Markup of and for Mathematics

Ten years of trials
Ten years of troubles
Ten years of trying

Patrick D. F. Ion

Mathematical Reviews / American Mathematical Society

Co-chair W3C Math Working Group 1998–2003

Early ideas of the computer age

- TEX: D. E. Knuth's creation
- I'm only here for the math!

Earlier Scenarios of Change

- Printing
- Machine Screw Standards
- Venn Diagrams
- World Wide Web

Printing

- 1450–1550: Creation
- 1550–1800: Consolidation
- 1800–now: Modern technology

Steinberg, S. H. (Sigfrid Henry),1899–1969.

Five hundred years of printing ; with a foreword by Beatrice Warde.

3d ed. Harmondsworth, Eng. ; Baltimore : Penguin Books, 1974. x, 262 p.

Machine Screw Standards

- screws
- *Turn of the Century*
  in WIRED Issue 10.01 | Jan 2002, The History Issue
  `http://www.wired.com/wired/archive/10.01/standards.htm`
- Wiliam Sellers:
  `http://www.famousamericans.net/williamsellers/`
- ASME Codes and Standards Chronology:
  `http://www.asme.org/history/cs_chron.html`

Scranton, Philip.

Endless novelty : specialty production and American industrialization, 1865-1925.

Princeton, N.J. : Princeton University Press, c1997. xiv, 415 p.

Telegraphy

- ca. 1800–1900

Standage, Tom.

The Victorian Internet : the remarkable story of the telegraph and the nineteenth century's on-line pioneers.

New York : Walker and Co., c1998. ix, 227 p.

Venn diagram

- ca. 1880

Edwards, A. W. F.(Anthony William Fairbank),1935–.

Cogwheels of the mind : the story of Venn diagrams.

Baltimore, Md. : Johns Hopkins University Press, 2004. xvi, 110 p. ; 25 cm.

World Wide Web

-
- Tim Berners-Lee (Sir Timothy)

Problem Scenarios

- XML Mathematics markup could be marginalized
- Copyright and IP issues could stifle innovation
- Mathematics really is the melancholy science

Problem Scenarios - 1 of 3

- XML Mathematics markup is marginalized
  - STEP
  - CATIA and Micrografix

Problem Scenarios - 2 of 3

- Copyright and IP issues stifle innovation

Problem Scenarios - 3 of 3

- Mathematics really is the melancholy science
  - Heinrich von Gent (1240-1293), Dürer print, Saturn

Special Issues for Mathematics

- XML Special characters
- HTML plus <math> vs. XML
- Unicode and Fonts
  - STIX

Pre-History: before 1993

- Pasigraphy
  - The study of universal languages of symbols intended to encapsulate semantics and to provide the basis for calculational ratiocinatio.
  - Leibniz, Georg Wilhelm (1646-1716)
  - Schroeder, Ernst (1841-1902)
  - Peano, Giuseppe (1858–1932)

Leibniz, Georg Wilhelm

- Freiherr von Leibniz (1646-1716)
- Biography page

  `http://www-gap.dcs.st-and.ac.uk/ history/Mathematicians/Leibniz.html`
- `calculus ratiocinator`
- Meditationes de Cognitione, Veritate et Ideis
  (Reflections on Knowledge, Truth, and Ideas) 168?
- Calculating machine

  `http://www-gap.dcs.st-and.ac.uk/~history/Bookpages/Leibniz_machine2.j`

Schroeder, Ernst (1841-1902)

- Biography page

  `http://www-gap.dcs.st-and.ac.uk/ñistory/Mathematicians/Schroder.html`

- Lehrbuch der Arithmetik und Algebra für Lehrer un Studirende, 1. bd. Die sieben algebraischen Operationen. Leipzig, B. G. Teubner, 1873. x p., 1 l., 360 24 cm.
- Zürich ICM 1897

Peano, Giuseppe (1858–1932)

- Formulaire des Mathématiques, t. I-V, Turin, Bocca frères, Ch. Clausen, 1894-1908.
- Intro. Notations de logique mathématique par G. Peano. 1894. 52 p.
- t. I. Formulaire de mathématiques publié par la "Rivista di matmatica" tome I. I. Logique mathématique. II. Opérations algébriques. III. Arithmétique. IV. Théorie des grandeurs (Burali-Forti). V. Classes de nombres (Peano). VI. Théorie des ensembles (Vivanti). VII. Limites (Bettazzi). VIII. Séries (Giudice). IX. Contribution à la théorie des nombres algébriques (Fano). 1895. vii, 144 p.
- t. II–no. 1. Logique mathématique par G. Peano. 11-VIII-1897. 63 p.
- t. II–no. 2. Arithmétique par G. Peano. 9-VIII-1898. viii, 59, [1] p.
- t. II–no. 3. Logique mathématique–Arithmétique–Limites–Nombres complexes–Vecteurs–Dérivées–Intégrales. Turin, Bocca frères [etc.] 1899. 198, [1] p.
- t. III. Formulaire de mathématiques publié par G. Peano. 1901. viii, 230, [1] p.
- t. IV. Formulaire mathématique publié par G. Peano. 1903. xvi, 406 p., 1 L.
- t. V. Formulario mathematico edito per G. Peano. 1908. xxxvi, 463 p.

Peano, Giuseppe (1858–1932)

- Biography page

  `http://www-gap.dcs.st-and.ac.uk/ history/Mathematicians/Peano.html`

- Page with the Peano axioms for the natural numbers

  `http://www-gap.dcs.st-and.ac.uk/ history/Bookpages/Peano10.gif`

1987

- Workshop on Environments for Computational Mathematics,July 30, 1987
  ACM SIGGRAPH Conference, Anaheim Convention Center, Anaheim, California
- Arnon, Denis. RFC 1019. Network Working Group. Report on above. Sept. 1987

  `http://www.networksorcery.com/enp/rfc/rfc1019.txt`

Ten Years for MathML

1993

- OpenMath

1994

- Grainger Digital Library Meeting, Champaign, July †
  - ISO12083 hacked
  - Roy Pike
  - Robert Miner
- WWW IV, Darmstadt, October †
  - Mathematics Panel: Dave Raggett, Phil Hallam-Baker
- Future of Mathematical Communication, MSRI Berkeley, December †
  - Oak (i.e. Java)
  - MUD
  - Ginsparg
- Dave Raggett's HTML Plus with mathematics

1995

- W3C Math Editorial Review Board †
  - Dave Raggett, Ron Whitney (AMS) Chair, Robert Miner, Patrick Ion
- Constable report
  - NUPRL and its promise

1996

1997

- W3C Math WG chartered, May 1997 - 2000
  - IBM, Hewlett-Packard, Adobe, Elsevier Science
  - Wolfram Research, Maplesoft, Softquad
  - Geometry Center, American Mathematical Society

1998

1999

2000

- MathML Users' Group Meeting 1, Champaign IL, June
- Math WG charter expires, December

2001

- MathML 2.0 Recommendation, 21 February
- MathML WG Rechartered, May 2001 – May 2003
- note slide 2001a.htm has charter bits
- <a href="file:///Users/patrickion/Documents/archive/toshd/Mat

2002

- MathML Users' Group Meeting 2, Chicago IL, June

2003

- W3C Math Working Group finishes, May
  - Charter accomplished
  - Notes on Units; Web Services

2004

- W3C Math Interest Group chartered
  - Chair: Robert Miner & David Carlisle
- Searching of Mathematics, IMA, Minneapolis, April
- OpenMath TN Workshop, Helsinki, May

2005

1994