

CAROL E. CLELAND

(2008)

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University of Colorado
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EDUCATION:

Ph.D. in philosophy, Brown University, 1981.

B.A. in mathematics, University of California at Santa Barbara, 1973.

PROFESSIONAL EXPERIENCE:

Full Professor (2006-present), University of Colorado, Philosophy Department, Boulder, CO 80309

Associate Professor (1993-2006), University of Colorado, Philosophy Department, Boulder, CO 80309.

Visiting Researcher (2002-2003), Centro de Astrobiologia, Madrid, Spain.

Exchange Professor (1998-99), Australian National University, Philosophy Department, Canberra, ACT, Australia.

Assistant Professor (1986-1993), University of Colorado, Philosophy Department, Boulder, CO 80309.

Postdoctoral Fellow in Philosophy and Computer Science (1985-86), Center for The Study of Language and Information (CSLI), Ventura Hall, Stanford University, Stanford, CA 94305.

Software Engineer (1984-85), Motion Analysis Corporation, Santa Rosa, CA, 95401.

Assistant Professor (1981-84), Wheaton College, Department of Philosophy, Norton, MA 02766.

Instructor (1979-81), Wheaton College, Department of Philosophy, Norton, MA 02766.

Graduate Student (1975-81), Brown University, Philosophy Department, Providence, R. I. 02903.

Systems Programmer (1973-74), Culler-Harrison, Inc., Santa Barbara, CA.

AREAS OF TRAINING:

Areas of Specialization

Philosophy of Science, Philosophy of Logic, Metaphysics.

Areas of Competence

Logic, Epistemology, History of Modern Philosophy (Descartes, Leibniz and Hume), Contemporary Analytic Philosophy.

TEACHING EXPERIENCE

Undergraduate

Courses: Philosophy of Science (introductory & advanced); Metaphysics (introductory & advanced); Epistemology (introductory & advanced); Logic (introductory & advanced); History of Modern Philosophy; Twentieth Century Philosophy; Critical Thinking; Philosophy of Mind; Introduction to Philosophy; Senior Seminar on Leibniz.

Thesis Supervision: 11 undergraduate theses.

Graduate

Courses: Causation, Causation and Events; Connectionism and the Mind/Body Problem; Philosophy of Quantum Mechanics; Is a Naturalistic Theory of Intentionality Possible?; The Nature of Scientific Explanation; Independent Studies (in Computation, Causation, Philosophy of Mind, and Scientific Explanation); What is life?; Philosophical Problems in Astrobiology.

Thesis Supervision

Principle Advisor: 4 Ph.D. students, 5 M.A. Students.

Member of Committees: 7 Ph.D. students (philosophy), 4 M.A. students (philosophy), 5 Ph.D. students (mathematics), 1 Ph.D. student (astronomy), 1 Ph.D. student (English), 1 Ph.D. student (computer science).

SCHOLARLY WORK:

Articles

- “The Structure and Justification of Historical Natural Science; Critical response and further developments (under review).
- “Life without Definitions”, *Synthese* (forthcoming).
- “Signatures of a shadow biosphere” (Davies, P., **Cleland, C.**, Benner, S., Lineweaver, C. & C. McKay), *Astrobiology* (in press).
- “Philosophical issues in natural history and its historiography” forthcoming in Tucker, A. (ed), *Blackwell Companions to Philosophy: A Companion to the Philosophy of History and Historiography*. Oxford: Blackwell Pub. (forthcoming 2008).
- “Epistemological issues in the study of microbial life: alternative biospheres,” *Stud. Hist. Phil. Bio. & Biomed. Sci.* 38 (2007), pp. 847-861.
- “Does ‘life’ have a definition?” (**Cleland, C.** & Chyba, C.), in Sullivan and Baross (eds.), *Planets and Life: The Emerging Science of Astrobiology*, Ch. 5. Cambridge: Cambridge University Press. (2007), pp. 119-131.
- “A Shadow Biosphere,” *Astrobiology Magazine*, December 1, 2006, pp. 1-4.
- “The Church-Turing Thesis: A last vestige of a failed mathematical program,” in Olszewski, A., Wolenski, J. and R. Janusz (eds.), *Church’s Thesis after Seventy Years*. Berlin: Ontos Verlag (2006) pp. 119-146.
- “The Possibility of Alternative Microbial Life on Earth,” (**Cleland, C.** & Copley, S. D.), *International Journal of Astrobiology* 4 (2005), pp. 165-173.
- “Understanding the Nature of Life: A Matter of Definition or Theory,” in Seckbach, J. (ed.), *Life as We Know It*. (Vol. 10 of the *Cellular Origins, Life in Extreme Habitats and Astrobiology Series*). Berlin: Springer (2006), pp. 589-600.
- “Keith M. Parsons, ‘Drawing Out Leviathan: Dinosaurs and the Science Wars’” *Philosophy of Science* 71 (2004), pp. 605-607.

- "The Concept of Computability," *Theoretical Computer Science* 317/1-3 (2004), pp. 209-225.
- "Why it is a mistake to define 'life'," in Bedau, Husbands, et al. (eds), *Artificial Life IX Workshop Proceedings* (2004), pp. 93-95.
- "Defining 'Life'" (with Christopher Chyba), *Origins of Life and Evolution of the Biosphere* 32(4) (2002), pp. 387-93.
- "Methodological and Epistemic Differences Between Historical Science and Experimental Science," *Philosophy of Science* 69 (2002), pp. 474-496.
- "On Effective Procedures," in Carol E. Cleland (guest editor) *Minds and Machines* (special volume, *Effective Procedures*) 12 (2002), pp. 159-179.
- "Reply to Kevin Kilty's 'Comment on: Historical science, experimental science, and the scientific method'," *Geology* 30 (2002), pp. 951-952.
- "Reply to R. J. Bailey's 'Comment on: Historical science, experimental science, and the scientific method'," *Geology* 30 (2002), pp. 953-954.
- "Historical science, experimental science, and the scientific method," *Geology* 29 (2001), pp. 987-990.
- "Recipes, Algorithms, and Programs," *Minds and Machines* 11 (2001), pp. 219-237.
- "David Miller, 'Critical Rationalism,'" *The Philosophy Quarterly* (1997), pp. 400-404.
- "Standards of Evidence: How High for Ancient Life on Mars?," *The Planetary Report Vol. XVII No.1* (1997), pp. 20-21.
- "Moore, G. E., 'Lectures on Metaphysics 1934-35,'" *The Review of Metaphysics* March (1995), pp. 671-673.
- "Effective Procedures and Computable Functions," *Minds and Machines* 5 (1995), pp. 9-23.
- "John Carroll, 'Laws of Nature,'" *The Review of Metaphysics*, December (1995), pp. 406-408.
- "Jonathan Bennett, 'Events and their Names,'" *Noûs* Vol. XXVIII, No. 1 (1994), pp. 103-109.
- "Is the Church-Turing Thesis True?," *Minds and Machines* 3 (1993), pp. 283-312.
- "The Church/Turing Thesis: Procedures, Processes and Causation," *ICS Technical Report*, No. 92-04 (1992), pp. 1-38.
- "On the Individuation of Events," *Synthese*, Vol 86 (1991), pp. 229-254. (Reprinted in R. Casati & A. Varzi (eds.) *Events*. Dartmouth 1996, pp. 373-400).
- "The Difference Between Real Change and Mere Cambridge Change," *Philosophical Studies*, Vol 60 (1990), pp. 257-280.
- "Is Smolensky's Treatment of Connectionism on the Level?" *Behavioral and Brain Sciences* 11:1 (1988), pp. 27-28.
- "Change, Process and Events," *CSLI Report*, No. CSLI-87-95 (1987), pp. 1-36.
- "Causality, Chance and Weak Non-Supervenience," *American Philosophical Quarterly*, Vol. 22 (1985), pp. 287-298.
- "Space: An Abstract System of Non-Supervenient Relations," *Philosophical Studies*, Vol. 46 (1984), pp. 19-40.

Volumes:

The Quest for a Universal Theory of life: Searching for life as we don't know it (under contract with Cambridge University Press, in progress).

The Nature of Life: Classic and Contemporary Readings (Bedau, M. & Cleland, C., eds.), Cambridge: Cambridge University Press (forthcoming in 2009).

Effective Procedures, (guest editor) special volume of *Minds and Machines*, 12 (2002).

SELECTED PRESENTATIONS:

“What is life?” (invited), Astrobiology: Expanding our Views of Society and Self, Biosphere II, University of Arizona, May 9, 2008.

“The Evolution of Microbial Life on Earth: Tree or Forest” (invited), Darwin Day Symposium: Origin & Early Evolution of Life, *National Evolutionary Synthesis Center*, Feb. 8, 2008.

“Could there be undetected alternative forms of microbial life on earth?”, *International Society for the History, Philosophy, and Social Studies of Biology*, Exeter, England, July 12, 2007,

“Has alien life been detected already? (invited), Tree or Forrest? Searching for Alternative Forms of Life on Earth (workshop), Arizona State University, Tempe, Dec. 9, 2006.

“Epistemological issues in the study of microbial life: Alternative Terran Biospheres (invited), Philosophical and Social Dimensions of Microbiology (workshop), University of Exeter, England, July 14, 2006.

“Answering the question ‘what is life?’” (invited), Templeton Lecture, University of Arizona, Tucson, Arizona, May 11, 2006.

“Answering the Question ‘What is life?’” (invited), AAAS, Feb 18, 2006.

“Epistemic and methodological differences between historical science and classic experimental science” (invited), Center for the History and Philosophy of Science, University of Minnesota, October 21, 2005.

“What is life?” *International Society for the History, Philosophy, and Social Studies of Biology*, Guelph, Canada, July 16, 2005.

“Answering the Question ‘What is life?’” (invited), Center for Astrobiology and the Origin of Life, Harvard University, May 23, 2005.

“Searching for a General Theory of Living Systems” (invited presenter), *Dibner Seminar in the History and Philosophy of Biology*, MBL, Woods Hole, MA, May 20, 2005.

“Defining ‘Life’” (invited), *American Philosophical Association* (Pacific Division), March 25, 2005.

“Why it is a mistake to define ‘life’” (invited), *ALIFE9*, Boston, MA, Sept. 12, 2004.

“The Advent of Historical Science” (invited), Woodfest (The New Astronomy: Opening the Electromagnetic Window and Expanding our View of Planet Earth), University of Washington, Seattle, Washington, June 16, 2004.

“Rethinking the justification of phylogenetic methods” (invited), *A. Watson Armour III Spring Symposium: Systematics at a Crossroads Again: Biological and Philosophical Arguments in Contemporary Phylogenetics*, Chicago, May 10, 2003.

“The Concept of Computability” (invited). *American Mathematical Society* (Special Session: “Beyond classical Boundaries of computability”), May 4, 2003.

“Defining ‘life’” (invited). Inaugural Ceremonies, *Centro de Astrobiologia*, Madrid, Spain, January 16, 2003.

“Historical Science, Experimental Science, and the Scientific Method” (invited), Department of Earth Resources, Colorado State University, October 7, 2002.

- “Defining ‘life’” (invited), *ISSOL’02* (13th International Conference on the Origin of Life). Oaxaca, Mexico, July 4, 2002.
- "What is Life?" (invited). AAAS (workshop on the nature of life), Washington D.C., March 5, 2001.
- “Effective Procedures and Causal Processes” (invited), *Hypercomputation Workshop*, London, England, May 24, 2000.
- “Life in ALH84001: Confirming the Best Explanation”, *NASA Institute of Astrobiology* (Video-Seminar), Jan. 20, 2000.
- “Recipes, Algorithms, and Programs” (invited), *American Philosophical Association* (Eastern Division), Dec. 28, 1999.
- “Recipes, Algorithms, and Programs” *Australasian Association of Philosophy*, Melbourne (Logic Stream), Australia, July 10, 1999.
- "Standards of Evidence" (invited). Mars Meteorite Symposium, University of Colorado (Boulder), August 29, 1996.
- "On the Nature of Computation" (invited). Symposium on Computation, *Society for Philosophy and Psychology*, San Francisco State University, June 1996.
- "Response to Horsten's "Can Turing Machines Bake Cakes?" (invited). *American Philosophical Association* (Midwest Division), April 29, 1995.
- "The Convenience of Spatial Relations" (invited). Symposium on Symmetrical Universes, *American Philosophical Association* (Pacific Division), March 30, 1995.
- "The Church/Turing Thesis: Procedures, Processes and Causation" (invited). University of California (Davis), Nov. 22, 1991.
- "Events and Modes of Change," Center for the Study of Language and Information, Stanford University, April, 1986.
- "Space as an Abstract System of Non-Supervenient Relations" (invited) Symposium on Space and Time, University of California at Davis, June 6, 1985

HONORS, AWARDS & GRANTS:

- NASA Astrobiology Institute, 2nd round funding (Grant to Cleland, PI, and the University of Colorado’s Center for Astrobiology, CO-I), 2004-2008.
- NASA Astrobiology Institute (Grant to Cleland, PI, and the University of Colorado’s Center for Astrobiology, CO-I), 1999-2004.
- GCAH (Graduate Committee on the Arts and Humanities) Grant, University of Colorado (Boulder), 1991 (spring), 1998 (spring).
- Nominated for SOAR Outstanding Teacher Award, 1992 (spring).
- Institute of Cognitive Science Grant, University of Colorado (Boulder), 1987 (winter) & 1989 (fall).
- CSLI (Center for the Study of Language and Information) Postdoctoral Fellowship in Philosophy and Computer Science, Stanford University, 1985-86.
- Mellon Grant, Wheaton College, 1982 (summer) & 1980 (summer).
- FIPSE Grant, Wheaton College, 1982 (spring).
- NEH Postdoctoral Fellowship, Institute on Psychology and Philosophy of Mind, University of Washington, 1981 (summer).
- Fellowships, Philosophy Department, Brown University, 1975-78.

COMMUNITY, PROFESSIONAL AND UNIVERSITY SERVICE:

Philosophy Department

Committee on the History and Philosophy
of Science

Member 4/88-6/92
Chair 8/03-present

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|---|-------------------|-------------------------------|
| Program Review ("Self Study") | | 6/95-96, 6/03-04 |
| Faculty Reappointment Committees | | (on & off) |
| Graduate Admissions Committee | Member | 6/94-6/95 |
| | Chair | 8/04-6/05 |
| Departmental Honors Advisor | | 6/94-96 |
| Ad Hoc Committee on Improving Teaching | | 8/92-6/93 |
| Undergraduate Advisor | | 1991-96 |
| Curriculum Committee | Chair | 8/91-8/92 |
| | Member | (on & off) |
| Salary Committee | | (on & off) |
| Personnel Committee | | (on & off) |
| Faculty Advisor to the Undergraduate Philosophy Club | | 9/87-6/91 |
| Graduate Teaching Mentor | | 9/87-6/88 |
| Fellowships and Appointments Committee | | 9/87-6/88 |
| Ad Hoc Committee for Prelim Reform | | 1/87-6/87 |
| Graduate Prelim Exam Committee on Metaphysics and Epistemology | Chair, Member, | 9/86-6/87, 9/89-93 9/86-93 |
| Colloquium Committee | | 9/86-6/88 |
| Graduate Studies Committee | | 9/86-6/87 |
| <u>Center for Astrobiology</u> | | 8/98-present |
| <u>Institute of Cognitive Science (ICS)</u> | | |
| Member | | 1/87-present |
| Curriculum Committee | | 10/89-91 |
| Executive Committee | | 7/88-7/90 |
| Personnel Committee (joint positions with Computer Science) | | 1/87-6/88 |
| Joint ICS/Philosophy Colloquium Series Committee | Chair, | 1/90-6/97 |
| <u>College of Arts and Sciences</u> | | |
| A & S Council | | 8/96-6/98 |
| A & S Committee on Committees | | 1/97-6/98 |
| A & S Budget Committee | | 1/97-6/98 |
| <u>University of Colorado</u> | | |
| Executive Advisory Council of the Graduate School | | 8/04-present |
| President's Fund for the Humanities | | 6/93-6/97 |
| BFA | | 8/99-2003 |
| Student Affairs Committee | | 8/99-2003 |
| Committee on Women | | 7/92-6/94 |
| Core Advisor for College of Arts & Sciences | | 5/92-8/92 |
| <u>Profession</u> | | |
| Editorial Board: Philosophy & Theory of Biology | | 10/08- |
| Reviewer for NSF Proposals | | 11/06 & 10/08 |
| NEH Summer Stipend Panelist | | 10/92-12/92 |
| Reviewer for the following journals: | | |
| <i>British Journal for Philosophy of Science, Philosophy of Science, Studies in the History and Philosophy of Science, Astrobiology, Origins of Life and Evolution of the Biosphere, International Journal of Astrobiology, Journal of Philosophical Research, The Computer Journal, Dialogue, Minds and Machines, Synthese, Philosophy and Phenomenological Research</i> | | |

