

Bibliography

- Ankeny, R. A. (2000), "Fashioning descriptive models in biology: of worms and wiring diagrams." *Philosophy of Science*, 67, pp. 260–272, DOI: 10.1086/392824.
- Ankeny, R. A. & Leonelli, S. (2011), "What's so special about model organisms?" *Studies in History and Philosophy of Science*, 42 (2), pp. 313–323, DOI: 10.1016/j.shpsa.2010.11.039.
- Annas, J. (1981), *An Introduction to Plato's Republic*. Oxford, Clarendon Press.
- Apel, K.-O. (1982), "The Erklären-Verstehen controversy in the philosophy of the natural and human sciences." In Fløistad G. (ed.), *La philosophie contemporaine / Contemporary philosophy*, International Institute of Philosophy / Institut International de Philosophie, vol 2, pp. 19–49, Dordrecht, Springer, DOI: 10.1007/978-94-010-9940-0_2.
- Bailer-Jones, D. (1997), *Scientific Models. A Cognitive Approach with an Application in Astrophysics*, Ph.D. Thesis, University of Cambridge.
- Barrow, J. D. (2001), "Cosmology, Life, and the Anthropic Principle". *Annals of the New York Academy of Sciences*, 950 (1), pp. 139–153, DOI: 10.1111/j.1749-6632.2001.tb02133.x.
- Baumberger, C. (2011), "Types of Understanding: Their Nature and Their Relation to Knowledge." *Conceptus*, 40, pp. 67–88, DOI: 10.1515/cpt-2014-0002.
- Baumberger, C., Beisbart, C. & Brun, G. (2017), "What is Understanding? An Overview of Recent Debates in Epistemology and Philosophy of Science." In Grimm, S., Baumberger, C. & Ammon, S. (eds.), *Explaining Understanding. New Perspectives from Epistemology and Philosophy of Science*, pp. 1–34, New York and London, Routledge.
- Baumberger, C. & Brun, G. (2017), "Dimensions of Objectual Understanding." In Grimm S., Baumberger, C. & Ammon, S. (eds.), *Explaining Understanding. New Perspectives from Epistemology and Philosophy of Science*, pp. 165–189, New York and London, Routledge.
- Bechtel, W. & Abrahamsen, A. (2005), "Explanation: a mechanist alternative." *Studies in History and Philosophy of Biological and Biomedical Sciences*, 36, pp. 421–441, DOI: 10.1016/j.shpsc.2005.03.010.

- Beiser, F. C. (2011), *The German Historicist Tradition*. New York, Oxford University Press, DOI: 10.1093/acprof:oso/9780199691555.001.0001.
- Benzer, S. (1968), "Genes and behavior." *Engineering and Science*, 32, pp. 50–52.
- Bisgrove, B. W., Essner, J. J. & Yost, H. J. (1999), "Regulation of midline development by antagonism of lefty and nodal signaling." *Development*, 126 (14), pp. 3253–3262, DOI: 10.1242/dev.126.14.3253.
- Bohr, N. (1913), "On the Constitution of Atoms and Molecules, Part I". *Philosophical Magazine*, 26 (151), pp. 1–24.
- Boyd, K. (2019), "Group understanding." *Synthese*, 198 (7), pp. 6837–6858, DOI: 10.1007/s11229-019-02492-3.
- Braillard, P.-A. & Malaterre, C. (2015), *Explanation in Biology. An Enquiry into the Diversity of Explanatory Patterns in the Life Sciences*. In History, Philosophy and Theory of the Life Sciences, Dordrecht, Springer, DOI: 10.1007/978-94-017-9822-8.
- Brainard, L. (2020), "How to Explain How-Possibly." *Philosophers Imprint*, 20 (13), pp. 1–23.
- Brenner, S. (1974), "The genetics of *Caenorhabditis elegans*." *Genetics*, 77 (1), pp. 71–94, DOI: 10.1093/genetics/77.1.71.
- Brenner, S. (1998), "Letter to Perutz." In Wood, W. B. (ed.), *The nematode *Caenorhabditis elegans**, pp. x–xi, Cold Spring Harbor (NY), Cold Spring Harbor Laboratory Press.
- Brown, R. J., (1986), "Thought Experiments since the scientific revolution." *International Studies in the Philosophy of Science*, 1(1), pp. 1–15, DOI: 10.1080/02698598608573279.
- Brown, J. R. (1991), *The Laboratory of the Mind – Thought Experiments in the Natural Sciences*. New York and London, Routledge.
- Cairns, J., Stent, G. S. & Watson, J. D. (eds.) (1966), *Phage and the origins of molecular biology*. Cold Spring Harbor (NY), Cold Spring Harbor Laboratory Press.
- Carter, J. & Gordon, E. (2014), "Objectual Understanding and the Value Problem." *American Philosophical Quarterly*, 51 (1), pp. 1–13.
- Chang, H. (2004), *Inventing Temperature. Measurement and Scientific Progress*, New York, Oxford University Press, DOI: 10.1093/0195171276.001.0001.
- Chang, H. (2012), *Is Water H₂O? Evidence, Realism and Pluralism*, Dordrecht, Springer, DOI: 10.1007/978-94-007-3932-1.
- Chang, H. (2012), "Beyond Case-Studies: History as Philosophy." In Schmaltz, T. & Mauskopf, S. (eds.) *Integrating History and Philosophy of Science: Problems and Prospects*, (pp. 109–124). Dordrecht, Springer, DOI: 10.1007/978-94-007-1745-9_8.
- Chirimuuta, M. (2021), "Prediction versus understanding in computationally enhanced neuroscience." *Synthese*, 199 (1), pp. 767–790, DOI: 10.1007/s11229-020-02713-0.
- Choi, S. & Fara, M., "Dispositions", *The Stanford Encyclopedia of Philosophy* (Spring 2021 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/spr2021/entries/dispositions/> (last accessed April 12th, 2022).

- Collins, H. (2010), *Tacit and Explicit Knowledge*. Chicago and London, The University of Chicago Press.
- Conee, E. & Feldman, R. (2004), *Evidentialism: Essays in Epistemology*. Oxford, Oxford University Press, DOI: 10.1093/0199253722.001.0001.
- Contessa, G. (2007), "Scientific Representation, Interpretation, and Surrogate Reasoning", *Philosophy of Science*, 74 (1), pp. 48–68, DOI: 10.1086/519478.
- Creaser, C. W. (1934), "The technic of handling the zebra fish (*Brachydanio rerio*) for the production of eggs which are favorable for embryological research and are available at any specified time throughout the year." *Copeia*, 4, pp. 159–161, DOI: 10.2307/1435845.
- Darden, L., (2008), "Thinking Again about Biological Mechanisms." *Philosophy of Science*, 75 (5), pp. 958–969, DOI: 10.1086/594538.
- De Campos-Baptista, M. I., Holtzman, N. G., Yelon, D. & Schier, A. F. (2008), "Nodal signaling promotes the speed and directional movement of cardiomyocytes in zebrafish." *Developmental Dynamics: An Official Publication of the American Association of Anatomists*, 237 (12), pp. 3624–3633, DOI: 10.1002/dvdy.21777.
- De Regt, H. W. (2004), "Discussion Note: Making Sense of Understanding." *Philosophy of Science*, 71 (1), pp. 98–109, DOI: 10.1086/381415.
- De Regt, H. W. (2017), *Understanding Scientific Understanding*. New York, Oxford University Press, DOI: 10.1093/oso/9780190652913.001.0001.
- De Regt, H. W. & Gijsbers, V. (2017), "How False Theories Can Yield Genuine Understanding." In Grimm, S., Baumberger, C. & Ammon, S. (eds.), *Explaining Understanding. New Perspectives from Epistemology and Philosophy of Science*, pp. 50–75, New York and London, Routledge.
- De Regt, H. W. and Höhl, Anna E. (2020), Review of Khalifa, K., *Understanding, Explanation and Scientific Knowledge*, BJPS Review of Books, <https://www.thebsp.org/reviewofbooks/kareem-khalifa-understanding-explanation-and-scientific-knowledge-reviewed-by-de-regt-hohl/> (last accessed April 14th, 2022).
- De Vreese, L., Weber, E. & Van Bouwel, J. (2010), "Explanatory pluralism in the medical sciences: Theory and practice." *Theor Med Bioeth*, 31, pp. 371–390, DOI: 10.1007/s11017-010-9156-7.
- Dellsén, F. (2020), "Beyond Explanation: Understanding as Dependency Modelling." *British Journal for the Philosophy of Science*, 71, pp. 1261–1286, DOI: 10.1093/bjps/axy058.
- Douglas, H. E. (2004), "The Irreducible Complexity of Objectivity." *Synthese*, 138, pp. 453–473, DOI: 10.1023/B:SYNT.0000016451.18182.91.
- Driever, W. & Nüsslein-Volhard, C. (1989), "The bicoid protein is a positive regulator of hunchback transcription in the early *Drosophila* embryo." *Nature*, 337 (6203), pp. 138–143, DOI: 10.1038/337138a0.
- Elgin, C. Z. (1991), "Understanding: Art and Science." *Midwest Studies in Philosophy*, 16, pp. 196–208, DOI: 10.1111/j.1475-4975.1991.tb00239.x.

- Elgin, C. Z. (2007), "Understanding and the Facts." *Philosophical Studies*, 132, pp. 33–42, DOI: 10.1007/s11098-006-9054-z.
- Elgin, C. Z. (2017), *True Enough*. Cambridge (MA) and London, MIT Press.
- Endersby, J. (2007), *A guinea pig's history of biology*. London, William Heinemann Ltd.
- Fantini, B. (2000), "Molecularizing embryology: Alberto Monroy and the origins of developmental biology in Italy." *The International Journal of Developmental Biology*, 44 (6), pp. 537–553.
- Feynman, R. P. (2006 [1985]), *QED: The Strange Theory of Light and Matter*. Princeton, Princeton University Press.
- Feynman, R. P. (2017 [1965]), *The Character of Physical Law*. Cambridge (MA), MIT Press.
- Findl, J. & Suárez, J. (2021), "Descriptive understanding and prediction in COVID-19 modelling." *History and Philosophy of the Life Sciences*, 43 (4), pp. 1–31, DOI: 10.1007/s40656-021-00461-z.
- Fridland, E. & Pavese, C. (eds.) (2021), *The Routledge Handbook of Philosophy of Skills and Expertise*. Routledge.
- Friedman, M. (1974), "Explanation and Scientific Understanding." *Journal of Philosophy*, 71 (1), pp. 5–19, DOI: 10.2307/2024924.
- Frigg, R. & Nguyen, J. (2016), "The Fiction View of Models Reloaded." *The Monist*, 99, pp. 225–242, DOI: 10.1093/monist/onw002.
- Frigg, R. & Nguyen, J., "Scientific Representation", *The Stanford Encyclopedia of Philosophy* (Spring 2020 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/spr2020/entries/scientific-representation/> (last accessed April 12th, 2022).
- Galileo Galilei (1954 [1914, 1638]), *Dialogues concerning two new sciences*. Trans. Crew, H. & de Salvio, A., New York, Dover Publications.
- Giere, R. N. (1999), *Science without Laws*. Chicago, University of Chicago Press.
- Giere, R. N. (2004), "How models are used to represent reality." *Philosophy of Science*, 71, pp. 742–752, DOI: 10.1086/425063.
- Giere, R. N. (2006), *Scientific Perspectivism*. Chicago, University of Chicago Press.
- Gijsbers, V. (2013), "Understanding, explanation, and unification." *Studies in the History and Philosophy of Science*, 44, pp. 516–522, DOI: 10.1016/j.shpsa.2012.12.003.
- Glymour, B. (2007), "In defence of explanatory deductivism." In Campbell, J. K., O'Rourke, M. & Silverstein, H. (eds.), *Causation and explanation*, pp. 133–154, Cambridge (MA), MIT Press.
- Greco, J. (2007), "The Nature of Ability and the Purpose of Knowledge." *Philosophical Issues*, 17, pp. 57–69, DOI: 10.1111/j.1533-6077.2007.00122.x.
- Greco, J. (2010), *Achieving Knowledge. A virtue-theoretic account of epistemic normativity*, Cambridge, Cambridge University Press, DOI: 10.1017/CBO9780511844645.

- Greco, J. (2014), "Episteme: Knowledge and Understanding." In Timpe, K. & Boyd, C. A. (eds.), *Virtues and Their Vices*, pp. 285–302, Oxford, Oxford University Press, DOI: 10.1093/acprof:oso/9780199645541.003.0014.
- Greene, B. (2008), "Put a Little Science in Your Life." *New York Times*, Open Ed., June 1, <https://www.nytimes.com/2008/06/01/opinion/01greene.html> (last accessed October 3rd, 2023).
- Grimm, S. (2014), "Understanding as Knowledge of Causes." In Fairweather, A. (ed.), *Virtue Epistemology Naturalized: Bridges between Virtue Epistemology and Philosophy of Science*, pp. 347–360, Dordrecht, Springer, DOI: 10.1007/978-3-319-04672-3_19.
- Grimm, S. (2017), "Understanding and Transparency." In Grimm, S., Baumberger C. & Ammon, S. (eds.), *Explaining Understanding. New Perspectives from Epistemology and Philosophy of Science*, pp. 212–229, New York and London, Routledge.
- Grimm, S., "Understanding", *The Stanford Encyclopedia of Philosophy* (Summer 2021 Edition), Edward N. Zalta (ed.), forthcoming URL = <https://plato.stanford.edu/archives/sum2021/entries/understanding/> (last accessed April 11th, 2022).
- Gritsman, K., Zhang, J., Cheng, S., Heckscher, E., Talbot, W. S. & Schier, A. F. (1999), "The EGF CFC protein one-eyed pinhead is essential for nodal signaling." *Cell*, 97 (1), pp. 121–132, DOI: 10.1016/S0092-8674(00)80720-5.
- Grunwald, D. J., Kimmel, C. B., Westerfield, M., Walker, C. & Streisinger, G. (1988), "A neural degeneration mutation that spares primary neurons in the zebrafish." *Developmental Biology*, 126 (1), pp. 115–128, DOI: 10.1016/0012-1606(88)90245-x.
- Hempel, C. G. (1965), *Aspects of Scientific Explanation and Other Essays in the Philosophy of Science*. New York, Free Press.
- Hitchcock, C. R. (1999), "Contrastive explanation and the demons of determinism." *British Journal for the Philosophy of Science*, 50 (4), pp. 585–612, DOI: 10.1093/bjps/50.4.585.
- Hughes, R. I.G. (1997), "Models and Representation", *Philosophy of Science*, 64, pp. 325–336, DOI: 10.1086/392611.
- Humphreys, P. (2000), "Analytic Versus Synthetic Understanding." In Fetzer, J. (ed.), *Science, Explanation, and Rationality: The Philosophy of Carl G. Hempel*, pp. 267–286, Oxford, Oxford University Press, DOI: 10.1093/oso/9780199334872.003.0017.
- Ingham, P. W. (1997), "Zebrafish genetics and its implications for understanding vertebrate development." *Human Molecular Genetics*, 6 (10), pp. 1755–1760, DOI: 10.1093/hmg/6.10.1755.
- Khalifa, K. (2013), "Is understanding explanatory or objectual?" *Synthese*, 190, pp. 1153–1171, DOI: 10.1007/s11229-011-9886-8.
- Khalifa, K. (2017a), "Must Understanding be Coherent?" In Grimm, S., Baumberger, C. & Ammon, S. (eds.), *Explaining Understanding. New Perspectives from Epistemology and Philosophy of Science*, pp. 139–164, New York and London, Routledge.
- Khalifa, K. (2017b), *Understanding, Explanation, and Scientific Knowledge*. Cambridge, Cambridge University Press, DOI: 10.1017/9781108164276.

- Kim, J. (1974), "Noncausal Connections." *Noûs*, 8, pp. 41–52, DOI: 10.2307/2214644.
- Kim, J. (1994 [2010]), "Explanatory Knowledge and Metaphysical Dependence." *Philosophical Issues*, 5, pp. 51–69, Reprinted in Kim, J. (2010), *Essays in the Metaphysics of Mind*. New York, Oxford University Press, DOI: 10.1093/acprof:oso/9780199585878.001.0001.
- Kimmel, C. B., Warga, R. M. & Schilling, T. F. (1990) "Origin and organization of the zebrafish fate map." *Development*, 108 (4), pp. 581–594, DOI: 10.1242/dev.108.4.581.
- Kimmel, C. B., Ballard, W. W., Kimmel, S. R., Ullmann, B. & Schilling, T. F. (1995), "Stages of embryonic development of the zebrafish." *Developmental Dynamics: An Official Publication of the American Association of Anatomists*, 203 (3), pp. 253–310, DOI: 10.1002/aja.1002030302.
- Kitcher, P. & Salmon, W. C. (1987), "Van Fraassen on explanation." *Journal of Philosophy*, 84 (6), pp. 315–330, DOI: 10.2307/2026782.
- Kitcher, P. (1989), "Explanatory Unification and the Causal Structure of the World." In Kitcher, P. & Salmon, W. (eds.), *Scientific Explanation*, Minnesota Studies in the Philosophy of Science, Vol. 13, pp. 410–505, Minneapolis (MN), University of Minnesota Press.
- Knorr-Cetina, K. (1999), *Epistemic Cultures: How the Sciences Make Knowledge*. Cambridge (MA), Harvard University Press, DOI: 10.4159/9780674039681.
- Kragh, H. (2003), "Magic Number: A Partial History of the Fine-Structure Constant." *Archive for History of Exact Sciences*, 57 (5), pp. 395–431, DOI: 10.1007/s00407-002-0065-7.
- Kuhn, T. S. (2012 [1970]), *The structure of scientific revolutions* (4. ed., 50th anniversary ed.). Chicago, University of Chicago Press.
- Kühne, U. (1997), "Gedankenexperiment und Erklärung." *Bremer Philosophica*, 5, pp. 1–51.
- Kvanvig, J. L. (2003), *The Value of Knowledge and the Pursuit of Understanding*. New York, Cambridge University Press, DOI: 10.1017/CBO9780511498909.
- Kvanvig, J. L. (2009), "The value of understanding." In Haddock, A., Miller, A. & Pritchard, D. (eds.), *Epistemic value*, pp. 95–111, Oxford, Oxford University Press, DOI: 10.1093/acprof:oso/9780199231188.001.0001.
- Laale, H. W. (1977), "The biology and use of zebrafish, *Brachydanio rerio* in fisheries research. A literature review." *Journal of Fish Biology*, 10, pp. 121–173, DOI: 10.1111/j.1095-8649.1977.tb04049.x.
- Lear, J. (1988), *Aristotle: The Desire to Understand*. New York, Cambridge University Press, DOI: 10.1017/CBO9780511570612.002.
- Leonelli, S. (2009), "Understanding in Biology: The Impure Nature of Biological Knowledge." In de Regt, H. W., Leonelli, S. & Eigner, K. (eds.), *Understanding: Philosophical Perspectives*, pp. 189–209, Pittsburgh, University of Pittsburgh Press.

- Lipton, P. (2009), "Understanding without explanation." In de Regt, H. W., Leonelli, S. & Eigner, K. (eds.), *Scientific Understanding: Philosophical Perspectives*, pp. 43–63, Pittsburgh, University of Pittsburgh Press.
- Longino, H. E. (1990), *Science as Social Knowledge: Values and Objectivity in Scientific Inquiry*. Princeton (NJ), Princeton University Press.
- MacBride, F., "Relations", *The Stanford Encyclopedia of Philosophy* (Winter 2020 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/win2020/entries/relations/> (last accessed April 14th, 2022).
- Machamer, P., Darden, L. & Craver, C. F. (2000), "Thinking about Mechanisms." *Philosophy of Science*, 67 (1), pp. 1–25, DOI: 10.1086/392759.
- Maier, J., "Abilities", *The Stanford Encyclopedia of Philosophy* (Summer 2021 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/sum2021/entries/abilities/> (last accessed April 12th, 2022).
- Makkreel, R., "Wilhelm Dilthey", *The Stanford Encyclopedia of Philosophy* (Spring 2021 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/spr2021/entries/dilthey/> (last accessed April 11th, 2022).
- Mantzavinos, C. (2016), *Explanatory Pluralism*. Cambridge, Cambridge University Press, DOI: 10.1017/CBO9781316440599.
- Meinefeld, W. (1995), *Realität und Konstruktion. Erkenntnistheoretische Grundlagen einer Methodologie der empirischen Sozialforschung*, Wiesbaden, VS Verlag für Sozialwissenschaften, DOI: 10.1007/978-3-663-11243-3.
- Meunier, R. (2012), "Stages in the development of a model organism as a platform for mechanistic models in developmental biology: Zebrafish, 1970–2000." *Studies in History and Philosophy of Biological and Biomedical Sciences*, 43, pp. 522–531, DOI: 10.1016/j.shpsc.2011.11.013.
- Mullins, M. C., Hammerschmidt, M., Haffter, P. & Nüsslein-Volhard, C. (1994), "Large-scale mutagenesis in the zebrafish: in search of genes controlling development in a vertebrate." *Current Biology*, 4 (3), pp. 189–202, DOI: 10.1016/S0960-9822(00)00048-8.
- Newman, M. (2017), "An Evidentialist Account of Explanatory Understanding." In Grimm, S., Baumberger, C. & Ammon, S. (eds.), *Explaining Understanding. New Perspectives from Epistemology and Philosophy of Science*, pp. 190–211, New York and London, Routledge.
- Nüsslein-Volhard, C. & Wieschaus, E. (1980), "Mutations affecting segment number and polarity in *Drosophila*." *Nature*, 287 (5785), pp. 795–801, DOI: 10.1038/287795a0.
- Oberheim, E. & Hoyningen-Huene, P., "The Incommensurability of Scientific Theories", *The Stanford Encyclopedia of Philosophy* (Fall 2018 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/fall2018/entries/incommensurability/> (last accessed April 16th, 2022)

- Olsson, E., "Coherentist Theories of Epistemic Justification", *The Stanford Encyclopedia of Philosophy* (Fall 2021 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/fall2021/entries/justep-coherence/> (last accessed April 11th, 2022).
- Pappas, G., "Internalist vs. Externalist Conceptions of Epistemic Justification", *The Stanford Encyclopedia of Philosophy* (Fall 2017 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/fall2017/entries/justep-intext/> (last accessed April 11th, 2022).
- Pasnau, R. (2017), *After Certainty: A History of Our Epistemic Ideals and Illusions*. New York, Oxford University Press, DOI: 10.1093/oso/9780198801788.001.0001.
- Pavese, C., "Knowledge How", *The Stanford Encyclopedia of Philosophy* (Summer 2021 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/sum2021/entries/knowledge-how/> (last accessed April 12th, 2022).
- Polanyi, M. (1962 [1958]), *Personal Knowledge. Towards a Post-Critical Philosophy*, London, Routledge.
- Potochnik, A. (2017), *Idealization and the Aims of Science*, Chicago (IL), University of Chicago Press, DOI: 10.7208/9780226507194.
- Pritchard, D., Millar, A. & Haddock, A. (2010), *The Nature and Value of Knowledge: Three Investigations*, Oxford, Oxford University Press, DOI: 10.1093/acprof:oso/9780199586264.001.0001.
- Pritchard, D. (2010), "Knowledge and Understanding." In Pritchard, D., Millar, A. & Haddock, A., *The Nature and Value of Knowledge: Three Investigations*, (pp. 3–90), New York, Oxford University Press, DOI: 10.1093/acprof:oso/9780199586264.001.0001.
- Railton, P. (1978), "A Deductive-Nomological Model of Probabilistic Explanation." *Philosophy of Science*, 45 (2), pp. 206–226, DOI: 10.1086/288797.
- Reese, H. W. (1999), "Explanation Is Not Description." *Behavioral Development Bulletin*, 8 (1), pp. 3–7, DOI: 10.1037/ho100524.
- Reutlinger, A., Hangleiter, D. & Hartmann, S. (2018). „Understanding (with) Toy Models." *British Journal for the Philosophy of Science*, 69 (4), pp. 1069–1099, DOI: 10.1093/bjps/axx005.
- Reutlinger, A., & Saatsi, J. (2018). *Explanation beyond causation: philosophical perspectives on noncausal explanations*. Oxford, Oxford University Press, DOI: 10.1093/oso/9780198777946.001.0001.
- Reydon, T. (2012), "How-possibly explanations as genuine explanations and helpful heuristics: A comment on Forber." *Studies in History and Philosophy of Biological and Biomedical Sciences*, 43 (1), pp. 302–310, DOI: 10.1016/j.shpsc.2011.10.015.
- Rheinberger, H.-J. (1997), *Toward a history of epistemic things. Synthesizing proteins in the test tube*, Stanford (CA), Stanford University Press.

- Ribeiro, R. & Collins, H. (2007), "The Bread- Making Machine, Tacit Knowledge, and Two Types of Action." *Organization Studies*, 28 (9), pp. 1417–1433, DOI: 10.1177/0170840607082228.
- Rice, C. & Rohwer, Y. (2021), "How to Reconcile a Unified Account of Explanation with Explanatory Diversity." *Found Sci*, 26, pp. 1025–1047, DOI: 10.1007/s10699-019-09647-y.
- Robertson, D. S. (1996), "Niels Bohr – Through Hydrogen Towards the Nature of Matter." In Lakhtakia, A. (ed.), *Models and Modelers of Hydrogen*, pp. 49–82, Singapore, World Scientific Publishing.
- Rudin, C., et al. (2021). "Interpretable machine learning: Fundamental principles and 10 grand challenges." *Statistics Surveys*, 16, pp. 1–85, DOI: 10.1214/21-SS133.
- Ryle, G. (1949), *The Concept of Mind*. Chicago, The University of Chicago Press.
- Ryle, G. (1990 [1946]), "Knowing How and Knowing That." In *Collected Papers* (Volume 2), Bristol, Thoemmes Antiquarian Books Ltd, pp. 212–225.
- Sakaguchi, K. et. al. (2019), "Comprehensive Experimental System for a Promising Model Organism Candidate for Marine Teleosts." *Scientific Reports*, 9 (4948), DOI : 10.1038/s41598-019-41468-8.
- Schier, A. F., Neuhauss, S. C., Helde, K. A., Talbot, W. S. & Driever, W. (1997), "The one-eyed pinhead gene functions in mesoderm and endoderm formation in zebrafish and interacts with no tail." *Development*, 124 (2), pp. 327–342, DOI: 10.1242/dev.124.2.327.
- Schmaltz, T. & Mauskopf, S. (eds.) (2012), *Integrating History and Philosophy of Science: Problems and Prospects*. Dordrecht, Springer, DOI: 10.1007/978-94-007-1745-9.
- Soler, L., Zwart, S., Lynch, M. & Israël-Jost, V. (eds.) (2014), *Science After the Practice Turn in the Philosophy, History, and Social Studies of Science*. Studies in the Philosophy of Science 14, New York and London, Routledge.
- Sosa, E. (2010), "How competence matters in epistemology." *Philosophical Perspectives*, 24, pp. 465–475, DOI: 10.1111/j.1520-8583.2010.00200.x.
- Stahl, F. W. (1995), "George Streisinger—December 27, 1927—September 5, 1984." *Biographical Memoirs. National Academy of Sciences (U.S.)*, 68, pp. 353–361.
- Streisinger, G., Walker, C., Dower, N., Knauber, D. & Singer, F. (1981), "Production of clones of homozygous diploid zebra fish (*Brachydanio rerio*)." *Nature*, 291 (5813), pp. 293–296, DOI: 10.1038/291293a0.
- Strevens, M. (2008), *Depth*. Cambridge (MA) and London, Harvard University Press.
- Strevens, M. (2013), "No Understanding without Explanation", *Studies in History and Philosophy of Science A*, 44 (3), pp. 510–515, DOI: 10.1016/j.shpsa.2012.12.005.
- Strevens, M. (2017), "How Idealizations Provide Understanding." In Grimm, S., Baumberger, C. & Ammon, S. (eds.), *Explaining Understanding. New Perspectives from Epistemology and Philosophy of Science*, pp. 37–49, New York and London, Routledge.

- Sullivan, E. (2022), "Understanding from machine learning models." *The British Journal for the Philosophy of Science*, 73(1), pp. 109–133, DOI: 10.1093/bjps/axzo35.
- Trout, J. D. (2002), "Scientific Explanation And The Sense Of Understanding." *Philosophy of Science*, 69 (2), pp. 212–233, DOI: 10.1086/341050.
- Turri, J., Alfano, M. & Greco, J., "Virtue Epistemology", *The Stanford Encyclopedia of Philosophy* (Winter 2021 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/win2021/entries/epistemology-virtue/> (last accessed April 12th 2022).
- Uebel, T. (2010), "Opposition to *Verstehen* in Orthodox Logical Empiricism." In Feest, U. (ed.), *Historical Perspectives on Erklären and Verstehen*, pp. 291–309, Dordrecht, Springer, DOI: 10.1007/978-90-481-3540-0_15.
- Van Fraassen, B. C. (1980), *The Scientific Image*. Oxford, Clarendon Press, DOI:10.1093/0198244274.001.0001.
- Várlaki, P., Náday, L., Bokor, J. (2008), "Number archetypes and 'background' control theory concerning the fine structure constant". *Acta Polytechnica Hungarica*, 5 (2), pp. 71–104.
- Varzi, A., "Mereology", *The Stanford Encyclopedia of Philosophy* (Spring 2019 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/spr2019/entries/mereology/> (last accessed April 14th, 2022).
- Vetter, B. (2019), "Are abilities dispositions?" *Synthese*, 196, pp. 201–220, DOI: 10.1007/s11229-016-1152-7.
- Weber, E., de Regt, H. W. & van Eck, D. (2021), "Investigating the Unity and Disunity of Scientific Explanation." *Found Sci*, 26, pp. 1021–1024, DOI: 10.1007/s10699-020-09704-x.
- Weisberg, M. (2013), *Simulation and Similarity. Using models to understand the world*, Oxford, Oxford University Press, DOI: 10.1093/acprof:oso/9780199933662.001.0001.
- Whittaker, E. (1945), "Eddington's Theory of the Constants of Nature." *The Mathematical Gazette*, 29 (286), pp. 137–144, DOI: 10.2307/3609461.
- Wilkenfeld, D. A. (2013), "Understanding as Representation Manipulability." *Synthese*, 190 (6), pp. 997–1016, DOI: 10.1007/s11229-011-0055-x.
- Winther, R. G., "The Structure of Scientific Theories", *The Stanford Encyclopedia of Philosophy* (Spring 2021 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/spr2021/entries/structure-scientific-theories/> (last accessed April 14th, 2022).
- Woodward, J. (2003), *Making things happen: a theory of causal explanation*. New York, Oxford University Press, DOI: 10.1093/0195155270.001.0001.
- Woodward, J. & Ross, L., "Scientific Explanation", *The Stanford Encyclopedia of Philosophy* (Summer 2021 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/sum2021/entries/scientific-explanation/> (last accessed April 12th, 2022).

- Wright, C. & van Eck, D. (2018), "Ontic Explanation Is either Ontic or Explanatory, but Not Both." *Ergo: An Open Access Journal of Philosophy*, 5, pp. 997–1029, DOI: 10.3998/ergo.12405314.0005.038.
- Zagzebski, L. (1996), *Virtues of the Mind. An Inquiry into the Nature of Virtue and the Ethical Foundations of Knowledge*, New York, Cambridge University Press, DOI: 10.1017/CBO9781139174763.
- Zagzebski, L. (2001), "Recovering Understanding." In Steup, M. (ed.), *Knowledge, Truth, and Duty: Essays on Epistemic Justification, Responsibility, and Virtue*, pp. 235–252, New York, Oxford University Press, DOI: 10.1093/0195128923.003.0015.
- Zhang, J., Talbot, W. S. & Schier, A. F. (1998), "Positional cloning identifies zebrafish one-eyed pinhead as a permissive EGF-related ligand required during gastrulation." *Cell*, 92 (2), pp. 241–251, DOI: 10.1016/S0092-8674(00)80918-6.

