The second part of the volume contains ten essays on engineering design in its novel forms as it is currently emerging. From a technological perspective the split between these two parts may be clear; from a philosophical standpoint there is a more gradual distinction since the ethical, political, and societal claims that can be made when considering these emerging forms of engineering design can often be made through more traditional philosophical approaches. Yet, the current novelties in engineering also bring new issues to the table, or older ones in more lucid forms. Bioengineering and genetic engineering, for instance, raise a whole new avenue of issues concerning what it is to be human, when the by now realistic possibility of reengineering ourselves in considered.

In the three first essays of the second part – those by John P. Sullins, Bernhard Rieder and Mirko Tobias Schäfer, and Alfred Nordmann – designing in three such emerging engineering technologies are analyzed, showing how, respectively, robotics, software engineering, genetic engineering and nanotechnology encroach upon and change our thinking and evaluation of technology as it has been shaped by the more classical forms of technology. Bioengineering and genetic engineering applied to or envisage to be applied to humans, set apart the next three essays by Daniela Cerqui and Kevin Warwick, Inmaculada de Melo-Martín, and C.T.A. Schmidt. These range from a full acceptance and embrace of our trans-human future (especially as exemplified by Warwick's work), to the articulation of a range of serious objections to a future engineered humanity. The final four essays by Kristo Miettinen, Ulrich Krohs, Kathryn A. Neeley and Heinz C. Luegenbiehl, and Noam Cook, bring us to the designing of socio-technical systems. These essays argue for a systemic approach to technological design. Within design practices, technical artifacts are not to be taken as objects on their own, but as elements of wider systems that not only contain technical elements, but also human beings and social elements. Only in this way it will be possible to take due account in engineering design of the close relationships between technical artifacts, human agents, and social contexts.

Finally, the emerging shifting focus in engineering design from technological products proper to socio-technical systems, provides the link between engineering and architecture and to the third part of the volume containing six essays on architectural design. Here, several authors take up the question of the future of architectural design, urban aesthetics, and civic engagement in the context of newly emerging architectural forms. The first four essays by Howard Davis, by Steven A. Moore and Rebecca Webber, by Ted Cavanagh and by Joseph C. Pitt are historical, empirical, and philosophical in scope. Davis finds that in the 19th century the process of designing buildings became separated from the process of building them. Using empirical methods, Moore and Webber reinforce Davis' historical evidence by examining the masked politics found in the technology of linear perspective. Taken together, the three authors agree that the abstraction of architects and citizens from the material conditions of building has had negative consequences that can be countered only by innovations in design practice. Cavanagh and Pitt, although from differing perspectives, argue against the notion that we can generalize about the various environmental design disciplines or that any particular discipline can successfully exercise a universal approach. In sum, all of these authors argue that successful, or

good, design is situated in a particular social and ecological context. The last two essays by Graig Hanks and by Glenn Parsons take up the problem of how we should effectively evaluate the aesthetics of built space, as an extension of models of civic engagement and natural functions. Together, these essays provide a comprehensive overview of the promise of a more unified approach of understanding the combined architectural and engineering design aspects of built spaces.[17]

References

Baird, D., 2004, *Thing Knowledge: A Philosophy of Scientific Instruments*, University of California Press, Berkeley, CA.

Bell, B., ed., 2004, *Good Deeds, Good Design: Community Service Through Architecture*, Princeton Architectural Press, New York.

Blanchard, B. S., and Fabrycky, W. J., 1981, *Systems Engineering and Analysis*, Prentice-Hall, Englewood Cliffs, NJ.

Brand, S., 1994, *How Buildings Learn*: *What Happens After They're Built*, Viking, New York.

Bucciarelli, L. L., 1994, *Designing Engineers*, MIT Press, Cambridge, MA.

Feenberg, A., 1995, *Alternative Modernity: The Technical Turn in Philosophy and Social Theory*, University of California Press, Berkeley, CA.

Friedman, B., ed., 1997, *Human values and the design of computer technology*, Cambridge University Press and CSLI, Stanford University, New York.

Guy, S., and Shove, E., 2000, *A Sociology of Energy, Buildings, and the Environment: Constructing Knowledge, Designing Practice*, Routledge, London.

Henning, A., 2005, Equal couples in equal houses: cultural perspectives on Swedish solar and bio-pellet heating design, in: S. Guy and S. A. Moore, eds., *Sustainable Architectures: Natures and Cultures in Europe and North America*, Routlege/Spon, London, pp. 89–103.

Johnson, D. G., and Wetmore, J. M., 2007, STS and ethics: implications for engineering ethics, in: *New Handbook of Science and Technology Studies*, M. Lynch, O. Amsterdamska, and E. Hackett, eds., MIT Press. In press, Cambridge, MA.

Kaplan, D. M., ed., 2004, *Readings in the Philosophy of Technology*, MD, Rowman and Littlefield Publishers, Lanham.

Katz, E., Light, A., and Thompson, W., eds., 2003, *Controlling Technology*, Prometheus Books, Amherst, NY.

Kroes, P. A., and Meijers, A., 2006, Introduction: The dual nature of technical artefacts, *Stud. Hist. Phil. Sci*. **37**(1):1–4, which introduced a special issue on philosophy of technical artifacts.

Lang, J., 1980, The built environment and social behavior: architectural determinism re-examined, *VIA* **4**:146–153.

Larsen, M. S., 1993, *Behind the Postmodern Façade: Architectural change in late twentieth-century America*, University of California Press, Berkeley, CA.

Le Corbusier, 1990, Towards a new architecture: guiding principals, in: *Programs and Manifestoes on 20th-century Architecture*, U. Conrads, ed., MIT Press, Cambridge, MA, p. 59.

McGee, G., 2003, *Beyond Genetics*, Harper Collins, New York.

Meyer, H., 1990, Building, in: *Programs and Manifestoes on 20th-century Architecture*, U. Conrads, ed., MIT Press, Cambridge, MA, p. 120.

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