

BOOK REVIEW

The Ethical Engineer: Contemporary Concepts and Cases. By Robert McGinn. Princeton: Princeton University Press, 2018. Pp. x + 340.

In *The Ethical Engineer*, Robert McGinn pitches a utilitarian ethic for practicing engineers (24, n. 5), "a foundational-contextual ethical responsibilities approach" to ethical judgment (309). By "foundational," he ostensibly means the "at bottom" dependence of ethical judgment on the harmful "consequences" of actions (24, n. 5), whereas "contextual" refers to the work environments and social milieus in which individual engineers make professional decisions. McGinn aims to avoid, in other words, both the *pedagogical* "superficial[ity]" (306) of "villain[izing]" (305, brackets mine) individual engineers in abstraction from their complex workplace relationships (2) and the *practical* superficiality of allowing individual engineers to relativize published codes of ethics to those engineers' moral satisfaction or ignorance (20).

Chapter 1 motivates McGinn's ethical regimen. McGinn compiles informal statistics from the late 1990s to suggest that a majority of engineers both encounter work-related ethical challenges and opine that engineering students should be taught about them. He likewise reports that engineering *students* generally receive an instructional "message" to promote ethics and safety on the job (4), but that such messages lack detail. Hence he advocates teaching engineering students "to make up their own minds about the ethical acceptability of prevailing workplace culture and practices" (6), a teaching best implemented by surveying engineering case studies in a stand-alone engineering ethics course.

Before laying out eighteen such case studies in his book, McGinn first identifies mistakes to avoid and principles to employ in ethical analysis. Chapter 2 anticipates, for example, various abuses of engineering codes of ethics in practical reasoning. Such codes are *not* to appear only in punitive hearings after the fact of an accident or disaster, nor can such codes justify the assumption that "no injunction" entails "no problem" for a given behavior. Neither does the "vagueness and uncertainty" (19–20) of codified language concerning human well-being facilitate ethical deliberation, in McGinn's view. McGinn therefore introduces in chapter 3 the four "fundamental ethical responsibilities of engineers" (22), principles enumerated as "FEREs" (28). FERE1 enjoins

the engineer “*to not cause harm or [the] unreasonable risk [thereof],*” while FERE2 goes further, transcending the “not-causing” of harm by demanding the attempt “*to prevent harm*” (28). FERE3 implores the engineer “*to try to alert and inform about the risk of harm,*” and FERE4 omits mention of harm altogether, reminding engineers to “*serve the legitimate interests of their employer or client*” (28). McGinn explains how the FEREs limit and motivate each other, and he appeals favorably (but not exclusively) to “John Rawls’s Difference Principle” to this end (32).

The FEREs find application in the eighteen case studies of chapter 4, which exceeds two hundred pages and makes up the bulk of the book. McGinn provides technical summary, ethical analysis, and moral lessons for sixteen historical and two hypothetical scenarios (Case 5: An Employee Database Management System; Case 10: Nanotechnology R&D). Among the historical cases are several chestnuts of the discipline (“Case 6: The Citicorp Center Tower”; “Case 7: The Union Carbide Pesticide Plant in Bhopal”; “Case 8: The Space Shuttle *Challenger*”; “Case 11: The Ford Pinto”; “Case 14: The Hyatt Regency Kansas City Hotel”), but McGinn also includes two cases on missile defense (“Case 2: SDI Battlefield Management Software”; “Case 13: TRW and the U.S. Ballistic Missile Defense System”), one on technology transfer (“Case 16: Innovations for Rural Kenyan Farmers”; Case 7 about Bhopal also involves technology transfer), and two on recent technological developments (“Case 17: Google Street View”; “Case 18: Opioid Biosynthesis and Neural Enhancement”). Several harms of work-life imbalance find coverage in “Case 4: The Apple Newton MessagePad,” and “Case 3: Collaborative Research Practices at Bell Labs” examines harms of plagiarism. For any given case study, McGinn first reviews the technical subject matter in some detail (often providing footnotes to supplementary resources) and then argues that agents in the case unjustly allowed harms (contra FERE1), admirably strove to prevent harms (per FERE2), blew the whistle through wide-ranging sectors of society (intracorporate, intercompany, court of law, or public media, per FERE3), or modulated their execution of FERE4 duties as the interests of their employers became unreasonable or unjustifiable. While McGinn gives a clear, ethical opinion about the actions of particular agents in each case, the reader can understand that the arguments are utilitarian and their conclusions debatable. Indeed, each case study features discussion questions that typically prompt debate over McGinn’s own claims.

Chapter 5 recapitulates what may be called the “moral lessons” of Chapter 4. Moral lessons are those ethical, not engineering-technical, takeaways from a case that generalize to other and future cases. One pertinent moral lesson that McGinn examines is what the ubiquitous injunction

to ““hold paramount”” human safety or welfare—an injunction headlining countless codes of ethics—means in practice or plain English (265). He suggests that depending on the case, holding paramount human welfare could translate to providing such differing goods as “*user-friendly computer interfaces*” and “*universal access to basic Internet service*” (266). Each claim requires independent argument, of course, but in my experience undergraduate engineering students may struggle to craft insightful moral lessons more sophisticated than “Don’t cut corners,” “Safety first,” and other platitudes. Hence I find McGinn’s extraction of moral lessons from real cases a brief but bright spot in the engineering ethics literature.

Whistle-blowing constitutes a major theme and frequent recommendation in the book, but McGinn constructs in chapter 6 a sobering account of *how little any organization or legal body is going to protect or advocate for whistle-blowers in the year 2018*. He reviews both dated and contemporary court decisions, legislative measures, and secondary research to conclude that a “clear conscience” is what will motivate ethical engineering practice more than will the *status quo* engineering culture (301). This culture currently yields few “protection[s] against employer retribution” or “economic reward[s]” for honesty (301). Further distinguished in chapter 6 are the slightly rosier prospects for whistle-blower protections among U.S. *federal* employees than for private-sector employees (297–98, n. 47).

McGinn concludes the book in chapter 7 by defending his account from Louis Bucciarelli’s criticism of ethical methodologies that ““oversimplify”” the decision-making process of any given engineer (302). “Bucciarelli seeks to replace . . . the dominant pedagogical focus on the ethical responsibilities of *individual engineers*,” McGinn explains, with the revelation “that engineering work is a *social* process” (305). Indeed, he parses Bucciarelli as rendering the *context* (“organizational . . . political”) of engineering practice ethically ““*fundamental*”” to ascriptions of individual blame (303, emphasis mine). The problem with asking an engineering student ““What should you do?”” for example, in the Bucciarellian scenario of a group of engineers attempting to fix autopilot software prone to stalling airplanes, a software *ex hypothesi* currently installed in production aircraft in the field, is that one solitary engineer is not a realistic candidate for solving such a multifaceted problem (304). McGinn replies that his approach accounts for social context in five ways: (i) through the FEREs; (ii) through cognizance of “sociotechnical features of . . . engineering work” (308), like “paradigm departure,” the condition of working with an unfamiliar product or process that requires extra attention in accord with FERe1 (273–74); (iii) through

cognizance of “social-organizational context” such as “heavy economic pressure”; (iv) through “macrosocietal context(s)” like technology transfer, and (v) through anticipation of harms distributed according to “Rawls’s Difference Principle” (309).

I selected *The Ethical Engineer* for my own teaching based on three factors: its up-to-date chapter 6 on whistle-blowing (non)protections, its coverage of recent technologies (Google and Opioids), and its overtly utilitarian bent. Not that I find utilitarianism persuasive as a norm; to the contrary, and as a former engineer myself (in good standing!), I think that engineers benefit most by understanding what *kinds of actions* are *intrinsically* wrong without exception. Falsifying data, intimidating versus motivating other persons, choosing to be uncharitable, choosing to be ungrateful, choosing to risk gravely harmful side effects without reason. The utilitarian, on the other hand, seems to me perennially susceptible to the temptation of choosing the most expeditious means to an end, *until* someone gets hurt, or *until* the risk of harm manifests. Not that all utilitarians are cavalier, baleful hedonists. Their repugnance for small dishonesties may prove greater than anyone’s, if only because the utilitarian hates her own, *principled*, powerlessness when it comes to committing such slights. To McGinn’s credit, the FEREs are well motivated, unobjectionable, and feasible; but they are unrealistic moral foundations or ethical fundamentals. I do not think that I am disposed to care for others, until I learn how all-deciding are my intentions for specifying the actions that I undertake, for my incurring moral guilt, and for my forming workplace habits. I have to care about being good before I care for anyone else. Nevertheless, I value McGinn’s book precisely for its rigorous endorsement of a single paradigm, its clear commitment to utilitarian analysis. Such consistency facilitates juxtapositions with Aristotle and Kant, and as I have opined elsewhere,¹ I think that the highly analytical persons who become engineers *should* be challenged with the information that someone (a philosopher) can almost always deliver a sophisticated charge of wrongdoing against the engineer who shirks rules, or who ignores society or ethics altogether. Even should propositions and principles not “stay with” an engineer, *challenges* stay with an engineer. Hence I agree with McGinn against Bucciarelli that normative paradigms should be taught to engineering undergraduates.

McGinn’s book is not, on the other hand, a silver-bullet ethics text. Some of the technical summaries (such as Cases 5, 9, and 10) would be insufficient for full credit were they submitted

¹ Nicholas Danne, Review of *Ethics Within Engineering*, by Wade L. Robison, *Philosophy* 93, no. 365 (July 2018): 458–59.

to me as coursework. Neither is every footnote to supplementary data reliable. Some footnotes reference only Wikipedia, and as of May 25, 2018, an important weblink for the Hyatt Regency case in footnote 410 (p. 192) did not work on my computer. The book's Achilles' heel, moreover, is its dearth of discussion on environmental ethics. "Case 1: The Cadillac DeVille/Seville Engine-Control Chip" goes some way toward assessing the "harmful effects" of carbon monoxide emissions "on human well-being" (44), but McGinn otherwise omits consideration of animal pain, the aesthetics of nature, harms to nonhuman life, and the difference between anthropocentric and biocentric environmentalism ("Case 15: The Manhattan Westway Project" is a difficult read, inconducive to discriminating the various harms facing the species of striped bass mentioned). With respect to whistle-blowing, McGinn could also profitably mention the scourge of social media on people's careers, and the impropriety of *ever* mentioning one's place of work on Instagram, Facebook, or Twitter, unless one is attempting to whistle-blow or works for one's employer's advertising department. Finally, chapters 1 and 7 seem more appropriate for instructors than for students to read. Otherwise, I value McGinn's contribution, and I recommend it for postsecondary instruction.

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