NOTES

Introduction

1. *New Shorter Oxford English Dictionary,* 1993, p. 371.
2. We are grateful to Shell Oil Company for its pioneering work on "networked communities."
3. This is our sixth book. Previous books: *Networking* (Doubleday, 1982); *The Networking Book* (Viking Penguin, 1986); *The TeamNet Factor* (Oliver Wight/John Wiley & Sons, 1993); *The Age of the Network* (John Wiley & Sons, 1996); and *Virtual Teams* (John Wiley & Sons, 1997).
4. Over the years, we've worked with Apple, AT&T Universal Card Services, BankBoston, Calvert Group, Digital Equipment Corporation, GE, Hewlett-Packard, Hyatt Hotels, Pfizer, and Shell Oil Company.
5. In 1972, we bought and used a Wang 600 Programmable Calculator to run calculations for our cable viability model. In the mid-1970s, a Wang 2200 powered our fire-prevention education work with the U.S. Department of Commerce, which later helped us manage our original research based on material from 1,600 networks. Even earlier, in 1959, at age 15, Jeff started building digital devices, culminating in a 1961 prize-winning piano-sized computer that programmed a high-school master schedule built of IBM electromagnetic relays, switches, and lights and nicknamed the "Don-omatic."
6. *Cable in Boston,* Whitewood Stamps, Inc., 1974.
7. Jeffrey Stamps, *Holonomy: A Human Systems Theory* (Seaside, CA: Intersystems Publications, 1980).
8. We've been influenced by the work of Ned Hermann (*The Whole Brain Business Book,* McGraw-Hill, 1996), especially through its application

by Manny Elkind of Mindtech, 35 Williams Road, Sharon, MA 02067, 781-784-2315, melkind@ziplink.net.

Chapter 1

1. We found this quote on the Context Institute site, http://www.context.org. We sent e-mail to Jaime Snyder, Fuller's grandson, asking to use the quote and inquiring when and where Bucky said this. Jaime's reply: "It is certainly fine to use quote: but I do not know its source. It certainly sounds like Bucky and the idea is consistent with his thinking but I do not know where it might be from. If you have access to a Synergetics Dictionary (a wonderful out of print four-volume research book) at a library you might be able to determine its source." (E-mail from Snyder, "Subject: quote," January 11, 2000.)
2. From an interview with Jim Lynch, vice president of Sun's Corporate Quality Office, February 9, 2000.
3. Andy Campbell, now senior vice president at Applied Knowledge Group, Inc., first said this to us in a telephone conversation in 1993 while he and we were working on the National Performance Review (see Chapter 8, "People").
4. "As of July 1999, 205 countries or territories had at least one connection to the Internet. Thus only four new countries joined the Internet in the first six months of 1999. This is a diminished Internet spread rate, because there aren't many new countries to join." Source: "State of the Internet," Matrix.Net, Inc., http://www.matrix.net.
5. "10 Employees. No Headquarters. $45 Million Payoff. Why Lycos Bought a Virtual Company," *The New York Times,* February 27, 2000, Business section, p. 4.
6. See the book *www.newbusinessdimensions.com* by Bart Piepers and Marcel Storms (Amsterdam, BIS Publishers: 2000), and their web site, http://www.newbusinessdimensions.com.
7. E-mail from Bart Piepers, "Subject: Good luck with your book," January 28, 2000.
8. Interview with John Whyte, CIO, Ernst & Young International, January 24, 2000.

9. See Nua Internet Surveys at http://www.nua.ie/surveys/how_many_online/index.html.

10. See *Weaving the Web* by Tim Berners-Lee (San Francisco, CA: Harper-SanFrancisco, 199).

11. "Poll: On-line population soars to 56% of US adults," *The Boston Globe*, December 22, 1999.

12. "Wide Web: Survey finds number of sites at 1 billion," *The Boston Globe*, January 23, 2000.

13. "Computer Industry Almanac Says Over 364 Million PCs-in-Use World-wide Year-End," March 23, 1999, http://www.techmall.com/techdocs/TS990323-7.html.

14. "For close to a decade the size of the Internet has doubled every year. In MMQ 601 we noted that. . . . [i]t now appears that this growth rate is slowing somewhat. Careful statistical analysis reveals the beginnings of an 'elbow' over the 1997–1999 period. At that time, growth had reached a factor of 2.1 prior to ebbing to 1.46. Incorporating the July 1999 data puts this factor at 1.5. The growth rate of the Internet is, indeed, slowing." Source: "State of the Internet," Matrix.Net, Inc., http://www.matrix.net.

15. Ibid.

16. This is the subtitle of Ray Grenier and George Metes's book, *Enterprise Networking: Working Together Apart* (Bedford, MA: Digital Press, 1992).

17. GM, Ford, and DaimlerChrysler announced their joint venture on February 25, 2000.

18. See Lycos at http://www.lycos.com/info/.

19. Frances Cairncross, *The Death of Distance: How the Communications Revolution Will Change Our Lives,* Harvard Business School Press, 1997.

20. Interview with Dr. Henry McKinnell, president and chief operating officer, Pfizer Inc., president, Pfizer Pharmaceuticals, January 19, 2000.

21. Interview with Russ Baird, quality training leader, GE's Leadership and Development Facility at Crotonville, New York, January 28, 2000.

22. Ray Grenier and George Metes, *Going Virtual: Moving Your Organization into the 21st Century* (Upper Saddle River, NJ: Prentice Hall, 1995).

23. Sun's first machine shipped with Transmission Control Protocol/Internet Protocol (TCP/IP).

24. Interview with Al Ormiston, vice president and general manager, eSun, February 23, 2000.

25. See http://www.ventro.com.

26. E-mail from Rear Admiral Tom Steffens, director of the Center for Intelligence and Information Operations at the U.S. Special Operations Command, Tampa, Florida, "Subject: Re: Interview," February 13, 2000.

27. Norbert Wiener, *Cybernetics or Control and Communication in the Animal,* (MIT Press, 1948).

28. For more on CERN, see its World Wide Web site: www.cern.ch.

29. E. T. Hall, *The Hidden Dimension* (Garden City, NY: Doubleday, 1966).

30. For more on the relationship between proximity and collaboration, see Thomas J. Allen, *Managing the Flow of Technology: Technology Transfer and the Dissemination of Technological Information within the R&D Organization* (Cambridge, MA: MIT Press, 1977). Data are given in *The Age of the Network,* p. 47.

31. From a slide developed by Shell's Network Learning & Support Center, 1999.

32. *Virtuous* is the term for positive feedback popularized by Peter Senge. See his book, *The Fifth Discipline: The Art and Practice of the Learning Organization* (New York: Doubleday/Currency, 1990).

Chapter 2

1. See Landmark Graphics at http://www.lgc.com/about/about.asp.

2. Interview with David Sibbet, January 24, 2000. See Grove Consultants, http://www.grove.com, David Sibbet's company's site.

3. *Networked Community Fieldbook,* Shell Oil Company, March, 1998.

4. McQuillen now heads Shell's Learning Center.

5. Ibid.

6. See Etienne Wenger, *Communities of Practice: Learning, Meaning, and Identity,* Cambridge University Press, 1999, and "Communities of Practice: The Organizational Frontier," by Wenger and William M. Snyder, Harvard Business Review, January 1, 2000, http://www.hbsp.harvard.edu/hbsp/prod_detail.asp?R00110.

7. Shell Services International had made this move the prior year.

8. The phrase, "Think globally, act locally," first was used by Rene Dubos, the two-time Nobel Laureate.

9. Economically Viable Alternative Green, an Australian environmental group, estimates that there were about 270,000 people on earth about 10,000 years ago (http://www.altgreen.com.au/population/How_many .html).

10. In regard to the structure of fire departments, for three years in the 1970s, we helped the U.S. Department of Commerce set up America's first national fire-prevention education program.

11. See "Australia to Share in 'Heavenly Twins,' " 18 February 1998, http:// www.science.org.au/academy/media/astro3.htm.

12. See "New ABB shows strong '99 earnings, cash generation," February 3, 2000, Press Information, http://www.abb.com.

13. Interview with Harry Brown, CEO, EBC Industries, Inc., January 10, 2000. For more on EBC, see *The TeamNet Factor,* pp. 137–139, and *The Age of the Network,* pp. 79–85.

14. See Wit Capital at http://www.witcapital.com/company.management.jsp; Ameritrade Holding Company at http://www.amtd.com/html/about5 .html; and Sony at http://www.world.sony.com/IR/Financial/AR/1999/ Management.html.

15. Interview with Mike Howland and Carol Willett, January 20, 2000, http://www.akgroup.com. For contact information, see Chapter 4, note 19.

Chapter 3

1. Buckman Labs was founded in 1945, the year we date the birth of the Information Age (see Chapter 2).

2. "The Power of Collaborative Knowledge," speech by Robert H. Buckman, delivered at "Lessons from the Front: Putting Knowledge Sharing to Work" seminar, U.S. Department of Defense, General Pershing Room, July 28, 1999.

3. Reuben Harris is now chair of Department of Systems Management, Naval Postgraduate School, Monterey, California.

4. Buckman Laboratories (A), ©Harvard Business School, N9-899-175, Rev. September 17, 1999, p. 5.

5. Interview with Sheldon Ellis, director, Bulab Learning Center, Memphis, TN, October 7, 1999.

6. Interview with Edson Peredo, president, Buckman Laboratories International, Inc., and chairman and CEO, Buckman Laboratories, Inc., Memphis, TN, October 8, 1999.

7. For more on the importance of the span of influence, see Reuben T. Harris, "Think Spans of Influence, Not Spans of Control," *The Tom Peters Group Update 1,* no. 2 (1991).

8. As recently as the mid-1980s, the standard model of small groups required a hunt through research in anthropology, sociology, organizational psychology, and management. At that time, there was a building consensus that a small group was a coherent system that one could study independently at the crossroads of several disciplines, but it was not a well-developed field. A decade later, a search of the literature on groups and teams turns up a coherent field of research.

9. A 1996 summary of current research quotes a respected researcher's 1984 review of the literature with approval.

10. An oft-quoted research definition of teams offers the three small-group characteristics together with a task-oriented purpose: "Teams are distinguishable sets of two or more individuals who interact interdependently and adaptively to achieve specified, shared, and valued objectives." Guzzo et al., *Team Effectiveness and Decision Making in Organizations* (San Francisco: Jossey-Bass, 1995), pp. 13, 115.

11. E. F. Schumacher, *Small Is Beautiful: Economics As If People Mattered,* (HarperCollins, 1989).

12. For more on the relationship between proximity and collaboration, see Thomas J. Allen, *Managing the Flow of Technology: Technology Transfer and the Dissemination of Technological Information within the R&D Organization* (Cambridge, MA: MIT Press, 1977). Data are given in *The Age of the Network,* p. 47.

Chapter 4

1. Interview with David Sibbet, January 24, 2000. See Grove Consultants, http://www.grove.com, his company's site.

2. This quote from historian Frederic Lane, which we found in *Making Democracy Work: Civic Traditions in Modern Italy,* by Robert D. Putnam (Princeton, NJ: Princeton University Press, 1993), p. 124, originally appeared in *Venice and History,* by Frederic C. Lane (Baltimore: Johns Hopkins University Press, 1966), p. 535. We are indebted to Putnam for much of the information on which this section is based.

3. This quote from *Making Democracy Work,* p. 129, is originally from *Before the Industrial Revolution: European Society and Economy, 1000–1700,* 2d ed., by Carlo M. Cippola (London: Methuen, 1980), pp. 198–199.

4. See *The TeamNet Factor,* pp. 157–159.

5. The rise of small business networks was the "hot news" that many business writers and reviewers picked out of *The TeamNet Factor.*

6. There was enormous disparity in social services between the north and the south. For example, Emilia-Romagna had one child-care center per 400 children; Campania, in the south, had one center per 12,560 children, or 300 percent fewer.

7. For the detailed analysis of Emilia-Romagna's "good government," reporting the study's composite index of institutional performance, see *Making Democracy Work,* p. 76.

8. Social capital has been a research topic and a concept under development for more than a decade, especially in sociology. See Ronald S. Burt, *Structural Holes: The Social Structure of Competition* (Cambridge, MA: Harvard University Press, 1992), for an excellent treatment. We use Putnam's formulation here.

9. The quote on reciprocity is from *Making Democracy Work,* p. 139 (see note 3).

10. For a superb three-part series on problems in the fishing industry, see "Troubled Waters: Fishing in Crisis," by Cohn Nickerson, whose first article, "Stripping the Sea's Life" (*The Boston Sunday Globe,* April 17, 1994), jumped from p. 1 to p. 24, where it had the headline "Greed, Mismanagement Ravage Fisheries."

11. The observation that cooperation becomes increasingly rational and practical is from *The Evolution of Cooperation,* by Robert Axelrod (New York: Basic Books, 1984).

12. The quote on defection is from Robert Sugden, as quoted in *Making Democracy Work*, p. 178 (see note 1).

13. James S. Coleman, "Social Capital in the Creation of Human Capital," *American Journal of Sociology* (1988 supplement), S98.

14. See Centra at http://www.centra.com.

15. Ibid.

16. Robert D. Putnam's new book: *Bowling Alone: The Collapse and Revival of American Community* (New York: Simon & Schuster, 2000).

17. Robert D. Putnam, "Bowling Alone: America's Declining Social Capital," *Journal of Democracy 6*, no. 1 (January 1995), pp. 65–78, and "Bowling Alone, Revisited," *The Responsive Community* (spring 1995), pp. 13–33.

18. Interview with Keoki Andrus, The Launch Group (see http://www.launchgroup.com), January 14, 2000.

19. Interview with Michael H. Howland, president and CEO, Applied Knowledge Group, 11921 Freedom Drive, Suite 550, Reston, VA 20190; 703/904-0304, http://www.akgroup.com, January 20, 2000.

20. Lipnack and Stamps, *The Age of the Network,* pp. 16–17, and *The TeamNet Factor,* p. 11; Adam M. Brandenberger and Barry J. Nalebuff, *Competition: A Revolutionary Mindset That Combines Competition and Cooperation: A Game Theory Strategy That's Changing the Game of Business* (New York: Doubleday, 1996).

21. For a superb treatment of this topic, see *Regional Advantage: Culture and Competition in Silicon Valley and Route 128,* by AnnaLee Saxenian (Cambridge, MA: Harvard University Press, 1994).

22. Ibid.

23. For an extended study of Harry Brown and EBC Industries, see Lipnack and Stamps, *The TeamNet Factor,* pp. 137–139, and *The Age of the Network*, pp. 79–85.

24. See *Grassroots Leaders in the New Economy: How Civic Entrepreneurs Are Building Prosperous Communities* by Douglas Henton, John Melville, and Kimberly Walesh (San Francisco: Jossey-Bass, 1997). Henton and his colleagues did the original research that led to the formation of Joint Venture Silicon Valley Network and have served as its principal consultants since its inception. For more information, contact them at: Collaborative Economics, 350 Cambridge Avenue, Suite 200, Palo Alto, CA 94306 (phone: 650/614-0230; fax: 650/614-0240; e-mail: CoEcon@aol.com).

Chapter 5

1. Joshua Meyrowitz, *No Sense of Place: The Impact of Electronic Media on Social Behavior* (New York: Oxford University Press, 1985).

2. For information about Sun's achievements, see http://www.sun.com/dotcom/whatis/index.html.

3. Motorola was the first recipient of the Malcolm Baldrige Award, the U.S. government's quality award (see Chapter 9, "Links").

4. The definition of Java is from http://java.sun.com/nav/whatis.

5. Sun Microsystems Inc.'s groups include System Products, Enterprise Services, Storage Products, Network Service Providers, Software Products & Platforms, iPlanet, Global Sales Operations, and Customer Advocacy.

6. E-mail from Suzie Grace, communications manager, Sun Microsystems Corporate Quality, "Subject: SunTeams details & key information," January 24, 2000.

7. From an interview with Jim Lynch, vice president of Sun's Corporate Quality Office, February 9, 2000.

8. *Ping* is an acronym for "Packet Internet or Inter-Network Groper." Loosely, ping means "to get the attention of" (http://www.whatis.com/ping.htm).

9. Interview with W. R. "Bert" Sutherland, director of SunLabs, Sun Microsystems, June 17, 1996.

10. Op. cit., Meyrowitz.

11. Interview with Meta Greenberg, January 2, 2000.

12. See Etienne Wenger, *Communities of Practice: Learning, Meaning, and Identity,* Cambridge University Press, 1999, and "Communities of Practice: The Organizational Frontier," by Wenger and William M. Snyder, Harvard Business Review, January 1, 2000 (http://www.hbsp.harvard.edu/hbsp/prod_detail.asp?R00110).

13. Interview with Loree Goffigon, director, Gensler Consulting, February 14, 2000.

14. The Education Development Center was founded in 1958 by a group of MIT scientists to develop a new curriculum for high school physics. Today it is an international research and development organization "dedicated to building talent and know-how for human advancement." See http://www.edc.org.

15. Ray Grenier and George Metes, *Going Virtual: Moving Your Organization into the 21st Century* (Upper Saddle River, NJ: Prentice Hall, 1995).

16. Lipnack and Stamps, *The TeamNet Factor,* pp. 31–34.

17. See *Virtual Teams,* 1st ed. (John Wiley & Sons, 1997), pp. 176–177.

18. Kathleen K. Mall and Sirkka L. Jarvenpaa, "Learning to Work in Distributed Global Teams." This paper is available online at http://www.bus.utexas.edu/~jarvenpaa/gvt/hicss.html.

Chapter 6

1. For more on "Stressed S," see *Virtual Teams,* pp. 142–144.

2. Ludwig von Bertalauffy, *General Systems Theory: Foundations, Development, Applications* (rev. ed.) (New York: George Braziller, 1968).

3. Lipnack and Stamps, *The TeamNet Factor,* pp. 221–223.

4. Senge, *The Fifth Discipline.*

5. Technically, *slowing* is negative feedback, *growing* is positive feedback.

6. Data on number of knowledge workers is from Steelcase-sponsored research conducted by The Futures Group in 1995.

7. Interview with Earnest Deavenport, former CEO, Eastman Chemical Company, 1996.

8. Jessica Lipnack and Jeffrey Stamps, "The Virtual Water Cooler: Solving the Distance Problem in Networks," *Firm Connections 1*, no. 2, May–June 1993.

Chapter 7

1. Lipnack and Stamps, *The Age of the Network,* pp. 52–58.

2. Peter F. Drucker, "The Age of Social Transformation," *Atlantic Monthly* (November 1994), pp. 36–41.

3. Peter F. Drucker, *Management Challenges for the 21st Century,* (New York, NY: HarperBusiness, 1999), see http://www.amazon.com/exec/obidos/ASIN/0887309984/o/qid=948109643/sr=2-1/104-9714499-1728465.

4. Dean W. Tjosvold and Mary M. Tjosvold, *Leading the Team Organization: How to Create an Enduring Competitive Advantage* (New York: Macmillan, 1991); Dean W. Tjosvold, *Working Together to Get Things Done: Managing for Organizational Productivity* (Lexington, MA: D.C. Heath, 1986).

Chapter 8

1. Interview with Dr. Henry McKinnell, president and chief operating officer, Pfizer Inc., president, Pfizer Pharmaceuticals, January 19, 2000.

2. See http://www.pfizer.com/pfizerinc/about/inside/mff.html.

3. E-mail from Stewart Brand, http://www.longnow.com, "Subject: Re: Is this you?" February 27, 2000: "In fall 1984, at the first Hackers' Conference, I said in one discussion session: 'On the one hand information wants to be expensive, because it's so valuable. The right information in the right place just changes your life. On the other hand, information wants to be free, because the cost of getting it out is getting lower and lower all the time. So you have these two fighting against each other.' That was printed in a report/transcript from the conference in the May 1985, *Whole Earth Review*, p. 49." Brand also mentions this idea in *The Media Lab* (Viking-Penguin, 1987), p. 202. "Since then," he writes, "I've added nothing to the meme, and it's been living high wide and handsome on its own. I saw in a *Wired,* April '97, that Jon Katz opined on p. 186: 'The single dominant ethic in this [digital] community is that information wants to be free.' "

4. See *Reinventing Government: How the Entrepreneurial Spirit Is Transforming the Public Sector* by David Osborne and Ted Gaebler (New York: Plume/Penguin, 1993). Osborne served as a key contributor to the National Performance Review.

5. Interview with Marion Metcalf, September 1993.

6. See http://www.context.org.

7. Marion Metcalf was active in various choral groups in the Washington D.C. area and served as president of the Board of Directors of the Capitol Hill Choral Society at the time of her death.

8. Interview with Bob Stone, January 27, 2000.

9. Andy Campbell, who served on the National Performance Review, came up with the name in a brainstorming session at the meeting.

10. To obtain a list of National Performance Review materials, send a one-line e-mail message via the Internet to almanac@esusda.gov with the following text: "send npr catalog," or send a letter via U.S. mail to National Performance Review, 750 17th Street NW, Washington, DC 20006 (phone: 202/632-0150).

11. In addition to the contacts listed in note 2, NetResults information is available on MetaNet (phone: 703/243-6622); CAPACCESS, an electronic service provided by George Washington University (phone: 202/986-2065); and Fed World, a U.S. Department of Commerce service (phone: 703/487-4608).

12. Interview with Bob Stone, January 27, 2000.

13. "INS: Integrated Card Production System," in "It Pioneers: The 21 winners of the Government Technology Leadership Awards forge into the IT frontier," by Joshua Dean, GovExec.com, December 1999, http://www.govexec.com/features/1299/1299s6.htm.

14. E-mail from Al Gilman, "Subject: Why you want to tell the story of Marion's award," January 21, 2000. See http://www.w3.org/WAI/PF.

15. "What Are We Going to Do with(out) Marion?" Eulogy by Larry Metcalf at her memorial service, December 17, 1999.

16. See Caucus at http://www.caucus.com.

17. E-mail from Jennifer Sutton, "Subject: Re: How are you and Al's e-mail," January 11, 2000. Sutton read poems at Marion Metcalf's memorial service.

18. Arthur Koestler, *The Ghost in the Machine* (London: Hutchinson & Co., 1967). The holon has been part of our conceptual family for three decades now. Jeff found the hierarchy concept so pervasive in the systems literature, and the word *holon* so elegant in capturing the essence of the idea, that he titled his doctoral dissertation (and his 1980 book by the same name) *Holonomy,* which means "the study of holons." The holon "wholepart" was first among the 10 principles of our first two books. Although we had sharpened the principles to five in *The TeamNet Factor* and *The Age of the Network,* in both books we reintroduced the holon idea at the very end as part of the underlying systems framework supporting the network principles.

19. Herbert Simon, "The Architecture of Complexity," *Proceedings of the American Philosophical Society,* 1962.

20. Luther P. Gerlach and Virginia Hine, *People, Power, Change: Movements of Social Transformation* (New York: Bobbs-Merrill, 1970).

21. Allen W. Johnson and Timothy Earle, *The Evolution of Human Societies: From Foraging Group to Agrarian State* (Palo Alto, CA: Stanford University Press, 1987), p. 52.

22. This is known as *metonomy* in that branch of cognitive science that looks at thinking through the categories (mental models) we use.

23. Lipnack and Stamps, *The Age of the Network,* p. 84, and *The TeamNet Factor,* pp. 47–49.

24. Glenn M. Parker, *Team Players and Teamwork: The New Competitive Business Strategy* (San Francisco: Jossey-Bass, 1991), p. 53.

25. See *Virtual Leadership.*

26. Johnson and Earle, *The Evolution of Human Societies,* p. 320.

27. Lipnack and Stamps, *The TeamNet Factor,* p. 13.

28. Research has repeatedly demonstrated the inverted U–shaped relationship between size and performance. Paul S. Goodman and Associates, *Designing Effective Work Groups* (San Francisco: Jossey-Bass, 1986), p. 16.

29. Robert Reich, "Entrepreneurship Reconsidered: The Team as Hero," *Harvard Business Review* (May–June 1987).

Chapter 9

1. The "only connect" quote is from *Howards End,* by E. M. Forster (London: Edward Arnold, 1910).

2. See http://www.icimod.org.sg/general/brochure1.htm.

3. E-mail from Mohan Kumar, via Dennis Roberson at Motorola, "Subject: Re: Geo? Again," January 31, 2000.

4. A T1 line is a high-speed digital connection capable of transmitting data at 1.5 million bits per second.

5. See ICIMOD site, note 2 above.

6. See *Tools for Thought* by Howard Rheingold (MIT Press, 2000) at http://www.rheingold.com/texts/tft/1.html.

7. Interview with Howard Rheingold, January 21, 2000.

8. *New Rules for the New Economy: 10 Radical Strategies for a Connected World* by Kevin Kelly (Penguin USA, October 1999).

9. We first met Roberson face-to-face at NCR's "Great Performers" recognition event in Barcelona, Spain, in April 1997.

10. Technically, this high-speed, high-bandwidth connection is called a *switched T1 line.*

11. From Groupe Speciale Mobile (French) that came up with the global digital standard (Global System for Mobile Communications), now adopted in more than 200 countries in Europe, Asia, and Africa. See GSM http://www.tmtouch.com.my/corporate/gsm.html.

12. Marshall McLuhan, *Understanding Media: The Extensions of Man* (New York: McGraw-Hill, 1964).

13. Interview with Terry Heng, Global Software, Motorola, January 28, 2000.

14. Nicholas Negroponte, *Being Digital* (New York: Knopf, 1995).

15. In 1989, Digital, bought by Compaq in 1997, had 150,000 employees, $13 billion in revenues, and the largest private computer network in the world.

16. For more information on the use of the word *matrix,* see Matrix Information and Directory Services at http://www.matrix.org.

17. William Issacs, *Dialogue and the Art of Thinking Together: A Pioneering Approach to Communicating in Business and Life* (Doubleday, 1999).

Chapter 10

1. Interview with Carol Willett, executive vice president, Innovation and Learning, Applied Knowledge Group, January 20, 2000.

2. Guzzo, Salas, and Associates, *Team Effectiveness and Decision Making in Organizations.*

Chapter 11

1. See *Learning After Doing, Another New Way of Working from The Network Learning & Support Center,* copyright © 1999, Shell Oil Company.

2. See http://www.teamflow.com for an example of deployment flowcharting.

Chapter 12

1. See *A Pattern Language,* by Christopher Alexander et al. (Oxford, England: Oxford University Press, 1977).

2. Arthur Koestler, *The Ghost in the Machine* (London: Hutchinson & Co., 1967). The holon has been part of our conceptual family for three

decades now. Jeff found the hierarchy concept so pervasive in the systems literature, and the word *holon* so elegant in capturing the essence of the idea, that he titled his doctoral dissertation (and his 1980 book by the same name) *Holonomy,* which means "the study of holons." The holon "wholepart" was first among the 10 principles of our first two books. Although we had sharpened the principles to five in *The Team-Net Factor* and *The Age of the Network,* in both books we reintroduced the holon idea at the very end as part of the underlying systems framework supporting the network principles.

3. Ludwig von Bertalauffy, *General Systems Theory: Foundations, Development, Applications* (rev. ed.) (New York: George Braziller, 1968).

Chapter 13

1. George Boole, *The Laws of Thought* (New York: Dover Publications, Inc., 1958).
2. *When Wizards Stay Up Late,* by Katie Hafner and Matthew Lyon (Touchstone, 1998), p. 27.
3. Ibid., 38.
4. For more information on Doug Engelbart's work, contact the Bootstrap Institute, 6505 Kaiser Drive, Fremont, CA 94555 (phone: 510-713-3550; e-mail: info@bootstrap.org; and see the Bootstrap Institute at http://www.bootstrap.org).
5. "A Conceptual Framework for the Augmentation of Man's Intellect," by Douglas Engelbart. See http://bootstrap.org/biblio.htm#04.
6. See *The Network Nation: Human Connection via Computer,* by Starr Roxanne Hiltz, Murray Turoff and Suzanne Keller.
7. George Lakoff, *Women, Fire, and Dangerous Things: What Categories Reveal about the Mind* (Chicago: University of Chicago Press, 1987).
8. See *Holonomy,* p. 13, for Rapoport reference.
9. See *Metaphors We Live By,* by George Lakoff and Mark Johnson (University of Chicago Press, 1983).
10. In the literature, this is called "source-path-goal."
11. Mark Johnson, *The Body in the Mind: The Bodily Basis of Meaning, Imagination, and Reason* (Chicago: University of Chicago Press).

Chapter 14

1. Olaf Stapledon, *Star Maker* (New York: Dover Publications, Inc., 1937).
2. For more information on the SETI project, see http://www.seti.org.
3. See John Lawrence at http://www.manageforresults.com and http://home.att.net/~jeslawrence/jeslawrencehomepage.html.
4. The Great Plains Partnership (GPP) was initiated by then-governor Mike Hayden of Kansas under the auspices of the Western Governors' Association, which maintains an active role in the group. For more information about GPP, see its home page: http://rrbin.cfa.org/rrbin/gpp/gpphome.html.
5. We thank David Williams of High Point, North Carolina, for sending us the article, "A Timely Warning to the Developed World" by Michael Valpy, *The Globe and Mail,* December 17, 1993, p. A2, from which the quote on social capital was taken.
6. Ashby's seminal article "Variety, Constraint, and the Law of Requisite Variety," drawn from his book, *An Introduction to Cybernetics* (London: Chapman and Hall, 1956), appears in *Modern Systems Research for the Behavioral Scientist: A Sourcebook,* edited by Walter Buckley (Chicago: Aldine, 1968), p. 129.
7. For the basis of this important concept, see "The Strength of Weak Ties," by Mark S. Granovetter, *American Journal of Sociology,* vol. 78, no. 6, pp. 1360–1380.
8. See *Structural Holes* (see note 13) for a similar idea that helps to maximize the efficiency and effectiveness of networks.
9. For more on Frank Starmer's global "lab without walls," see *The Age of the Network,* pp. 21–24.