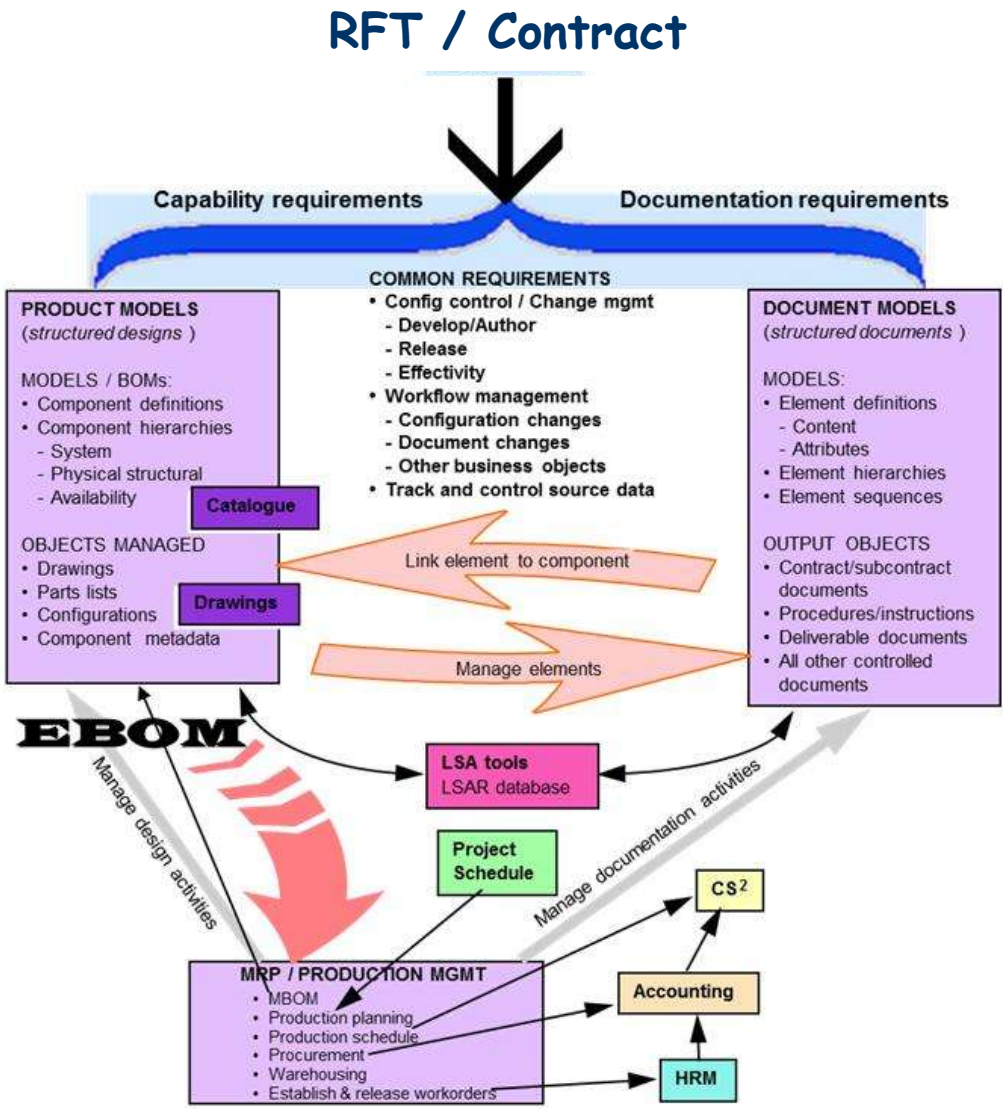
- Lousy job prospects in USA / better connections here
- Sugden fellowship Queens College (residential)
  - Library & other goods lost for 9 months in Singapore
  - Discovered prototype (personal) microcomputer
  - Started an academic word processing bureau to pay for it
- Bogart's Restaurant Computer Club ferment
  - Queens not interested in what personal computing revolution meant for students' futures
  - Computer training & editor for computer literacy journals
  - Technical author and document manager for Computerease
- Technical author & documentation mgr Bank of Melb.
  - Merger of two building societies – only one computerized
  - Explained to executives how the computer system worked
  - Ended up managing all computer & corporate services doco
  - Fired after reorganization by a jumped up book keeper

Tenix Defence & ANZAC Ship Project (1990-2007)

- $ 7 BN ANZAC Ship Project designed & built 10 high-tech frigates for Australia (8) and NZ (2)
- Began in Commercial as WP systems expert & designer
  - Flow down T&Cs from prime contract to subcontracts
  - Implemented computerized document indexing system
  - Staff computer literacy training
- Support Engineering (~ 1993 – 2001)
  - Determined contract requirements for support documentation & test, evaluation, and validation requirements to demonstrate ship operational availability
  - Designed & helped implement Operational Availability Recording and Reporting System
  - Implemented Structured Information Management for doco
- Head Office (2002-June 2007)
  - Various knowledge management systems analysis roles

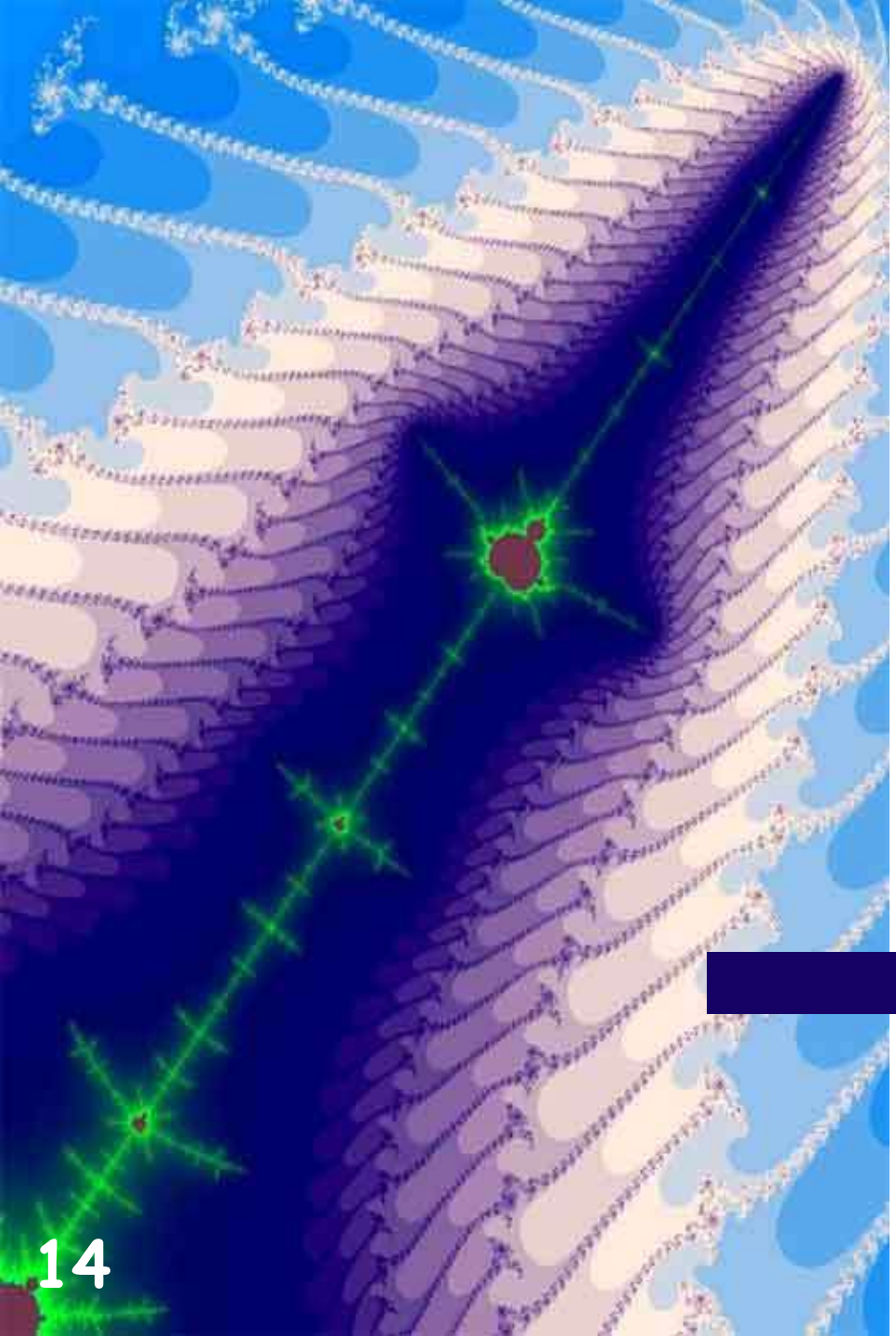
Tech data/documentation solution saved $100s of millions

- Product and textual data are *structured* and are managed as content (SGML/XML)
- Production mgmt data is *transactional* and is managed as records and fields
- **Goal is to manage all project data within a single configuration management umbrella**



As the ANZAC Ship Project was successfully finished Tenix failed because it forgot how to build ships

- Within 6 months of starting a 3 yr project to build 6 patrol vessels and a roll-on, roll-off transport for New Zealand the project was years over schedule and way over budget
- After completing one of the most successful naval shipbuilding projects in history, Tenix no longer knew how to build even simple naval ships
- To recover some capital on their investment, Tenix's owners auctioned their defence assets just as the company won the contract to build 2 Spanish designed helicopter landing ships (troop and equipment carrying aircraft carriers)



Questions arising

Management failures to understand the roles of computing revolutions in their organizations

- Tenix wasted 10s of millions on failed IT projects – some so badly implemented that vendors were told to go away and take their systems with them
- To cope with changes they must be understood
- Corporate managers have failed to grasp the strategic importance of technologies implemented within their organizations
- Computerized knowledge versus ponderous paper
  - CALS (acronym from military support engineering community
    - Computer Aided Logistic Support
    - Commerce At Light Speed
  - Knowledge is power
    - Right knowledge to the right people when/where needed

Incommensurable paradigms and holy wars

- Thomas Kuhn on scientific (and technical) revolutions and paradigmatic incommensurability
- Computerization & application holy wars
  - Ponderous paper versus commerce at light speed
  - Electronic typewriters vs structured authoring
  - Why do these issues start holy wars?
- What is knowledge?
  - Tacit vs explicit
  - Data/Information/Knowledge/Intelligence/Wisdom/Power
- What is life?
  - My first serious question as a biology student
  - I only fully answered it when I realized that organizations like Tenix were also living entities in their own rights
- I started the book to answer these questions