

Joseph A. Tainter

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Education:

Ph.D., Anthropology, Northwestern University, June, 1975.

M.A., Anthropology, Northwestern University, June, 1973.

B.A., Anthropology, with honors, University of California at Santa Barbara, March, 1972.

Professional Positions

Professor, Department of Environment and Society, College of Natural Resources, Utah State University, Logan, Utah, 2009– .

Guest Professor, Alpen-Adria University and Vienna University of Business and Economics, Vienna, Austria, 2014.

Faculty Associate, Ecology Center, Utah State University, Logan, Utah, 2012– .

Guest Professor, Center for Studies of Science and Humanities, Beijing Normal University, Beijing, China, 2009.

Professor and Head, Department of Environment and Society, College of Natural Resources, Utah State University, Logan, Utah, 2007–2009.

Research Professor, Global Institute of Sustainability and School of Human Evolution and Social Change, Arizona State University, Tempe, Arizona, 2005–2007.

Project Leader, Cultural Heritage Research, Rocky Mountain Research Station, USDA Forest Service, Albuquerque, New Mexico, 1994 to 2005.

Archaeologist, USDA Forest Service, Albuquerque, New Mexico, 1978/80-1994.

Research Assistant Professor, Paleo-Indian Institute, Eastern New Mexico University, Portales, 1978-1979.

Assistant Professor of Anthropology, University of New Mexico, 1975-1978.

Major Media Appearances

Films

- 2015 *Breath of Life*. Directed by Susan Kucera.
- 2013 *Fall and Winter*. Directed by Matt Anderson.
- 2013 *Critical Mass*. Directed by Mike Freedman. A Day 600/Mike Freedman Film.
- 2008 *Blind Spot*. Produced by Adolfo Doring.
- 2007 *The 11th Hour*. Produced by Leonardo DiCaprio, Leila Connors Petersen, Brian Gerber, and Chuck Castleberry. Warner Independent Films.

Television (major)

- 2012 *American Collapse: Fear and Hope at the End of an Era*, by Herbert Krill. Broadcast 16 December 2012 on 3sat Television, Mainz, Germany.
- 2010 *Collapse*. National Geographic Channel, broadcast nationally 18 September 2010.
- 2010 *After Armageddon*. The History Channel, broadcast nationally 5 January 2010.
- 2009 *Earth 2100*. American Broadcasting Corporation, News Division. Broadcast nationally 2 June 2009 (3.7 million viewers).

Print (major)

- 2016 “The Lesson of Trump and Brexit: A Society Too Complex For its People Risks Everything,” by John Harris. *The Guardian*, December 29.
https://www.theguardian.com/commentisfree/2016/dec/29/trump-brexit-society-complex-people-populists?CMP=share_btn_tw
- 2016 “Quand L’Expansion Expire.” Interview in *Le Progrès M’a Tuer*, pp. 27-34. Le Pas de Côté and Léchappée, Vierzon and Paris.
- 2011 “Total Reboot,” by Bob Holmes. *New Scientist*, 26 March: 40-45.
- 2010 “It’s Complicated: Making Sense of Complexity,” by David Segal. *The New York Times*, April 30.
- 2009 “Crises of Complexity.” Interview by Kazys Varnelis. *Volume* 2009 #2, pp. 26-28.

- 2009 “De la Crise à l’Effondrement”, by Yves Sciama. *Les Cahiers de Science & Vie* 109 (Février-Mars): 22-28. (Issue topic: Les Civilisations: Sont-Elle Vouées à Disparaître?)
- 2008 “The End of Civilization” and “Are We Doomed,” by Debora MacKenzie. *New Scientist* April 5-11: 28-31 and 32-35. (Issue topic: The Collapse of Civilization: It’s More Precarious Than We Realized.)
- 2005 “Wovon Geht die Welt nun Unter?” by Thomas Häusler. *Facts*, No. 42, 20 October, pp. 64-67.

Radio (major)

- 2010-11 Interviews in *The Ron Smith Show*, WBAL Radio, Baltimore, MD. 10 September 2010 and 8 February 2011.
- 2010 Interview in *What Now, with Ken Rose*, KOWS Radio Occidental 107.3 FM. 28 June, 2010. (<http://www.pantedmonkey.org/>).

Internet

- 2018 “Scientists Want To Put A DNA Encyclopedia Of Human Civilization On The Moon,” by Dan Vergano. *Buzzfeed News*, September 29.
<https://www.buzzfeednews.com/article/danvergano/dna-encyclopedia-moon>
- 2017 “How Western Civilization Could Collapse”, by Rachel Nuwer. BBC Future, 18 April.
<http://www.bbc.com/future/story/20170418-how-western-civilisation-could-collapse>
(<http://tinyurl.com/lwa99p5>)
- 2011 http://www.youtube.com/results?suggested_categories=25%2C27%2C28%2C29&search_filter=0&search_query=%22joseph+tainter%22+site%3Ayoutube.com
(<http://tinyurl.com/3p53rpj>)
- 2010 “The Collapse of Complex Business Models”, by Clay Shirky.
<http://www.shirky.com/weblog/2010/04/the-collapse-of-complex-business-models/>
- 2010 Interview in the *Financial Sense News Hour*, 8 September 2010.
(<http://www.financialsense.com/financial-sense-newshour/in-depth/joseph-tainter-phd/the-collapse-of-complex-societies>).
- 2001 “Archaeology, History and Sustainability.” Audio presentation on *The Archaeology Channel* (<http://www.archaeologychannel.org/commentary/Tainter.html>).

Various other interviews with print, radio, and television journalists.

Selected Invited Presentations

2019 Tainter, J. A. Sustainability and Collapse: Complexity and Energy From Ancient to Modern Societies. Six lectures presented at the Department of History, University of Zürich, 5-6 April.

2018 Tainter, J. A. Sustainability and the Dilemma of Problem Solving. Presented at the Conference “Science and the Future 2: Contradictions and Challenges,” Università Degli Studi di Torino, 12-16 November.

2018 Tainter, J. A. The Roots of Complexity: Why Collapse is So Difficult to Understand. Presented at the Symposium on Cultural Evolution at the Royal Swedish Academy of Letters, History, and Antiquities, Stockholm, 7 March 2018.

2017 Tainter, J. A. Sustainability and Well Being: Energy, Technology, and Complexity. Keynote Address to the 10th Biennial International Workshop Advances in Energy Studies, Naples, Italy, 25-28 September 2017.

2017 Tainter, J. A. Can Technological Innovation Forever Exceed Resource Depletion? Keynote Address to the XIth Italian Conference on Environmental Sociology, Chieti-Pescara University, Chieti, Italy, 22-23 September 2017.

2017 Tainter, J. A. Sustainability and Collapse: Complexity and Energy From Ancient to Modern Societies. Seven lectures presented at the Department of History, University of Zürich, 21-22 April.

2016. Tainter, J. A. Resource Gain and Complexity: Past, Present, Future. Presented at the International Institute for Applied Systems Analysis, Laxenburg, Austria, 11 October 2016.

2016. Tainter, J. A. Complexity and Collapse. Presented to the Complexity Interest Group, Singapore, 27 January 2016.

2016. Tainter, J. A. Innovation, Complexity, and Cultural Heritage. Presented at the 3rd Singapore Heritage Conference “The Treasure of Human Experiences,” Nanyang Technical University, Singapore, 25-26 January 2016.

2015. Tainter, J. A. Energy and Complexity: How Evolution Causes Catastrophes. Keynote Address to the Conference “Crisis to Collapse: The Archaeology of Social Breakdown,” Université Catholique de Louvain, Louvain-la-Neuve, Belgium, 29-30 October 2015.

2015. Tainter, J. A. Energy Gain and Complexity: Using the Human and Ecological Past to Understand Our Future. Presented at the University of Leiden, 27 October 2015.

2015. Tainter, J. A. Sustainability and Innovation: Can We Always Offset Resource Depletion? Keynote Address to the Faculty of Architecture and Urbanism, Universidad Central de Venezuela, Caracas, 21 October 2015.

2015. Tainter, J. A. Energy and Catastrophe: What Links the Roman Empire to the Gulf Oil Spill? Keynote address to Cultura Chacao, Chacao Municipality, Caracas, Venezuela, 19 October 2015

2015. Tainter, J. A. Innovation in the City: Energy and Resource Efficiency. Keynote Address to the IXth Biennial International Workshop “Advances in Energy Studies,” Stockholm, 4-7 May 2015.

2015. Tainter, J. A. Sustainability and Collapse: Complexity and Energy From Ancient to Modern Societies. Seven lectures presented at the Department of History, University of Zürich, 16-18 April.

2015. Tainter, J. A. Resource Sustainability and Innovation. Presented at the European Commission Joint Research Centre Workshop “New Narratives for Innovation,” 26-27 February 2015, the Berlaymont Building, Brussels.

2014. Tainter, J. A. Complexity, Collapse, and Sustainability. Six lectures delivered at Alpen-Adria University and the Vienna University of Business and Economics, Vienna, 21-25 November 2014.

2014. Tainter, J. A. What is Transformation? Keynote Address to the Workshop “Social Transformations to Sustainability,” organized by the International Social Science Council and the Potsdam Institute for Advanced Sustainability Science, Potsdam, Germany, 17-19 November 2014.

2014. Tainter, J. A. Complexity and Collapse: What is the Role of Climate? Presented at the Conference “Past Climate Change and Societal Disruption,” Urbino, Italy, 17-20 June 2014.

2014. Tainter, J. A. Energy Gain and Complexity: Using the Human and Ecological Past to Understand our Future. Distinguished Lecture to the 2014 Annual Meeting of the Society for Economic Anthropology, Austin, TX, 24-26 April 2014.

2014. Tainter, J. A. Depletion and Innovation: The Sustainability Balancing Act. Inaugural Address to the “Center for Research in Sustainability, Collapse-Preparedness, and Information Technology,” Department of Informatics, University of California, Irvine, 14 February 2014.

2014. Tainter, J. A. Resource Trends: The Fundamental Question of Sustainability. Presented at the Center for Environment and Development Studies, Uppsala University, 23 January 2014.

2013. Tainter, J. A. Sustainability: The Fundamental Question. Presented at the Conference “Science and the Future,” Politecnico di Torino, 28-31 October 2013.
2013. Tainter, J. A. Energy Gain and the Evolution of Complexity. Keynote Address to the E-Futures Autumn Conference, *Challenges to a Sustainable Energy Future*, The University of Sheffield, 16-17 September 2013. Presented also at the Doctoral Training Centre in Low Carbon Technologies, University of Leeds, 18 September 2013.
2013. Tainter, J. A. Energy, Complexity, and Innovation. Presented at the Workshop “Getting Inside the Black Box: Technological Evolution and Economic Growth,” at the Santa Fe Institute, 7-30 August, 2013, Santa Fe, New Mexico.
2013. Tainter, J. A. and Temis G. Taylor. Complexity and Sustainability: What Makes a Society Resilient? Presented in the Workshop *Resilience and the Built Environment* at the Swiss Federal Institute of Technology, Zürich, 14-15 January 2013.
2012. Tainter, J. A. Problem Solving and the Evolution of Complexity. Presented at the Wenner-Gren Foundations Symposium on “Cultural Evolution—Patterns of Cultural Change and Diversification,” Stockholm, 13-15 September 2012.
2011. Tainter, J. A. Why Societies Collapse: What Does it Mean for Sustainability? Presented at the Symposium “Comment les Sociétés Décident-elles de Leur Survie?” at the Musée du quai Branly, Paris, 3 October.
2011. Tainter, J. A. Complexity and Collapse. Keynote Address to the Office of the Secretary of Defense Highlands Forum XLIV, *Failure and Collapse in Complex Systems*, Santa Fe, 26-28 June.
2011. Tainter, J. A. The Deepwater Horizon Blowout: Proximate and Ultimate Causes. Plenary Address to the Third Annual Biophysical Economics Conference, State University of New York, Syracuse, School of Environmental Science and Forestry, 15-16 April.
2011. Tainter, J. A. Sustainability Challenges, Past and Future. Presented at the John E. Sawyer Seminars on the Comparative Study of Cultures, *Energy Transitions and Society*, Boston University, 25 February.
2010. Tainter, J. A. Energy and Innovation: Contexts for Our Future. Presented at the Meeting “Hedge Fund Research Industry Summit: Outlook 2011,” Chicago, 17 November.
2010. Tainter, J. A. The Energy-Complexity Spiral. Presented at the 7th Biennial International Workshop, “Advances in Energy Studies: Can We Break the Addiction to Fossil Energy?,” Universitat Autònoma de Barcelona, 19-21 October.

2010. Tainter, J. A. Can Innovation Provide a Sustainable Lifestyle? Presented at the VIIIth International Media Forum on the Protection of Nature, "People Building Future: Limits and Values for a Sustainable Lifestyle," Associazione Culturale Greenaccord, Cuneo, Italy, 13-17 October.

2010. Tainter, J. A. Collapse and Sustainability: Lessons From History. Plenary address to the United States Regional Association of the International Association for Landscape Ecology, University of Georgia, 5-9 April.

2009. Tainter, J. A. Energy Transitions and Financial Crises, Past and Future. Presented at the Department of Archaeology and Ancient History, Uppsala University, Sweden, 3 November.

2009. Tainter, J. A. Biophysical Economics: Collapse and Sustainability. Plenary Address to the Second Annual Biophysical Economics Conference, State University of New York, Syracuse, School of Environmental Science and Forestry, 16 October.

2009. Tainter, J. A. Human Resource Use: Timing and Implications for Sustainability. Presented in the Symposium "Human Macroecology: Understanding Human-Environment Interactions Across Scales," at the 94th Annual Meeting of the Ecological Society of America, Albuquerque, 2-7 August.

2009. Tainter, J. A. Sustainability: Values, Resources, and Problem Solving. Six lectures delivered in the Institute of the History of the Environment and the Institute for the History and Philosophy of Science, Beijing Normal University, Beijing, China.

2009. Tainter, J. A. and T. F. H Allen. Energy Gain and Organization. Presented in the Plenary Symposium "Archaeology Beyond Archaeology" at the 74th Annual Meeting of the Society for American Archaeology, Atlanta, 22 April.

2009 The Logic of Collapse: Do Ethics Cause Catastrophes? Presented at the Conference "The Ethics of Catastrophe," Centre for Ethics, University of Toronto, 27-29 March.

2008. Tainter, J. A. Sustainability and Sustainable Development. Keynote Address to the VIth International Media Forum on the Protection of Nature, "Environment and Development for Third World Countries," Associazione Culturale Greenaccord, Viterbo, Italy, 26 November.

2008. Tainter, J. A. Energy: Thinking Long Term. Presented to Baraboo Growth LLC, Milwaukee, 10 September.

2008. Tainter, J. A. The Fundamental Elements of Being Sustainable. Presented at the Universidad Autónoma de Barcelona, 3 July.

2008. Tainter, J. A. The Jevons Paradox in Everyday Life. Presented at the 6th Biennial

International Workshop, “Advances in Energy Studies,” Graz University of Technology, 29 June to 2 July.

2008. Tainter, J. A. Energy Gain, Organization, and Sustainability. Presented at the Sustainable Energy Symposium, University of Rochester, 4-5 April.

2008. Tainter, J. A. What Does It Mean To Be Sustainable? Presented at the Torino Academy of Sciences, 12 March.

2008. Tainter, J. A. Complexity, Collapse, and Sustainability in Ancient and Modern Societies. Presented at the Department of Physics, University of Torino, 11 March.

2007. Tainter, J. A. Systems Thinking and Irreducible Uncertainty. Presented at the 28th Annual Meeting of the Society for Environmental Toxicology and Chemistry, Milwaukee, 11-15 November.

2007. Tainter, J. A. Climate, Energy, and Sustainability: A Fundamental Dilemma. Presented at the Interdisciplinary Round Table on Climate Change and Energy Strategies, Wasan Island, Lake Rosseau, Ontario, Canada, 14-15 September.

2007. Tainter, J. A. Sustaining Dryland Forests: Fundamental Questions. Presented at the Conference “Afforestation and Sustainable Forests as a Means to Combat Desertification,” Jerusalem, Israel, 16-19 April.

2007. Tainter, J. A. Sustainability, Complexity, and Problem Solving: Lessons From the Roman Empire. Presented at the Workshop “The Future of Earth and Humankind—A View From Asia,” Ōgata-mura, Akita Prefecture, Japan, 23-28 March.

2006. Tainter, J. A. Energy, Resources, and the Semantics of Sustainability. Presented at the Fifth Biennial Workshop, “Advances in Energy Studies,” Porto Venere, Italy, 12-16 September.

2006. Tainter, J. A. Energy Gain and Future Organization. Presented at the Sustainable Energy Forum 2006, “Peak Oil and the Environment,” Washington, DC, 7-9 May.

2005. Tainter, J. A. and C. R. Crumley. Climate, Complexity, and Problem Solving in the Roman Empire. Prepared for the 96th Dahlem Workshop *Integrated History and the Future of People on Earth (IHOPE)*, Freie Universität, Berlin, 12-17 June.

2005. Tainter, J. A. and T. F. H. Allen. Energy Gain and Complexity: Implications for Human Ecology in the Amazon Basin. Presented at the Santa Fe Institute Workshop “Anthropogenic Landscapes: Social and Environmental Complexity in Lowland Latin America,” Florianópolis, Santa Catarina, Brazil, 24-28 May.

2005. Tainter, J. A. Energy, Problem Solving, and Sustainability in the Roman Empire. Presented at the 2005 Norris and Margery Bendetson EPIIC International Symposium “Oil and Water,” Tufts University, Medford, Massachusetts, 24 February.

2005. Tainter, J. A. Ecological vs. Social Complexity: An Anthropological Perspective on a Science of Sustainability. Presented in the Anthropology Colloquium Series and the International Institute for Sustainability Wrigley Lecture Series on Sustainability, Arizona State University, Tempe, 28 January.

2004. Tainter, J. A. Why Complexity Grows. Presented at the Technology Transfer Institute/Vanguard Conference “The Challenge of Complexity,” Los Angeles, 28 September.

2004. Tainter, J. A. Sustainability and Complex Problem Solving. Presented at the 22nd Annual Meeting of the Balaton Group, Zirc, Hungary, 11 September.

2004. Tainter, J. A. Scale, Information, and Power in Ages of Globalization. Presented in the Session “Complexity, Uncertainty and Managing for Sustainability—a Tribute to the Life and Work of James Kay,” at the Eighth Biennial Scientific Conference of the International Society for Ecological Economics, Montréal, 12 July.

2004. Tainter, J. A. Complexity and Sustainability in Human Systems. Presented at the Gordon Research Conference *The Metabolic Basis of Ecology*, Bates College, Lewiston, Maine, 7 July.

2004. Tainter, J. A. Co-Evolution of Complexity and Problem Solving. Presented at the VIth Annual Workshop “Co-Evolution of Behaviors and Institutions” at the Santa Fe Institute, Santa Fe, 24 January.

2003. Tainter, J. A. The Development of Social Complexity: Models of Collapse, Resiliency, and Sustainability. Presented in “The Stockholm Seminars: Frontiers in Sustainability Science and Policy,” at The Royal Swedish Academy of Sciences, Stockholm, 24 September.

2003. Tainter, J. A. Social and Ecological Systems in Convergent Evolution: Local Impacts of World Systems. Presented at the Conference “World System History and Global Environmental Change,” Lund University, Lund, Sweden, 20 September.

2003. Tainter, J. A. Complexity and Problem Solving, Part I: Social Complexity. Presented in the Symposium “Ecological Complexity and Sustainability” at the 88th Annual Meeting of the Ecological Society of America, Savannah.

2002. Tainter, J. A. Historical Studies in Collapse, Resiliency, and Sustainability. Presented at the Institute of Geography, University of Paris I (Panthéon-Sorbonne), Paris, France.

2002. Tainter, J. A. Material Culture Distributions in Time and Space: Shifting Expressions of

Cultural Identity in the Prehistoric Southwestern United States. Presented at the School of Archaeology, University of Paris I (Panthéon-Sorbonne), Paris, France.

2002. Tainter, J. A. The Development and Collapse of Political Complexity at Cahokia in the American Midwest. Presented at the School of Archaeology, University of Paris I (Panthéon-Sorbonne), Paris, France.

2002. Tainter, J. A. Societal Metabolism in the Roman Empire. Presented at the Third Biennial Workshop “Advances in Energy Studies: Reconsidering the Importance of Energy,” Porto Venere, Italy.

2002. Tainter, J. A. Ecological Integrity and Problem Solving in Natural Resource Management. Presented at the Third Biennial Workshop “Advances in Energy Studies: Reconsidering the Importance of Energy,” Porto Venere, Italy.

2001. Tainter, J. A. Archaeology, History, and Sustainable Problem Solving. Presented at the 167th Annual Meeting of the American Association for the Advancement of Science, San Francisco.

1998. Tainter, J. A. Comparative Responses to Climate Change: Comments on the Symposium “The Ancient Mande Landscape: Climate Change and Human Response.” Presented at the Fourth International Conference on Mande Studies, Serrekunda, The Gambia.

1998. Tainter, J. A. Introduction to the Plenary Session “Archaeology and Contemporary Environmental Change.” Presented at the 63rd Annual Meeting of the Society for American Archaeology, Seattle.

1998. Tainter, J. A. Cahokia: the Cost and Meaning of Complexity. Presented at the conference “Forgotten Cities” at the Asia Society and New York University, New York.

1997. Tainter, J. A. Critical Analysis and Cultural Landscapes in Heritage Management. Presented at the Annual Conference of the Theoretical Archaeology Group, Bournemouth University, Bournemouth, England.

1996. Tainter, J. A. Cultural Conflict and Sustainable Development: Managing Subsistence Hunting in Alaska. Presented at the 7th Annual Conference of the International Boreal Forest Research Association, St. Petersburg, Russia.

1994. Tainter, J. A. Are Complex Societies Sustainable? Perceiving Fundamental Issues. Plenary Address to the Third International Conference of the International Society for Ecological Economics, San José, Costa Rica.

1994. Tainter, J. A. Explaining Why Complex Societies Collapse. Presented in the Director’s

Lecture Series, Getty Research Center, Santa Monica.

1994. Tainter, J. A. Forces of Reaction and Changes of Scale in the World System of States. Presented at the conference “The State Under Siege: Political Disintegration in the Post-Cold War Era,” New York Academy of Sciences, New York.

1991. Tainter, J. A. Why Civilizations Collapse. Presented to the Systems Dynamics Group, MITRE Corporation, McLean, Virginia.

1991. Tainter, J. A. Evolutionary Consequences of War. Presented at the Conference “Effects of War on Society,” Center for Interdisciplinary Research on Social Stress, San Marino.

Books

2013 Tainter, J. A. *L’Effondrement des Sociétés Complexes*. Le Retour aux Sources, La Fenderie, Aube.

2012 Tainter, J. A. and T. W. Patzek. *Drilling Down: The Gulf Oil Debacle and Our Energy Dilemma*. Copernicus Books, New York.

2010 Tainter, J. A. *FuZha SheHui de BengKui*. Cambridge University Press, Cambridge, and Hainan Publishing House, Haikou, China.

2009 Tainter, J. A. *Kolapsy Složitých Společností*. Nakladatelství Dokořán, Prague.

2007 Tainter, J. A. *Kolaps Komplexnih Društava*. Naklada Jesenski i Turk, Zagreb.

2003 Allen, T. F. H., J. A. Tainter, and T. W. Hoekstra. *Supply-Side Sustainability*. Columbia University Press, New York.

2000 McIntosh, R. J., J. A. Tainter, and S. K. McIntosh (eds.). *The Way the Wind Blows: Climate, History, and Human Action*. Columbia University Press, New York.

1999 Tainter, J. A. *Moon Myung ay Bung Geh*. Daewon Publishing Company, Seoul.

1996 Tainter, J. A. and B. B. Tainter (eds). *Evolving Complexity and Environmental Risk in the Prehistoric Southwest*. Santa Fe Institute, *Studies in the Sciences of Complexity*, Proceedings Volume XXIV. Addison-Wesley, Reading.

1988 Tainter, J. A. *The Collapse of Complex Societies*. Cambridge University Press, Cambridge.

Monographs and Other Volumes

- 2004 McIntosh, R. J. and J. A. Tainter (eds.). *Climates of the Mande. Mande Studies 6*: 1-82.
- 1997 Tainter, J. A. (ed.) *Archeology of the Farmington Sector of the Elena Gallegos Project*. USDA Forest Service, Southwestern Region, *Heritage Resources Management Report 16*.
- 1995 Finch, D. M. and J. A. Tainter (eds.). *Ecology, Diversity, and Sustainability of the Middle Rio Grande Basin*. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, *General Technical Report RM-268*.
- 1995 Tainter, J. A. (ed.). *Archeology of the Albuquerque Sector of the Elena Gallegos Project*. USDA Forest Service, Southwestern Region, *Heritage Resources Management Report 14*.
- 1988 Tainter, J. A. and R. H. Hamre (co-editors). *Tools to Manage the Past: Research Priorities for Cultural Resources Management in the Southwest*. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, *General Technical Report RM-164*. iii + 214 pp.
- 1987 Tainter, J. A. and F. Levine. *Cultural Resources Overview, Central New Mexico*. USDA Forest Service, Southwestern Regional Office and USDI Bureau of Land Management, New Mexico State Office, Albuquerque and Santa Fe.
- 1984 Tainter, J. A. (ed.). *Predictive Modeling and the McKinley Mine Dilemma. American Archaeology 4*: 82-113.
- 1980 Tainter, J. A. and David A. Gillio. *Cultural Resources Overview, Mt. Taylor Area, New Mexico*. USDA Forest Service, Southwestern Regional Office and USDI Bureau of Land Management, New Mexico State Office, Albuquerque and Santa Fe.
- 1971 Tainter, J. A. *Salvage Excavations at the Fowler Site: Some Aspects of the Social Organization of the Northern Chumash. San Luis Obispo County Archaeological Society, Occasional Papers No. 3*.

Articles

- 2019 Tainter, J. A. *Scale and Metabolism in Ancient Cities*. In *Understanding Urban Ecology: An Interdisciplinary Systems Approach*, edited by Myrna H. P. Hall and Stephen B. Balogh, pp. 85-99. Springer Nature Switzerland, Cham.
- 2019 Tainter, J. A. and T. F. H. Allen. *Energy Gain and the Evolution of Organization*. In *The*

- Oxford Handbook of Historical Ecology and Applied Archaeology*, edited by Christian Isendahl and Daryl Stump, pp. 558-577. Oxford University Press, Oxford.
- 2019 Arnold, M, J. A. Tainter, and D. Strumsky. Productivity of Innovation in Biofuel Technologies. *Energy Policy* 124: 54-62.
- 2018 Tainter, J. A., V. L. Scarborough, and T. F. H. Allen. Resource Gain and Complexity: Water Past and Future. In *Water and Society From Ancient Times to the Present: Resilience, Decline, and Revival*, edited by Federica Sulas and Innocent Pikirayi, pp. 328-347. Routledge, London.
- 2018 Allen, T. F. H., P. Austin, M. Giampietro, Z. Kovacic, E. Ramly, and J. Tainter. Mapping Degrees of Complexity, Complicatedness, and Emergent Complexity. *Ecological Complexity* 35: 39-44.
- 2018 Tainter, J. A. Modelling the Mysterious Maya. *Nature Sustainability* 1: 79-80.
- 2018 Tainter, J. A., D. Strumsky, T. G. Taylor, M. Arnold, and J. Lobo. Depletion vs. Innovation: The Fundamental Question of Sustainability. In *Physical Limits to Economic Growth: Perspectives of Economic, Social, and Complexity Science*, edited by Roberto Burlando and Angelo Tartaglia, pp. 65-93. Routledge, London.
- 2018 Tainter, J. A. Understanding Sustainability Through History: Resources and Complexity. In *Routledge Handbook of the History of Sustainability*, edited by Jeremy Caradonna, pp. 40-56. Routledge, London.
- 2017 Casazza, M., J. A. Tainter, M. Lega, S. Viglia, G. Liu, and S. Ulgiati. Energy Features of Human Socio-Ecological Systems Relevant to the Future of Civilization. In *Energy Futures, Environment and Well-Being: Proceedings of the 10th Biennial International Workshop Advances in Energy Studies*, edited by Sergio Ulgiati and Laura Vanoli, pp. 68-75. Parthenope University of Naples, Naples.
- 2017 Allen, T. F. H., J. A. Tainter, D. Shaw, M. Giampietro, and Z. Kovacic. Radical Transitions From Fossil Fuel to Renewables: a Change of Posture. In *Complex Systems and Social Practices in Energy Transitions*, edited by Nicola Labanca, pp. 221-235. Springer International, Cham, Switzerland.
- 2016 Tainter, J. A. Agriculture and the Energy-Complexity Spiral. *Behavioral and Brain Sciences*. Online: doi:10.1017/S0140525X1500059X, e92.
- 2016 Taylor, T. G. and J. A. Tainter. The Nexus of Population, Energy, Innovation, and Complexity. *American Journal of Economics and Sociology* 75: 1005-1043.

- 2016 Tainter, J. A. Why Collapse is So Difficult to Understand. In *Beyond Collapse: Archaeological Perspectives on Resilience, Revitalization, and Transformation in Complex Societies*, edited by Ronald K. Faulseit, pp. 27-39. Center for Archaeological Investigations, Southern Illinois University Carbondale, *Occasional Paper 42*. Southern Illinois University Press, Carbondale.
- 2015 Tainter, J. A. Our Energy Dilemma (or will fish discover water?) In *More!*, edited by Marianne Thieme. E-Book Animal Politics Foundation, Amsterdam and Uitgeverij Jan van Arkel, Utrecht. In Arabic, Dutch, English, French, and German.
- 2015 Tainter, J. A., T. G. Taylor, R. G. Brain, and J. Lobo. Sustainability. In *Emerging Trends in the Social and Behavioral Sciences*, edited by Robert Scott and Stephan Kosslyn. John Wiley and Sons. [Online: wileyonlinelibrary/ref/emergingtrends]
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