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Davis Discussant Remarks - APPE 2010

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Description

Comments from Dr. Michael Davis reflecting on presentations by Donna Riley and Sheila Jasanoff.

Body

I thought the talks by Donna Riley and Sheila Jasanoff were too abstract to be either persuasive or useful to engineers. Both Riley, herself an engineer, and Jasanoff, a social scientist, seemed to misunderstand engineering—and, in so doing, to misstate both the difficulties and the possibilities of incorporating social justice into engineering. Though good examples of what the field of science and technology studies (STS) has to offer, the two talks in fact illustrate the great weakness of STS, its inability to understand engineering as an activity distinct in important ways from technology as well as science.

The UN definition of “sustainable development” now includes both social justice (justice within society) and intergenerational justice (justice between present and future). Hence, those engineering societies that have, like ASME, already committed engineers to “sustainable development” have, arguably, already committed themselves to social justice. Apparently aware of that possible argument, ASCE has

(in a footnote) defined “sustainable development” more narrowly, that is, as “the challenge of meeting human needs for natural resources, industrial products, energy, food, transportation, shelter, and effective waste management while conserving and protecting environmental quality and the natural resource base essential for future development.” Why might ASCE have declined to embrace the wider definition of “sustainable development”? Why might engineers generally be hesitant to make social justice one of engineering’s objectives?

Riley specifically recalled the tradition of “social engineering” as precedent for what she proposed engineers now do. She seemed to have forgotten that “social engineering”—like “genetic engineering”, “re-engineering”, and (most recently) “financial engineering”—was an activity from which engineers were noticeably absent. The term “engineering” was borrowed to suggest the reliability characteristic of engineering. “Genetic engineering” might better be called “genetic cookery”; “re-engineering”, “organizational re-modeling”; and “financial engineering”, “financial alchemy”. “Social engineering” was simply social scientists trying to change the world—without much success. Why were social scientists so much less successful at changing the world than engineers typically are?

The ability of engineers to change the world depends on their taking the “engineering approach”, a way of working that began in France in the late 1600s. Central to this way of working is careful measurement, formulation of problems in mathematical terms, identification of relevant variables (or satisfactory surrogates), development of formal standards, routines for following those standards, and so on. The recent development of LEED standards for “green buildings” is an illustration of what engineers need for social justice to be part of ordinary engineering. For social justice to become part of ordinary engineering, an engineer must be able to say something like: “This steel beam has a social justice certification” or (even better) “This beam has a social justice score of 7 while its competitor has a score of only 2”.

I thought Riley misunderstood the joke she told about engineers and social scientists. Merely curious about the height of the steeple of a certain church, the engineers used their typical approach and the social scientists used theirs. The engineers’ approach, with its careful measurement and triple checking, seems wholly out of proportion to the purpose, satisfying mere curiosity. The approach of the social scientists, asking the church’s warden, seems the appropriate way, even though the warden’s information is less likely to be accurate. In this context, the engineers’ approach is laughable (though it would not be if the question were a

bridge's safety). The lesson here is that the engineering approach is not appropriate to every problem (not, as Riley thought, that social scientists are not "scientific"). Some problems are too small, too ill-defined, or otherwise not of the right sort to justify the engineering approach.

For philosophers, social justice is a subject of interest because "social justice" is not well understood. What's not to understand? There is, of course, the question of how to balance the welfare of future generations against the present generation—for example, should there be a discount for the future (as there is for the future value of money) or a limit on the number of future generations to be considered (lest the interests of the future swamp those of the present)? How much should the interests of possible people count against the interests of actual people? There is also the problem of how to distribute benefits even within the present generation. Do we consider mere poverty as such, nearby poverty over distant poverty, extreme poverty over milder sorts, and so on? There is even some questions concerning what poverty is—merely material or in part social or even psychological.

These philosophical questions cannot be settled by saying, "We know what poverty is." Generally, we can recognize *extreme* poverty, that is, those forms that are said to amount to living on a dollar-a-day. But we are not so good at recognizing the lesser forms, the sort associated in the US with obesity, expensive running shoes, and watching lots of television.

But even being able to recognize extreme poverty will not help engineers at work when they are, for example, trying to find out whether using a specific steel beam in Chicago will increase social justice, reduce it, or leave it the same. Lines of causation in engineering can be long and complicated—well beyond the power of any individual engineer, even a senior executive in a large corporation, to see on his own. To be able to see the effect of an individual decision, engineers work together, developing standards, including modes of inspection, labeling, certification, and even disposal. The reliability of engineering for social justice will be a matter of developing similar standards. Developing those standards, and the corresponding ways of working for social justice, probably should involve political and moral philosophers—as well as the usual participants in developing engineering standards (manufacturers, regulators, customers, and so on), social scientists (especially developmental economists), and those to be benefitted by the new standards ("the poor"). Developing standards of social justice will, I think, teach philosophers a good deal about what goes into making abstract theories of social justice useful—and

perhaps lead to revision (or rejection) of some of those theories. Given how uncomfortable most engineers are with talk of “social justice”—and how foreign such talk is to the contemporary education of engineers—engineers may take comfort in having philosophers around to help. Once the standards exist, including them in the technical education of engineers will not be hard. Until then, we have nothing useful to teach engineers about social justice (as, I think, the two talks illustrate).

I should add that engineering for social justice is not the same as “socially responsible engineering”. The term “social responsibility” comes from business ethics—where it identifies *charitable* activities of business, activities beyond obeying the law, doing what morality requires, earning a reasonable profit, and the like, for example, donating surplus computers to the local schools or allowing employees paid time off to volunteer in a soup kitchen. Unlike lawyers and physicians, engineers do not generally consider giving away engineering services an important part of their professional commitments. The reason is not hard to identify. Like architects, engineers generally require large resources to work properly. Those resources include a reasonable guarantee that engineers will be there to inspect, maintain, repair, and dispose of the products of engineering. Unlike Roman bridges, the works of modern engineering do not last long without engineers to look after them. Without engineers to look after them, even seemingly beneficent works of engineering, such as a suspension bridge, can soon become dangerous.

One problem with treating engineering for social justice as social responsibility is that there is generally no way to guarantee that engineering resources will be there after the original gift is made. It’s not that ordinary engineers lack the power but senior engineers, especially those in executive positions, have it (as Jasanoff suggested during the question period). The networks on which good engineering depends are far larger than any one corporation, however large, can control. Much of the world, especially the poorest parts, is (more or less) outside those networks. In those parts, even the best-intentioned product of engineering may not be maintained as it should, serve those it was designed to serve, or be disposed of as it should. What began as a contribution to social justice may, all things considered, turn out to have no effect on social justice—or, indeed, to work against it.

Consider Greg Allgood’s description of Proctor and Gamble’s attempt to provide safe drinking water for children in the poorest parts of the world. P&G’s solution is a packet of chemicals manufactured in the US, donated by P&G because P&G could

not create a market. Apparently, the packets cost too much to make market distribution practical. The packets are nonetheless an impressive piece of applied chemistry and corporate social responsibility. But I have no idea what effect they are having on social justice. Who receives those packets: the people most in need of them, the people nearest to the supply centers, or those with the best connections, biggest muscles, or most guns? What will happen when P&G decides it has done enough work on safe drinking water and goes on to another worthy project? Distribution of the water-purification packets is not sustainable as now organized. Much worthy charity leaves the poor more or less as they were. The benefits, though real, are only temporary.

Those who wish to help engineers serve social justice in effective (and sustainable) ways need to help engineers make social justice a routine part of engineering. Doing that is not a matter of lecturing engineers about the importance of social justice—as both Riley and Jasanoff did—or—as both also did—about what's wrong with the way engineers think. Helping engineers serve social justice is primarily a matter of helping them develop ways of working that will allow them to include social justice in their decisions in the way they now routinely include safety, reliability, cost, disposal, and so on. Serving social justice in this way may not sound very romantic, much less revolutionary; it is a matter of many small achievement rather than one big one. Yet engineers have in their incremental way done more to change the world for the better over the last two centuries than have all the revolutionaries shouting, "Social justice" or "Down with the rich". I hope this conference will help us move away from dramatic slogans toward the unromantic work of helping engineers develop the tools they need to contribute to social justice in the way engineers long contributed to improving the material conditions of humanity.

Resource Type

Essay

Topics

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