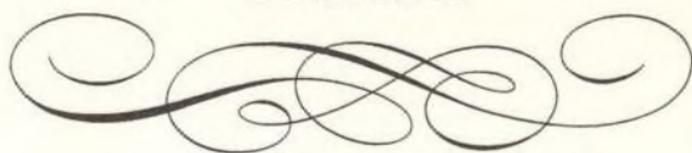
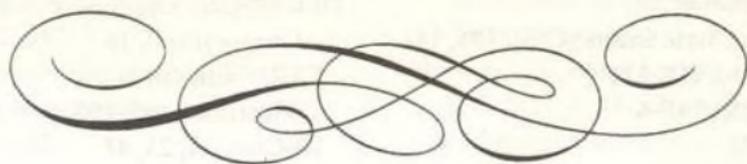


Contents



	<i>Acknowledgements</i>	vii
	<i>Foreword by Michael Dertouzos</i>	ix
1	Enquire Within upon Everything	1
2	Tangles, Links and Webs	8
3	info.cern.ch	27
4	Protocols: Simple Rules for Global Systems	38
5	Going Global	57
6	Browsing	73
7	Changes	81
8	Consortium	97
9	Competition and Consensus	111
10	Web of People	133
11	Privacy	155
12	Mind to Mind	169
13	Machines and the Web	191
14	Weaving the Web	216
	<i>Appendix to the Paperback</i>	229
	<i>Glossary</i>	253
	<i>Index</i>	261

Index



- Abramatic, Jean-François, 109, 118
Addis, Louise, 50–3, 69
Addressing scheme, 22. *See also* URL (URI)
Aldeman, Leonard, 162
America Online (AOL), 98, 113–14, 117, 121, 135, 144
Andreessen, Marc, 74–7, 83, 89, 90, 99, 103, 107, 126, 178
Apple computer: Hypercard, 22
Macintosh browsers designed, 73, 78, 83, 106
Applets, 61, 111, 197
'As We May Think' (Bush) 5
Baird-Smith, Anselm, 131
Bangemann, Martin, 96, 102
Barksdale, Jim, 111, 114
Barran, Paul, 7
Berners-Lee, Tim:
browser for WWW created, 32
CERN 1980, 4, 9–12
CERN 1984–89, 13, 15–26
CERN 1990–92, 33–4, 46, 49–50
CERN proposal (birth of Web), 23–4
children born, 32–3
code for WWW written, 30–1
director of W3C, 101,
See also World Wide Web Consortium
earliest ideas for WWW, 1, 3–7, 25
education, 4
Enquire, 1, 4, 10–12, 17–18, 19, 22
evangelising for the Web, 33, 46, 48, 55, 59
feelings about commercial opportunities and WWW, 89–92, 117–18
first employment, 4
hypertext protocols, 151–2
Internet enters life, 21, 23
at MIT's LCS 78, 95–6, 97–109
NeXT PC, 25–6, 30, 32, 50, 53, 60
parents, 3–4
sabbatical, 1992, 65–72
Tangle, 14–15
television interview, 124–5
Unitarian Universalism and, 225–7
vision for WWW, 1–2, 30, 33, 36, 82, 90–1 94, 98, 133, 169–89, 217–27
WWW consortium, 81–2, 84 88–96, 97–104
WorldWideWeb program released to CERN people, 49, 181
WorldWideWeb program released on Internet, 49–50
Better Business Bureau Online, 160
Bina, Eric, 74, 76–7, 78
Bosak, Jon, 129
Bray, Tim, 129
Brown, Peter, 28
Browser. *See* Web browser
Bruce, Tom, 75–6, 82, 83
Bush, Vannevar, 5, 6
C language, 35 versus objective-C, 53
Cailliau, Robert, 27–8, 32, 33, 34, 36, 46, 47, 48, 55–6, 60, 62, 63, 80, 90, 92, 96, 103, 109, 169, 212
first international WWW conference, 85–6, 63, 90–3, 134

- Macintosh browser, 60
 president of WWW Conference
 Committee, 98
- Cascading Style Sheets (CSS), 181, 182
- Case, Steve, 114, 121
- Censorship, 145-6
 bias, 135
 filters, 136, 145, 146
 versus self-regulation, 123-4, 134.
See also PICS; Filtering software
- Cerf, Vint, 7
- CERN, 4, 4n, 8-10, 15, 21
 Berners-Lee at, 4, 9-12, 13, 15-26,
 32-3, 47-8, 49-50, 51, 65, 89
 computers and competing software
 used at, 9-10, 16, 17, 28, 34, 47
 Discussion sub-directory, 187-8
 hosts international WWW
 conference, 85-6 92-6
 info.cern.ch (server), 31, 33, 48, 50,
 54, 59, 72, 81, 102
 Internet and, 20-1
 intranet, 62
 Large Hadron Collider, 108
 Large Electron Positron accelerator,
 16
 Norsk Data SYNTAN-III operating
 system at, 12
 public domain status of WWW, 80
 telephone book, 35
 WWW's birth at, 35-6
 WWW Consortium and, 96, 104,
 105
 WWW within, 49-50, 59
- Clark, Dave, 58
- Clark, Jim, 89, 90, 99, 107, 111
- COMDEX, 1994, 99
- Communications Decency Act, 123
- Compaq, 13, 16, 111, 142
- CompuServe, 98, 113, 144, 145, 179
- Connolly, Dan, 119, 120, 129
- Content, separation of form from,
 140-2, 182-3
- Cyber Patrol, 147
- Databases, 195, 199-201
- Davis, Donald, 7
- DEC (Digital Equipment
 Corporation), 16
 CERN visit, 84
 Consortium and, 100
 DECnet, 21, 23, 47
 intranet, 62
- Decentralisation, 18, 39, 106, 201, 220
- Dertouzos, Michael, 78, 82, 88-9, 97,
 110
- D. G. Nash Ltd., 4
- Documentation systems, 17-18, 22
- Domain name system, 137-40
 security of, 162
- Dougherty, Dale, 69, 82-3, 102-3,
 118, 129
- Dynatext, 29
- Ego surfing, 192
- Electronic Book Technology, 29
- Electronic commerce (e-commerce), 2,
 104, 149-52
 endorsements, 150-2, 161
 IBM e-business mark, 149-50
 standards for, 149
- Electronic Data Interchange (EDI),
 204
- Electronic mail (e-mail): before
 WWW, 21
 confidentiality and authenticity
 issues, 165
- Engelbart, Doug, 6, 55
- Enquire Within upon Everything, 1, 2
- Enterprise Integration Technology
 (EIT), 89
- European Conference on Hypermedia
 Technology (ECHT 1990), 28
- European Conference on Hypermedia
 Technology (ECHT 1994), 102-3
- European Union, 96
- Webcore, 85
- Fermilab, 75
- Filtering software, 135, 145, 146

- Fink, Steve, 84
- Fluckiger, François, 96
- Form, separation of content from, 140–2, 182–3
- Free Software Foundation, 80
- FTP (file transfer protocol), 33, 42, 43, 64, 82
- Gates, Bill, 98–9, 116, 117, 121
- Gateways, 55
- General Public License (GPL), 80
- GIF (Graphic Interchange Format), 179
- Gifford, David, 78
- Global Internet Liberty Campaign (GILC), 148
- Gopher, 44, 74, 79
- Gosling, James, 111
- Grant, Gail, 84
- Graphics formats, 178–9, 180
- Grif, 49, 109, 130
- Groff, Jean-François, 53, 54
- Gross, Phil, 90
- Hagino, Tatsuya, 125
- Hardin, Joseph, 76, 77, 86
- Marman, Amy, 148
- Helsinki University of Technology, 60
- Heuristics, 210
- Hewlett-Packard (HP), 73–4, 100
- Hoesl, van, Frans, 64
- Hypertext: alt.hypertext, WorldWideWeb program released on, 49–50
- Berners-Lee and, 17–18, 19, 25, 27–8
- commercial editors, 28, 49
- Engelbart and, 6
- free speech and, 151–3
- global, 22, 24
- Nelson and, 5
- '91 conference, 55
- philosophical aspects, 29–30
- virtual museum, 64
- WWW and, 35–6, 197
- Hypertext (1991 conference), 55–6
- See also* European Conference on Hypertext Technology; European Conference on Hypermedia Technology
- Hypertext Markup Language (HTML), 2, 31, 39, 44, 46–6
- development of, 93
- fragmentation concerns, 104, 172–4
- metadata in, 195–6
- reason for, 44–5
- rivals of, 45–6, 102
- standardisation of, 57
- tags, 45–6
- Hypertext Transfer Protocol (HTTP), 2, 39, 42–3, 103
- code written for, 30–1
- format negotiation, 44
- HTTP 1.1, 103
- https, 163
- standardisation of, 57
- IBM, 100, 121
- e-business mark, 149–50
- Image Computer Systems, 13
- Incompatibility between computers and Web, 36–7
- Java and, 111
- infodesign.ch, 54
- Information Services Institute, 44
- INRIA (Institut National de Recherche en Informatique et en Automatique):
- Grif at, 49, 109, 130
- W3C European base, 109
- International Computers Ltd, 78
- International Standards Organization (ISO), 19, 129
- Internet, 7, 19–20
- access, changes needed in, 170–1
- in America, 1980s, 19
- based information system, 44, 175
- Berners-Lee and, 21
- decentralised sociotechnical architecture, 220
- European alternative, 1980s, 19

- hypertext and, 25–6, 28, 49
 protocols and, 20, 21, 39, 44
 security issues, 86, 104
 service providers (ISPs), 87, 117, 142
 use analysed, 221
WorldWideWeb program released
 on, 49–50
- Internet Assigned Numbers Authority
 (IANA), 137, 138
- Internet Engineering Task Force
 (IETF), 57–8, 65–8, 78, 80, 90, 98,
 101
 meeting, 1992, 66–8
- Intranet, 62, 175
- Java, 61, 111–12, 121, 131, 196–7, 207
- Jobs, Steve, 25
- Johnson, Tony, 69, 70
- JPEG (Joint Photographic Experts
 Group), 179
- Junk on the Web, 145–6.
See also Filtering software
- Kahle, Brewster, 43, 55
- Kahn, Bob, 7
- Kahn, Gilles, 109
- Keio University, Japan, 125
- Khudairi, Sally, 117, 119
- Kleinberg, Jon, 222
- Klensin, John, 68
- Knuth, Donald, 197
- Kotok, Alan, 84, 118
- Kroll, Ed, 82
- Kunz, Paul, 50, 69
- Legal Information Institute, Cornell,
 75
- Legal liability and the Web, 143–4
- Lie, Håkon, 126, 181
- Literary Machines* (Nelson), 5, 71
- Links: analogy to brain, 40–1, 222–3
 embedded, 151–2
 in Enquire, 12, 17–18
 external, 12–13, 18, 35–6
 free speech and, 151–3
- hot buttons, 22
 idea for, 3–4, 5, 14
 information system and, 23
 internal, 12, 35
 intuition and, 219
 myths about, 152–3
 normal, 151
 paper, traditional, 41
 program for, 21–2
- Location independence, 171–2
- Long, Dave, 87
- Ludvigsen, Børre, 93
- Luotonen, Ari, 63, 103, 187–8
- MARC record, 204
- Massinter, Larry, 58–9
- Mbeki, Thabo, 110
- McCahill, Mark, 44
- Merit Inc., 86
- Metadata, 195–6
- Metakides, George, 96
- Microsoft, 987–9
 antitrust suit, 126–7, 134, 141
 Internet Explorer, 117, 126
 Netscape and, 99, 107
 Windows, 106
 Windows 95 and bundled Internet
 access, 99, 116
 Windows 98, 126–7
- Minimal constraint, principle of, 42,
 133–4
- MIT (Massachusetts Institute of
 Technology), Laboratory for
 Computer Science (LCS), 58, 59,
 65–6, 68, 78, 82, 88, 95, 110, 137
 Berners-Lee at, 94–6
 Consortium formed at, 88–96,
 97–110
 web.mit.edu, 66
 web server for W3C (w3.org), 102
- Moffat, John, 224
- Montulli, Lou, 74, 83, 89
- Mosaic, 75–8, 82, 89, 130
See also Netscape
- Mouse, 6

- MUDDs, 186
- National Center for Supercomputing Applications (NCSA), University of Illinois, 74, 75, 76–7, 78, 81, 82, 83, 84, 86, 89, 99, 107
- Navisoft Inc., 87, 113
- Navipress, 87, 113
- Nelson, Ted, 5, 6, 22, 70–2
- Net Perceptions, 156
- Netcheck Commerce Bureau, 149
- Netscape, 89–90, 99, 100
 - free release of, 89–90
 - IPO and stock, 114–15
 - Microsoft and, 99, 111
 - Mozilla (Navigator 1.0), 103, 104, 106, 107
 - Navigator 2.0, 121
 - open source policy, 128
 - security issues and Secure Sockets Layer (SSL), 104, 163
- Network Solutions, 138
- Newcastle University, 78
- Newman, Clifford, 44
- NeXT Inc., 25–6
 - computer, WorldWideWeb code written on, 25–6, 30, 33, 49, 51, 53, 60, 62
 - failure of despite product, 30
- Nielsen, Henrik Frystyk, 63, 103, 185
- NLS (on line System), 6
- NNTP, 42, 43
- Online Privacy Alliance, 161
- Online research, 192–3
- Online voting, 186
- Open source software, 185
 - community, 164
- Operating systems, 21
 - communication between different, 19, 21
- O'Reilly Associates 69, 82, 83, 87, 102
- Owl Ltd, 28, 29, 102
- Patents, 213–15
- Patrick, John, 121
- PCs (IBM and clones), 49, 83
- Pellow, Nicola, 32, 47, 53, 63
- Pesce, Mark, 94
- PGP (Pretty Good Privacy), 165–6
- PICS (Platform for Internet Content Selection), 123, 125, 135, 147, 148, 150, 196, 209
- PKC (public key cryptography), 136, 162, 163–4
 - government fear of loss of control and, 163–4
 - RSA, 162
- PKI (Public Key Infrastructure), 165
- Plessey Telecommunications, 4
- PNG (Portable Network Graphics), 179
- Pollerman, Bernd, 35
- Poole, John, 12–13
- Pordes, Ruth, 76
- Pornography on the Web, 121–3, 146
 - liability, 145
- Portals, 134, 143
- Postel, Jon, 137
- Privacy issues, 135–6, 155–68
 - click stream information, 156
 - confidentiality, 163
 - cookies, 157
 - European regulations, 158
 - hypertext protocols and, 152
 - P3P (Platform for Privacy Preferences Project), 152
 - PKC (public key cryptography), 136, 162, 163–6
 - software for, 159
 - Web site privacy policy, 159
- Prodigy, 98, 113
- Prospero*, 44
- Protocols, 20, 21, 38, 133–4
 - Document Object Model (DOM), 182
 - elements for the Web, list, 39
 - global systems, 38
 - graphics formats, 178–9, 180
 - independence, 172, 181
 - Internet, 39, 44
 - standardization of WWW's, 57–8,

- 80, 105
 universality needed, 176–8.
See also Hypertext Transfer Protocol (HTTP); URL (URI)
- P3P (Platform for Privacy Preferences Project), 159, 161
- Putz, Steve, 64, 83
- Quint, Vincent, 109
- Raggett, Dave, 73–4, 94, 105, 126
- Reed, Brian, 84
- Reno, Janet, 127
- Reynolds, Joyce, 58, 66
- Rimm, Marty, 122
- Rimmer, Peggie, 15
- Ritchie, Ian, 28, 102
- Rivest, Ron, 162
- Rogers, Kevin, 9, 10, 12
- RPC (remote procedure call) project
 at CERN, 16, 18, 19, 22
 addressing scheme, 25
- Saito, Nobuo, 125
- Scheifler, Bob, 85, 88
- Screen scraping, 192
- Search engines, 191–2, 194
- Secret, Arthur, 59
- Secure MIME, 165
- Security issues: digital signature, 163
 Secure Sockets Layer (SSL), 104, 163.
See also Electronic commerce
- Segal, Ben, 19, 26, 32, 53
- Semantic web, 169–70, 191, 193, 195,
 197, 199–211, 222
 interference languages, 200, 203
 knowledge representation, 201
- Sendall, Mike, 19, 25, 28, 50, 96
- Separation of form from content,
 140–2
- Shamir, Adi, 162
- SMIL (Synchronized Multimedia
 Integration Language) 180, 183
- Social machines, 186
- Sociotechnical issues, 119–26, 135–54
- See also* Censorship
 Pornography
 Privacy
 Protocols
- Sollins, Karen, 58–9
- Somm, Felix, 145
- Stallman, Richard, 80
- Standard generalized markup language
 (SGML), 45–6, 48–50, 103, 129
- Stanford Linear Accelerator (SLAC),
 50, 69, 70
 first web server outside of CERN, 51
- Stock market and WWW, 114–15, 134,
 223
- Sun Microsystems, 111
- Tangle (program), 14–15
- TCP/IP, 20, 21, 22, 23, 58, 87
- Telnet server, 52
- T_eX, 197
- Thinking Machines, 43
- Thompson, Dave, 74
- Totic, Alex, 83
- Trust. *See* Web of Trust
- Trust engine, 208–9
- Unisys, 179
- University of California, Berkley, 60,
 69
- University of Kansas, 74
- University of Minnesota, 44
 gopher, 44, 74, 91
 licensing fee controversy, 79–80
- University of Texas, San Antonio,
 Hypertext conference, demo of
 WWW, 1991, 56
- Unix, 19, 21, 26, 34, 49, 61, 69 83, 106
- URL (URI), 2, 36, 39–40, 42–5
 code written for, 32
 as fundamental innovation for the
 Web, 42
 naming of, 67, 137–8
 prefixes, 44
 standardisation of, 57, 66–8
- US Defense Advanced Research

- Projects Agency, 102
- Van Dam, Andy, 29
- Varney, Christine, 160
- Vatton, Irene, 109
- VAX/VMS 16, 21, 55
- Veza, Albert, 88–9, 94–5, 97, 100, 101, 118
- Viola, 60–1, 62, 68, 69, 73, 89
- Virtual Library, 59
- VRML (Virtual Reality Markup Language), 94, 180
- Web browsers:
- Amaya, 109, 130, 185
 - Arena, 73–4, 105, 109
 - development of first, line-mode, 33, 53
 - as editor, 35, 50, 61, 75–6, 87, 109, 120, 181–5
 - Erwise, 60, 62, 73
 - gopher, 44, 74, 79, 91
 - licensing fee controversy, 79–80, 81–2
 - Lynx (screen-mode), 74
 - Midas, 70, 73
 - Samba, 63, 73
 - search for, 28–9, 35–6
 - Viola WWW, 61, 62, 68–9, 73
- Windows,
- Cello for, 75–6, 83
 - See also* Microsoft Netscape
- Web of Trust, 165–8, 209
- Web pages or sites:
- first, 31
 - privacy policies, 158–60
- Web servers (HTTP):
- Apache, 131, 212
 - early classics, 64–5
 - first one, info.cern.ch, 31, 33, 48, 50, 54, 59, 72, 81, 102
 - first outside of CERN, 51
 - Jigsaw, 131, 184–5, 212; 1992, spread of, 59, 64, 72; 1993, continued development of and Mosaic, 73–8, 85; 1994, Netscape started, 89
 - Telnet, 52
 - virtual museum, 64
- Webcore, 85
- Websoft, 90
- Wei, Pei, 60–1, 69, 70, 74, 83, 212
- What Will Be* (Dertouzos), 110
- Whole Earth Internet Catalog* (Kroll), 82
- Wide Area Internet Servers (WAIS), 44, 55
- Williams, David, 25, 65
- Wilson, Chris, 83
- Windows:
- Cello for, 75–80
 - Mosaic for, 82–3
 - See also* Microsoft Netscape
- Wollongong University, Australia, 21, 22
- World Wide Web (WWW):
- body (consortium) to oversee formed, 81–2, 84, 88–96, *see also* World Wide Web Consortium
 - browser created, 1990, 33
 - client, 30,
 - code written for, 31–1
 - as collaborative medium, 63, 133–4, 169, 172–3, 183–6, 218, 223
 - commercialism and, 115
 - companies, releasing beta versions and giveaway software, 107–8
 - control of, concerns, 134
 - damping mechanism needed, 222
 - early steps in project, 29–30,
 - fundamental principle, 40
 - future of, 205, 210, *see also* Semantic Web
 - gateways to VAX/VMS and WAIS, 50
 - global brain analogy, 221–2
 - global growth, 62, 81, 87, 117, 218
 - hypertext and, 18, 25
 - incompatibility between computers

- solved, 37, 39–40
- infrastructure, 139–40
- international conference, first (1994), 85–7, 92–6
- international conference (WWW6 1997), 129
- junk on, 145–6,
see also Filtering software
- as killer application, 35
- legal liability and, 143–4
- as management tool, 37
- named, 225
- neutrality of, 140–1
- news group to share information about, 51
- on-line mailing list added (www-talk@info.cern.ch), 55, 59, 185
- open source policy, 185
- principle of minimal constraint, 42, 134
- protocols for, 39
- program released on Internet, 49–50
- public domain status, 79–80
- self-regulation, 123–4, 160
- social impact, 216–27
- software/commercial services start-ups, 90
- spreading of, 1991, 49–50, 51, 53
- telephone-system analogy, 106
- theme: interplay between political decision and technical, 46
- universality of, 174–6
- vision for, 1–2, 14, 29, 33, 35, 82, 90–1, 96, 133, 169–90, 216–27
- World Wide Web Consortium (W3C), 100, 101, 104, 114
- Advisory Committee, 104–6, 118
- agreements about privacy, 159
- Amaya browser, 130, 184–5
- Apache web server, 131, 212
- Asian host, 125
- Document Object Model (DOM), 182
- evolvability, 205
- formed, 81–2, 84, 88–96
- global agreement, 203
- government support for, 102
- intercreativity, 183–6, 219–25
- internationalisation activity, 181
- Jigsaw server, 131, 212
- Live Early Adoption and Demonstration (LEAD), 184
- management positions, 116
- membership, 100, 125–6, 128
- network security issue, 104
- PICS (Platform for Internet Content Selection), 123, 125, 135, 147, 148, 150
- policy and procedures, 116–17, 131
- P3P (Platform for Privacy Preferences Project), 159
- public domain software development, 131
- purpose, 101, 128–9, 203
- Resource Description Framework (RDF), 196, 197–8, 199, 201, 202
- sociotechnical issues, 118–25, 135–54
- vendor-neutral status, 101
- website (www.w3.org), 102, 131, 185
- XML development, 129
- www-talk@info.cern.ch (mailing list), 55, 59, 185
- WWW Wizards Workshop, 82–5, 102
- Xanadu, hypertext project, 6, 70–1
- X Consortium, 85, 88–9
- Xerox PARC, 58, 59, 64, 65, 68, 71, 83
- XHTML, 174
- XML (Extensible Markup Language), 129, 173–4, 179, 184, 195, 199, 204, 209
- XSL, 182
- X Window system, 60, 19, 70, 73, 74, 85, 106
- Yahoo!, 134