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# Quality: A Brief History

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# What is Quality Control?

- ISO – International Organization for Standardization
- **Quality Control (QC)** – “...focused on fulfilling requirements.”<sup>1</sup> Ex. Inspections & Testing of Products

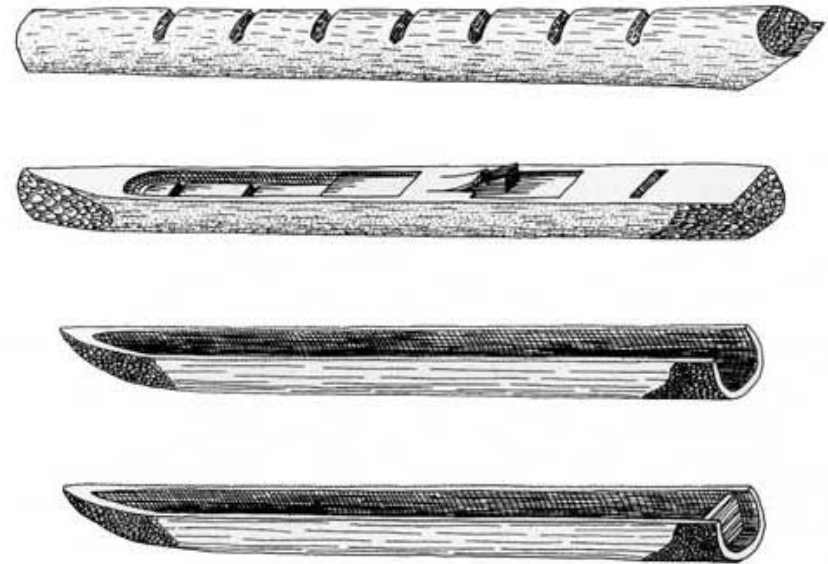


# How old is quality control?

- It is hard to say...  
Quality control is everywhere and in our nature.
- Natural Selection - If you believe in this, it is a great example of quality control.

# Historical Examples of Quality Control

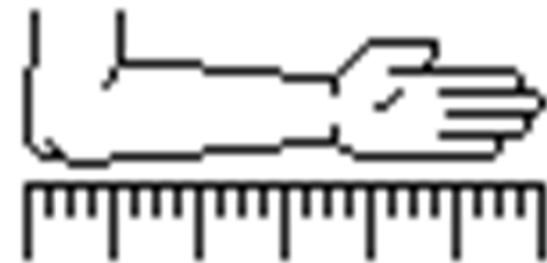
- Flints used to carve alder or limewood Dugout Canoes (~3500 B.C. in Denmark)<sup>2</sup>



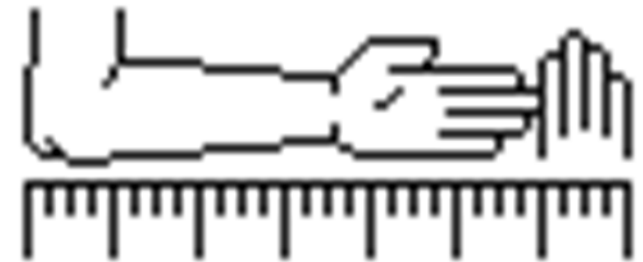
The excavation of a mine revealed a **discarded parts** pile.

# Historical Examples of Quality Control, continued

- Cubit – First measurement of length.
- The Royal Egyptian Cubit was to be calibrated against a precision standard (Royal Cubit Master) at regular intervals. “Failure to do so was punishable by death.”<sup>3</sup>



Common cubit



Royal cubit

# Components of Quality Management

- **Quality Control** –
- **Quality Assurance (QA)** – “...focused on providing confidence that quality requirements will be fulfilled.”<sup>1</sup>

Code of Hammurabi (3000 B.C. in Babylonia)

“The mason who builds a house which falls down and kills the inmate shall be put to death.”<sup>4</sup>

# Components of Quality Management cont.

- **Quality Planning** – “...focused on setting quality objectives and specifying necessary operational processes and related resources to achieve the quality objectives.”<sup>1</sup>
- **Quality Improvement** – “...focused on increasing the ability to fulfill quality requirements.”<sup>1</sup> Kaizen, Six Sigma, Lean Manufacturing, etc.
- 3500BC → 21<sup>st</sup> Century
- Quality Control → Quality Management

# Quality Related Historical Events

## Life Changing Events

- **1775-1783** American Revolution
- **1914-1918** World War I
- **1939-1945** World War II
- **1945** 1<sup>st</sup> Atomic Bomb (Trial and Warfare)
- **1954** 1<sup>st</sup> Commercial Nuclear Power
- **1979** Three Mile Island
- **1986** Chernobyl
- **2011** Fukushima Daiichi

## Measurements and Standards

- **1781-1789** Articles of the Confederation
- **1783** US Customary Units (after revolution)
- **1789** United States Constitution
- **1790** Jefferson Report
- **1800** Office of Standard Weights and Measures
- **1901** National Bureau of Standards
- **1960** International System / Metric (SI Units)
- **1988** NIST

## Quality

- **1930s** Statistical QC (SQC – Control Charts)
- **1947** ISO Founded
- **1950s** Total Quality Control
- **1968** Japanese (Companywide QC)
- **1970s** ISO 9000 NISO Founded
- **1987** ISO QM Standard
- **1994** ISO 9001:1994
- **2000** ISO 9001:2000
- **2008** ISO 9001:2008
- **2015** ISO 9001:2015

## Eichrom Technologies

- **1976** NPO Founded
- **1981** NPO NIOSH Certified
- **1990** Eichrom Founded
- **1995** Eichrom ISO Certified
- **2008** NPO Acquired by NIOSH
- **2015** NPO ISO Certified

**20th Anniversary!**



# Document, document, document

- Is it really worth doing if you don't write it down?
- How to manage all of the data?
  - 20<sup>th</sup> Century – Manufacturing Industry / Quality Advancements
  - 21<sup>st</sup> Century – Electronic Industry

# Quality Management Software

- **Quality Collaboration by Design (QCBD -- Access database)**
  - **Customer Comment**
  - Corrective and Preventive Action
  - Equipment Management
  - Master List and Change Management
  - Nonconformance Control
  - Process Deviation
  - Vendor Management
  - Training Management

# Why?

- Eichrom's commitment to the radiochemistry community to provide analytical separation products that the world can count on.
  - “Do it right the first time”
  - “Do it today, not tomorrow”

Mike Fern, President of Eichrom



[www.eichrom.com](http://www.eichrom.com)

# Works Cited

- <sup>1</sup> Hoyle, David. *ISO 9000 Quality Systems Handbook*. 4<sup>th</sup> ed. Great Britain: Butterworth-Heinemann, 2001. Print.
- <sup>2</sup> Juran, Joseph M. *A History of Managing for Quality: The Evolution, Trends, and Future Directions of Managing for Quality*. USA: ASQC Quality Press, 1995. Print.
- <sup>3</sup> Nemeroff, Edward. *A Standards, Metrology, Conformity Assessment and The TBT Agreement: A Desk Top Reference Handbook*.  
[http://pdf.usaid.gov/pdf\\_docs/Pnadp635.pdf](http://pdf.usaid.gov/pdf_docs/Pnadp635.pdf)
- <sup>4</sup> Omachonu, Vincent K. and Joel E. Ross. *Principles of Total Quality*. 3<sup>rd</sup> ed. USA: CRC Press, 2004. Print.