in the smaller cross-sectional area of dimension lumber, railways were extended into the forests, and year-round work created economies at larger mills.[2] Construction methods changed in concert. The problem of shrinkage was by-passed in the design of the system of construction so that all wood members bear load vertically. Lumber was manufactured with the grain oriented so any shrinkage happened horizontally across its small non-bearing cross-section.

Wood production channel natural strength into small extrusions – a) trees are strong structures, cantilevered vertically; whole wood uses this natural structure, b) graining pattern in milled plank is visual key to identifying and aligning the natural structure, c) the linear structure of cellulose is oriented lengthwise along the main axis of lumber – tying production to a holistic structural concept embedded in a method of construction – a) structure in heavy timber frame depends on each joint, as strong as weakest joint; wood is used in ways that approximate its natural strength and geometry, b) joints increase in number, weaken, other elements such as cladding contribute structurally; new understandings of strength of wood create wiser use of cross-section and species, c) joint failure tolerated if statistically unimportant, total house becomes a structural system; the framing and the cladding contribute to a holistic sense of structure across the system.

The structural calculation of light wood frame requires a shift in understanding of structural performance. It acts partly as a frame structure and partly as a panel structure and it is stronger than any calculation that assumes that it is either one or the other.

The wider distribution of wood products demand reduced weight and uniform dimension. a) the real weight and hauling of trees individually logged is mitigated by horse and winter sled, b) distant logging limited by water transport, lumber distributed nationally by rail c) automated forestry equipment and saw mills suggest clear cutting and the utilization of all by-products of production, and requires a culture-wide reconceptualization of building permanence. a) houses are perceived as solid structures bearing heavily on the ground, permanence depends on mass, b) homes for the elite are masonry or stone, yet larger homes that are made of wood have lasted years, c) the appearance of permanence is no longer a function of construction, evidence of construction disappears into the wall (Cavanagh, 2000).

Incredible reductions in the cost of transport and distribution have led to the displacement of natural resources outside of their native ecosystem. Today, wood has gradually become a worldwide norm for residential construction, reconfiguring cultural perceptions of durability and competing with local building traditions. It is lighter and distributed more effectively than other conventional materials, and it is more cost-effective than newer materials.

Whereas Hughes reveals the history of large system technologies, Andrew Feenberg analyzes their implications in the philosophy of technology. Both Hughes and Feenberg are critical of their inertia. Both imagine alternatives. “A critical

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[2] Immersion in water diluted the sap, assuring more even curing, free of warping, when lumber was subsequently stacked to dry. Maybee (1960) outlines the impact of railways.

account of modern technical rationality could be developed … with a view to constructive change …" Feenberg (1999) suggests, it needs "… a radical redefinition of technology that crosses the usual line between artifacts and social relations assumed by common sense and philosophers alike."

3 Conclusion

The philosophy of technology usually confines itself to engineering design and reverts to a twentieth-century model of technology. This chapter shows how one designer interprets the tools of philosophy. By focusing on a case study, I have shown the potential to raise interesting questions and fruitful discussion outside of engineering artifacts. Applied more broadly, this should lead to new ways of understanding design and the everyday technology of buildings that define our lives. The boundaries between technology and the social or cultural world always seem porous to architects and historians of technology. This makes definition and analysis more elusive, but allows for a conceptualization around ideas that refuse to grant technology any neutrality or view it as a simple instrument, tool or means to an end. Consider the diversity of design and, thus, diffuse our elective affinity to positivistic views of technological development.

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