"short" Curriculum Vita

William C. Wimsatt (rev. 12-14-2016)

Personal:

Born: May 27, 1941, Ithaca N. Y., Married: June 13, 1971, to Barbara Horberg. One child: William Samuel Abell Wimsatt, born November 18, 1972.

Addresses and Numbers:

residence: 5484 S. Everett, Chicago, Ill. 60615.
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Education:

1. Engineering physics, physics, 1959-62; philosophy, 1963-65; at Cornell University, A. B., 1965, *magna cum laude* in philosophy, and with distinction in general studies.
2. Designer, engineering department, NCR adding machine division, Sept. 1962-Aug. 1963.
3. Philosophy of Science, University of Pittsburgh, Sept. 1965- M.A., 1968, Ph.D., 1971.
4. Hinds Post-doctoral research fellow in population biology, (with Richard Lewontin and Richard Levins), July 1969-December 1970, University of Chicago.

Honors and Awards:

Woodrow Wilson Fellow, 1965-6, Mellon Fellow 1966-8, Woodrow Wilson Dissertation Fellow, 1969, Hinds postdoctoral fellow for Studies in Evolution (at Chicago), 1969-70, Research fellow in Humanities, Science and Technology, Cornell University, 1974-5. University Visiting Distinguished Professor, Ohio State University, 1983-4; Chicago Humanities Institute Senior Faculty Research Fellowship, 1996-7; Fellow, Bellagio Study and Conference Center, Rockefeller Foundation, March, 1997 "Clark-Way Harrison Distinguished Visitor", Washington University, (Philosophy, Neurophysiology, Psychology program), March-April, 2000, Visiting Hurst Professor, March 2010, National Humanities Center Fellowship, 2000-2001, Konrad Lorenz Institute for the Study of Evolution and Cognition, 2000- KLI Senior Fellow, July 2003, Franke Humanities Institute Fellow, 2004-5. research grants from the National Science Foundation (1977-9), (1981-2), (1987-8), (1988-9), (1997-9 (with Paul Humphreys)), System Development Foundation (1982-4), Hewlett-Packard (1982), American Council of Learned Societies (1985), Annenberg foundation grant to the BIOQUEST consortium for development of teaching software in biology, (1988-1990), 1992 EDUCOM Distinguished Natural Sciences Curriculum Innovation Award (Biology) for software presented as part of the BioQUEST package. (MODELBUILDING and BIOTA simulations.), Burlington-Northern Foundation award for Outstanding Graduate Teaching, 1993 (university-wide, 2 per year), Invited Plenary Address, "The Evolution of Generative Systems", The Piaget Society, Mexico City, June, 1999; Grants from Arthur Vining Davis Foundation for the Support of the Big Problems Curricular Initiative, 2003-2007, AAAS Fellow 2006- ; the David L. Hull Medal, awarded biennially by the International Society for History, Philosophy, and Social Studies of Biology for distinguished

scholarship and service, 2013 (first to a philosopher), Templeton Foundation grants for generic and genetic explanations in developmental biology (with Alan Love), 2015-2017, and Biological Practice as Foundation for a Scientific Metaphysics (with Alan Love, Ken Waters, Marcel Weber) 2015-2018. Norman MacLean Award for distinguished contributions to Teaching, U of C Alumni Association 2015.

Appointments: (University of Chicago, except as noted)

Assistant professor (January 1971-June, 1974). Associate professor (July, 1974-June, 1981). Full professor (July 1981-). Peter B. Ritzma professor, (2007- .) Appointments in department of philosophy, biology (collegiate division) and committee on conceptual foundations of science, 1971- ; committee on evolutionary biology, 1974- ; committee on general studies in humanities, 1975-95; Fishbein center for studies in history of science and medicine, 1977- ; Institute faculty, Council for Philosophical Studies Summer Institutes on "Biological and Social Perspectives on Human Nature" (Colorado, 1977) and "Teaching Philosophy of Biology" (Cornell, 1982.) retired (emeritus), July 2009, with continuing teaching and graduate commitments at Chicago; Winton Visiting Chair of Liberal Arts, Center for Philosophy of Science, University of Minnesota, 2010-2015.

I did graduate and undergraduate teaching in 3 out of 4 divisions at the university (humanities, biology, and social sciences), with appointments in the following academic units: Department of Philosophy (grad and undergrad), Biology Collegiate Division (undergrad), Committee on Conceptual Foundations of Science (grad), Program in History, Philosophy, and Social Studies of Science (undergrad), Committee on Evolutionary Biology (grad), M. A. Program in the Social Sciences (grad), Fishbein Center for History of Science and Medicine (research).

University Service (selected list):

Biology Collegiate Division governing committee, 1972-74, ASHUM governing committee, 1976-78, Secretary, Committee on Conceptual Foundations of Science, 1972-77, chairman, 1977-80, acting chmn, 1983-4, 1988-89, Board of Adult Education, 1977-80, 1985-88, President's Long Range Planning Committee, 1980-81, Benton Foundation fellowship committee, 1981-82, College Council 1985-88, Executive committee, 1985-1986, Steering committee for Humanities pilot project in Computing, 1984-88, Faculty oversight committee for the Humanities Computing Center, 1985- , Office of Special Programs Faculty Advisory Committee, 1985- . Physical Sciences Collegiate Division governing board, 1987-90, Task Force on Distributed Computing, 1988, Committee to Design the Humanities Institute, 1990, Board of Computing Activities and Services, 1991-1996, Biological Sciences Division Advisory Committee on Academic Computing, 1991-3. Council of the University Senate, 1992-1995, 2006-2009; (acting) Director of Graduate Studies, 1997-8, Divisional Policy Committee (elected) 1998-2001, Senior Fellow, The Society of Fellows 1998- 2005, Founder and Director, “Big Problems” Program, 1998-2010

Professional Service (selected list):

American Association for the Advancement of Science Electorate Nominating Committee, section L, 1975-77, chairman, 1977, program and nominating committees for the Philosophy of Science Association, program committee for the American Philosophical Association (Western Division), Chairman, local arrangements committee (1981) and member, governing

board for the Society for Philosophy and Psychology (1981-83), and the Philosophy of Science Association (1988-94), referee work for Academic Press, and Princeton, Chicago, Harvard, MIT, California, Minnesota, and Cornell University presses, NSF, NEH, Canada Council, CSIRO (Australian NSF), Rockefeller Foundation, American Naturalist, Bioscience, Evolutionary Theory, Journal for Theoretical Biology, Philosophy of Science, Paleobiology, Quarterly Review of Biology, Ecology, Biology and Philosophy, and Zygon. The Land Institute Scientific Advisory Board, 1996-. Board of Advisors, *The Leiter Philosophy Report 2002 - ,* Board of Editors: Foundations of Science 1999- , Journal of Cognition and Culture 2001-, Evolutionary Psychology (electronic) 2002-2007, Advisory Editor: *Biological Theory: Integrating Development, Evolution, and Cognition,* 2006- , Editorial Board, BioQUEST Educational Consortium, 2006-

Lectures and Seminars:

I have given over 430 invited lectures, seminars, and workshops at professional meetings, special institutes, and universities in the US, Canada, Mexico, Venezuela, Australia, China, England, Belgium, Holland, Italy, Spain, France, Israel, Turkey, Austria, and Germany to audiences of philosophers, historians, scientists, and computer users.

Students:

I have directed 41 dissertations in philosophy and conceptual foundations of science (Humanities Division thru 2007, then Social Sciences Division), 1 in Human Development (Social Sciences Division), and served as a reader on over 60 more dissertations in all 4 divisions, and for 4 dissertations at Minnesota. I have been an external examiner elsewhere 6 times, and supervisor for 3 post-doctoral researchers. I received the Burlington-Northern Foundation (university-wide) award for Outstanding Graduate Teaching in 1993 (1 of 2). I may possibly have played a role in training more philosophers of biology than anyone else in the country.

Research interests and orientations:

I am primarily interested in a cluster of problems arising in the analysis of the structure, behavior, and evolution of complex functionally organized systems. These include:

(1) Elaboration of my account of generative entrenchment and its role in evolution. This intersects closely with several of the other topics below—particularly 3, 4, 5, 9, 10. In the last 15 years this has broadened to an attempt to lay out the theoretical structure for an adequate account of cultural evolution using my work on generative entrenchment, and integration of the role of individual development in skill acquisition, and the coordinated development of institutions, organizations, and technology. Differences between biological and cultural evolution and their implications for theory.

(2) Materialist but non-reductionist accounts of biological organization, human nature, and the mind, and the analysis of aggregative and "emergent" behavior in complex systems, and the nature and consequences of levels of organization and perspectives as naturalistically explicable entities. This includes the role of functional organization (on which I have written widely), multiple realizability, material robustness and the role of mechanism.

(3) Heuristics, strategies and biases of problem solving, especially concerning the strengths and limitations of reductionist methodologies. The use of inferential and material robustness and entrenchment in managing partial and error-prone information about system organization. I have focused on the use of these heuristics in historical and current scientific contexts, as well as analogous heuristics of evolutionary design and their relations to principles of organization in biology and technology.

(4) The influence of social structure and work organization on cognitive processes and problem-solving, and the evolutionary origins of social and distributed cognition, and the role of social and cultural processes in evolution, particularly in the acquisition and development of complex skills.

(5) Relations between philosophy and science, basic and applied science, and the influence of engineering and experimental practice and values on theory. History of technology, and of scientific instrumentation.

(6) The role of visualization in problem solving, and their effective design and use (i.e., to make optimal use of design features of the visual system) for representing and understanding highly multi-dimensional data.

(7) Satisficing vs. maximization accounts of evolution, decision making, and human problem-solving behavior.

(8) Techniques and limitations of mathematical modeling in various areas in evolutionary and developmental biology, mathematical ecology, and the social sciences, and their influence on theory. (I have programmed and worked with simulations on programmable calculators and computers since 1975, introduced them to philosophers of biology in a summer workshop at Cornell in 1982, and was the first at Chicago to use simulations in an undergrad biology core course.)

(9) History of theories of heredity and of development, primarily from the late 18th century thru the 1920's, and particularly in the period 1868-1926.

(10) Using scientific diagrams as accessible indicators of the content of scientific theories which are readily copied and propagated (like cultural viruses). Diagrams can be used to track the evolution of scientific ideas (they are often the medium of their spread), what issues are most current at various times, and how attention to the content of the diagrams in learning the theories can bias its interpretation by later generations of scientists.

(11) Issues in evolutionary theory including: the units of selection controversy, the role of the phenotype and of development in evolution, the innate-acquired distinction, the use of reliability theory in modeling biological organization, and network models in analyzing the behavior and evolution of genetic control structures.

Selected bibliography: (• = not yet appeared)

BOOKS:

Wimsatt, W. C., and J. C. Schank, **1993;** ***Modelling--A Primer (or: the crafty art of making, exploring, extending, transforming, tweaking, bending, disassembling, questioning, and breaking models).*** 230 page text and lab manual to accompany BioQUEST software (by

Schank and Wimsatt, below) to teach model building and its critical analysis, showing that we can use false models to build better ones. (Includes original research material on model-building, visualization and the analysis of chaotic behavior, and its use to study the organization of computations through computational and display errors). Academic Press (on CD-ROM). Now Public domain through BioQUEST library of strategic simulations.*

Wimsatt, W. C., (Spring 2007) ***Re-Engineering Philosophy for Limited Beings: piecewise approximations to reality***. Harvard University Press. (472pp, 40% new material).

Due to be translated into and published in Portugese in 2009 (according to license from Harvard U. P.)

Soler, L., Trizio, E., Nickles, T. and Wimsatt, W., eds. (2012), ***Characterizing the Robustness of Science,*** Boston Studies in the Philosophy of Science, v. 292.

Caporael, L., Griesemer, J. and Wimsatt, W., eds. (2013), ***Scaffolding in Evolution, Culture, and Cognition***, KLI series in Theoretical Biology, MIT press.

W. C. Wimsatt and A. C. Love, eds. (2017) ***Beyond the Meme: the role of structure in theoretical accounts of cultural evolution*** (proceedings of a conference at Minnesota in Fall 2014), Minnesota Studies in the Philosophy of Science, University of Minnesota Press, about 400 pp.

SOFTWARE:

Schank, J. C., and W. C. Wimsatt, **1993**; *ModelBuilding 2.0,* Simulation software to run on the Macintosh family for teaching model building and its critical analysis. Part of the BioQUEST library of Strategic Simulations. (2 programs, compiled to 147K and 121 K)*

(listed as one of 7 authors (with William Sterner, of the Computer Science Department as lead author) for the BioQuest simulation package Biota, and its manual, though I played only an advisory role, with some input to the design. Part of the BioQUEST library of Strategic Simulations. (1 program compiled to 384K)*

PAPERS: (note: I haven't included reviews or commentaries except for 1971a and the last 5 years).

Wimsatt, W. C., **1971a;** "Self-Organization, Selection, and Dissipative Structures" (comments on a paper by Aharon Katchalsky), *Zygon*, **6**: 269-274. (AAAS symposium)

_____**1971b;** Some Problems with the Concept of Feedback, in R. C. Buck and R. S. Cohen, eds., *PSA-1970 (Boston Studies in the Philosophy of Science, volume 8)*, Dordrecht: Reidel, pp. 241-256;

_____**1972**; Teleology and the Logical Structure of Function Statements, *Studies in History and Philosophy of Science,* **3**: 1-80.

_____**1974**; Complexity and Organization, in K. F. Schaffner and R. S. Cohen, eds., *PSA-1972 (Boston Studies in the Philosophy of Science, volume 20)*, Dordrecht: Reidel, pp. 67-86.

_____**1976a**; Reductionism, Levels of Organization and the Mind-Body Problem, in G. Globus, I. Savodnik, and G. Maxwell, eds., *Consciousness and the Brain*, New York: Plenum, pp. 199-267.

_____**1976b**; Reductive Explanation: A Functional Account, in A. C. Michalos, C. A. Hooker, G. Pearce, and R. S. Cohen, eds., *PSA-1974 (Boston Studies in the Philosophy of Science, volume 30)* Dordrecht: Reidel, pp. 671-710.

_____**1979**; Reduction and Reductionism, invited review article in P. D. Asquith and H. Kyburg, Jr., eds., *Current Research in Philosophy of Science*, East Lansing, Michigan: The Philosophy of Science Association, pp. 352-377.

_____**1980a**; Randomness and perceived-randomness in evolutionary biology. *Synthese.* **43:** 287-329.

_____**1980b**; Reductionistic research strategies and their biases in the units of selection controversy. in T. Nickles. ed. *Scientific Discovery-vol.II: Case Studies.* Dordrecht: Reidel. pp. 213-259.

_____**1981a**; Robustness. reliability and overdetermination. in M. Brewer and B. Collins. eds. *Scientific Inquiry and the Social Sciences*. San Francisco: Jossey-Bass. pp. 124-163.

_____**1981b**; Units of selection and the structure of the multi-level genome. in P. D. Asquith and R. N. Giere. eds. *PSA-1980, volume 2.* Lansing. Michigan: The Philosophy of Science Association. pp. 122-183.

Glassmann, R. B., and _____, **1984**; Evolutionary Advantages and Limitations of Early Plasticity, in R. Almli and S. Finger, eds., *Early Brain Damage, volume I*, New York: Academic Press, pp. 35-58. In REvolution

_____, **1985a**; Heuristics and the Study of Human Behavior, in D. W. Fiske and R. Shweder, eds., *Metatheory in Social Science: Pluralisms and Subjectivities*, Chicago: University of Chicago Press, pp. 293-314.

_____**1985b**; Forms of aggregativity. in A. Donagan. N. Perovich. and M. Wedin. eds. *Human Nature and Natural Knowledge*. Dordrecht: Reidel. pp. 259-293.

_____**1986**; Developmental constraints, generative entrenchment, and the innate-acquired distinction, in P. W. Bechtel. ed. *Integrating Scientific Disciplines.* Dordrecht: Martinus-Nijhoff. pp. 185-208.

_____**1987**; False Models as means to Truer Theories, in M. Nitecki, and A. Hoffman, eds., *Neutral Models in Biology,* London: Oxford University Press, pp. 23-55.

Schank, J. C. and _____, **1988**; Generative Entrenchment and Evolution, in A. Fine and P. K. Machamer, eds., *PSA-1986, volume 2*. East Lansing: The Philosophy of Science Association, pp. 33-60.

_____, and J. C. Schank, **1988**; Two Constraints on the Evolution of Complex Adaptations and the Means for their Avoidance, in M. Nitecki, ed., *Evolutionary Progress*, Chicago: The University of Chicago Press, pp.231-273.

Griesemer, J. R., and _____, **1989**; Picturing Weismannism: A Case Study in Conceptual Evolution, in M. Ruse, ed., *What Philosophy of Biology Is*, (essays for David Hull) Martinus-Nijhoff, pp.75-137.

_____, **1991**; Taming the Dimensions–Visualizations in Science, in M. Forbes, L. Wessels, and A. Fine, eds, *PSA-1990, volume 2*; East Lansing: The Philosophy of Science Association, pp. 111-135.

_____**1992**; Golden Generalities and Co-opted Anomalies: Haldane vs. Muller and the Drosophila group on the Theory and Practice of Linkage Mapping, in S. Sarkar, ed., *The Founders of Evolutionary Genetics,* Dordrecht: Martinus-Nijhoff. pp. 107-166.

_____**1994a**; "The Ontology of Complex Systems: Levels, Perspectives and Causal Thickets", *Canadian Journal of Philosophy* supplementary volume #20, ed. Robert Ware and Mohan Matthen, pp. 207-274.

_____**1994b**; "Lewontin's evidence (that there isn't any!)", commentary on Richard Lewontin's "Facts and the Factitious in the Natural Sciences", in J. Chandler, A., Davidson, and H. Haroutunian, eds., *Questions of Evidence*, Chicago: University of Chicago Press pp.492-503.

_____**•1995** "The Analytic Geometry of Genetics: the Evolution of Punnett Squares", (62 pp. + 19 illustrations in ms.) [held back from publication to be a new essay in a collection of my work in history of genetics; but now (upon invitation) submitted to J. Hist. Biol]. *It is now expanded and revised to publish in 2 parts with part I appearing as 2006b.*

_____**1997a** "Functional Organization, Functional Analogy, and Functional Inference", *Evolution and Cognition*, v.3 (#2), pp. 2-32.

_____**1997b "**Aggregativity: Reductive Heuristics for Finding Emergence", in L. Darden, ed., PSA-1996, v. 2 [*Philosophy of Science*, Supp Vol. #2, 1997], pp. S372-S384.

_____, **1998b;** Simple Systems and Phylogenetic Diversity, *Philosophy of Science,* v.65 (2): July: 267-275.

_____,**1999a;** Genes, Memes, and Cultural Inheritance, invited contribution for April 1999 *Biology and Philosophy* special issue on influence of R. C. Lewontin. **14**: 279-310. Contains "In the Laboratory of a Natural Philosopher (Richard Lewontin)", 303-310.

_____, **1999b**; La emergencia como no agregatividad y los sesgos reduccionistas, in *Historia y explicacion en biologia*, Ana Baharona y Sergio Martinez, compiladores, Ediciones Cientificas Universitarias, Universidad Nacional Autonoma de Mexico, Mexico, D.F., Mexico, 385-415. [this paper is a translation of an ancestor to 1999f and 2000a2, and intermediate in length between them.] It has not appeared in English.

_____, **1999c**; Finalidad y intencionalidad en la naturaleza, in *Historia y explicacion en biologia*, Ana Baharona y Sergio Martinez, compiladores, Ediciones Cientificas Universitarias, Universidad Nacional Autonoma de Mexico, Mexico, D.F., Mexico, 478-494. [This paper is a translation of one written in 1968, but used the (widely accepted) notion of negative feedback, which I believed to be inadequately defined, but for which I did not then have a solution (Wimsatt 1971b) so I withheld publication. I now think it is OK, but have not yet published it in English.]

_____, **1999d;** Generativity, Entrenchment, Evolution, and Innateness, in V. Hardcastle, ed., *Biology meets Psychology: philosophical essays* MIT Press, 139-179.

_____,**2000a**; Emergence as Non-Aggregativity and the Biases of Reductionism(s), *Foundations of Science, **5***: 269-297.

Schank, J. C. and _____, **2000b**, Evolvability: Modularity and Generative Entrenchment", in R. Singh, C. Krimbas, D. Paul, and J. Beatty, eds*., Thinking About Evolution: Historical, Philosophical and Political Perspectives*, (Festschrift for Richard Lewontin, vol. 2), Cambridge U. P., 322-335.

Goldin-Meadow, S., M. McClintock, and _____, **•2000c;** (order alphabetical) "Heuristics for the Life and Human Sciences: Psychological Phenomena in Four Dimensions",[ms.45 pp.]

_____**2001a;** Richard Levins as Philosophical Revolutionary, *Biology and Philosophy, **16***: 103-108.

_____,**2001b**; Generative Entrenchment and the Developmental Systems Approach to Evolutionary Processes, in S. Oyama, R. Gray and P. Griffiths, eds, *Cycles of Contingency: Developmental Systems and Evolution,* Cambridge: MIT Press, 219-237.

_____,**2001c;** Heuristics ReFound: invited review of Gigerenzer. et.al., Simple Heuristics which Make You Smart, *Brain and Behavioral Sciences*, pp. ??

_____,**2002a** "Functional Organization, Functional Inference, and Functional Analogy", substantially revised and expanded version of 1997a for a collection on Function edited by Robert Cummins, Andre Ariew, and Mark Perlman, Oxford. pp. 174-221.

_____,**2002b** "False Models as means to Truer Theories: Blending Inheritance in Biological vs. Cultural Evolution", *Philosophy of Science* **69 (3)**: S12-S24.

_____,**2002c**, Review of Robert Aunger's The Electric Meme, *Natural History*, v., 111, #9, November, 68-72.

_____,**2003,** "Evolution, Entrenchment, and Innateness", ed. Terrance Brown and others, Proceedings of the 1999 Piaget Society Meetings, Lawrence Erlbaum and Assoc. 2003. pp.53-81.

_____, and J. C. Schank, **2004** "Generative Entrenchment, Modularity and Evolvability: When Genic Selection meets the Whole Organism", *in* G Schlosser and G. Wagner, eds., *Modularity in Evolution and Development,* University of Chicago Press, pp. 359-394.

Wimsatt, W. C., **2005**, Review of Wallace Arthur's Biased Embryos and Evolution, *Evolution and Development,* 7(4): 494-495.

Wimsatt, W. C., and S. Sarkar, **2006a**, Reductionism, entry for *Blackwell's Encyclopedia of Philosophy of Science*, vol 2, pp. 696-703.

Wimsatt, W. C. **(2006b).** Reductionism and Its Heuristics: Making Methodological Reductionism Honest, *Synthese* 151: 445-475.

Wimsatt, W. C. **(2006c).** Inconsistencies, Optimization and Satisficing—Steps towards a philosophy for limited beings: commentary on Russell Hardin, in C. Engel and L. Daston eds., *Is There Value in Inconsistency?* Common Goods: Law, Politics, Economics, v. 15, Baden-Baden, DE: Nomos Verlagsgesellschaft. pp. 201-220.

Wimsatt, W. C. **(2006d).** Optimization, Consistency, and Kluged Adaptations: can Maximization Survive? Comment on Kachalnik, et. al., in same volume, pp. 399-420.

Wimsatt, W. C. **(2006e).** Generative Entrenchment and an Evolutionary Developmental Biology for Culture, invited commentary on Mesoudi, Whiten and Laland, Towards a Unified Science of Cultural Evolution, *Brain and Behavioral Sciences*, 29: 364-366.

Interview: (2006f) "Bill Wimsatt on Multiple ways of Getting at the Complexity of Nature", by W. Bechtel, W. Callebaut, J. Griesemer, and J. Schank, *Biological Theory: Integrating Development, Evolution, and Cognition*, 1 (2): 213-219.

Wimsatt, W. C. (**2006g)**, Aggregate, Engineered, and Evolved Systems: Reductionistic Heuristics as means to More Holistic Theories, *Biology and Philosophy,* December 2006 issue; 21: 667-702.

Wimsatt W. C. **2006h**, Re-Engineering the Darwinian Sciences in Social Context,: invited commentary on Levins and Lewontin*, Biological Theory: Integrating Development, Evolution, and Cognition*, 1 (4) (December 2006) (10 pp. in ms.)

Wimsatt, W. C., (**2007a)**, Echoes of Haeckel? Re-entrenching Development in Evolution, in J. Maienschein and M. Laubichler, eds, *Evolution and Development*, MIT Press. pp. 309-355.

Wimsatt, W. C. (**2007b).** On Building Reliable Pictures with Unreliable Data: an Evolutionary and Developmental Coda for the New Systems Biology, in: *Systems Biology: Philosophical Foundations*, F. C. Boogerd, F. J. Bruggeman, J.-H. S. Hofmeyer, and H. V. Westerhoff, eds. Amsterdam, Reed-Elsevier. pp. 103-120.

Wimsatt, W. C., **2007c**, The Analytic Geometry of Genetics: Part I: The structure, function, and early evolution of Punnett squares, in Edna Suarez, Sergio Martinez and Ana Baharonha eds., *"Variedad Infinita: Ciencia y Representacion", UNAM/Limusa,* pp. 215-260. *In Spanish translation: to be republished in English*

Wimsatt, W. C., and J. R. Griesemer **2007d**, Reproducing Entrenchments to Scaffold Culture: The Central Role of Development in Cultural Evolution, in R. Sansome and R. Brandon, eds., *Integrating Evolution and Development: From Theory to Practice*, MIT Press pp. 228-323.

Wimsatt, W. C., (**2009a**) Memetics Does Not Provide a Useful Way of Understanding Cultural Evolution: A Developmental Perspective**,** (paired with Susan Blackmore arguing for memetics) for F. Ayala and R. Arp, eds, *Current Controversies in Philosophy of Biology*, Blackwell, pp. 273-291.

Wimsatt, W. C., (**2011**), Robust re-engineering: a philosophical account?, *Biology and Philosophy*, 26: 295-303.

Soler, L., Trizio, E., Nickles, T. and Wimsatt, W., eds. (2012b), *Characterizing the Robustness of Science***,** Boston Studies in the Philosophy of Science, v. 292, Springer.

reprint of "Robustness, Reliability, and Overdetermination" (Wimsatt 1981a) as Chapter 2 in the Soler. et al volume above, pp. 61-87. This article constituted a target article for the other articles in the volume.

Wimsatt, W. C. (2012a) Soler volume paper: (chapter 3) Robustness: Material and Inferential in the Natural and Human Sciences, pp. 89-104.

Wimsatt, W. C., (2012b), The Analytic Geometry of Genetics: The structure, function, and early evolution of Punnett squares, in *Archive for the History of the Exact Sciences*, *(inaugural biology issue)* forthcoming., (17,498 words + 10 figs.)

Wimsatt, W. C. (2012c), Robustness in a Variable Environment, group report (with Gluck, rapporteur, MacNamara, Brighton, Dayan, Kareev, Krause, Kurtzban, Selten, Stevens, Voelkl) In *Evolution and the Mechanisms of Decision Making*, ed. P. Hammerstein and J Stevens, Strungmann Forum Reports, MIT Press, pp. 195-214.

Wimsatt, W. C.,. (2013a), Evolution and the Stability of Functional Architectures, for CNRS conference on Function and Teleology, *Functions: Selection and Mechanisms,* ed. Philipe Huneman, Synthese library #363, Springer, pp. 19-41.

Wimsatt, W. C., (2013b), The Role of Generative Entrenchment and Robustness in the Evolution of Complexity, in *Complexity and the Arrow of Time,* ed., C. Lineweaver, P. Davies, and M. Ruse, Cambridge U. P., pp. 308-331.

Caporael, L., Griesemer, J. and Wimsatt, W., eds. (2013c), ***Scaffolding in Evolution, Culture, and Cognition***, KLI series in Theoretical Biology, MIT press.

Caporael, L., Griesemer, J. and Wimsatt, W., (2013d) KLI volume introduction (ca 5000 words).

Caporael, L., Griesemer, J. and Wimsatt, W., (2013e) KLI volume epilogue (ca 8000 words).

Wimsatt, W. C., (2013f), Scaffolding and Entrenchment, (ca. 12500 words + 1 table, 3 fig.), Chapter 3 of the above.

Wimsatt, W. C., (2013h), Articulating Babel: Linking Different Perspectives on Cultural Evolution, in a special issue on Integration in Contemporary Biological Sciences, edited by Ingo Brigandt in *Studies in History and Philosophy of Biological and Biomedical Sciences,* **44**: 563-571.

Wimsatt, W. C., (2015), Entrenchment as a Theoretical Tool in Evolutionary Developmental Biology, Chapter 18 in Love, A.C. (ed) *Conceptual Change in Biology: Scientific and Philosophical Perspectives on Evolution and Development*. Boston Studies in Philosophy of Science. Berlin: Springer, pp. 365-402.

Wimsatt, W. C. (2015), Modeling and Experiment: commentary on Weisberg, *Biology and Philosophy,* 30 (2): 293-298.

Wimsatt, W. C. (2016), Anthropomorphism and Science Fiction, for a special volume edited by Wendy O'Flaherty, Peter Galison, and Susan Nieman honoring the work of Lorraine Daston, Walter De Gruyter: Berlin, pp. 136-142..

In Press:

•Wimsatt, W. C. (2017a), Articulating Babel: Beyond the Meme, 13,000 words, Chapter 1 of ***Beyond the Meme, the importance of structure in accounts of cultural evolution***, Minnesota Studies in Philosophy of Science

•Wimsatt, W. C. and A. C. Love, eds. (2017c) ***Beyond the Meme, the importance of structure in accounts of cultural evolution***, Minnesota Studies in Philosophy of Science

•Wimsatt, W. C. and A. C. Love, (2017c), Introduction to the same volume.

Wimsatt, W. C. (2017d) Preface: the Chicago Origins of the New Mechanism, in S. M . Glennan and P. Iliari, eds., *Handbook of the New Mechaniam and the Mechanical Philosophy*, Routledge.

In Process:

•Wimsatt, W. C., Modeling as Structuring a Problem Space: The Drake Equation and the Probability of Alien Life.

•Wimsatt, W. C. (2017) The Role of Generative Entrenchment and Robustness in Understanding the Nature, Process, and Products of Scientific Change. (first written in 1991; to be revised to act as a stalking horse for the publication of a substantial book on generative entrenchment.)

•Wimsatt, W. C. (probably 2019) BOOK: *Why History Matters: generative entrenchment in the evolution of complex structures*, in process

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* The BioQUEST package got the National 1992 Educom Distinguished Curricular Innovation Award for the Natural Sciences in 1992.

Items 1971b, 1972, 1974, 1976b, 1980a, 1980b, 1981a, 1981b, 1985a, 1996, 1997a, and 1997b have been reprinted by others from one to three times. Some others have been reported to me, including some in Spanish and Chinese, but I haven't kept track. Book 2007 has been translated into Portuguese.