

Critical Theory of Technology and Theoretical Critiques

After twelve years of disseminating information to 5,600 research institutions and civil society organizations, mainly in developing countries, the Biotechnology and Development Monitor has asked us to take over the journal and continue to publish on the interrelation between biotechnological and developmental issues. Knowing that the monitoring of agro-industrial biotechnology and its social-economic impacts is nowadays carried out by many other organizations and institutions, we have chosen to change the Monitor into a scientific, peer-reviewed journal, Tailoring Biotechnologies, in which critical theory in biotechnology and development will be further elaborated. We think it may be socially and scientifically worthwhile to publish on the attempts of social movements, civil society organizations, and research institutions in different countries to appropriate biotechnologies and transfer them into catalysts for development and change.

As the name already suggests, the journal Tailoring Biotechnologies does adhere to the idea that biotechnologies are products of agency and knowledge systems developed within particular contexts. Biotechnologies are socially constructed and this social construction of biotechnology is to be considered a complex and sometimes contradictory multi-actor and multi-agency process. The idea that biotechnologies are socially constructed or, in the wording of the journal's title, tailored, is not a new idea but is constituted in the tradition of critical theory in social sciences.

The social construction of technology does not only take place at the stage of research development. Technology may also be appropriated and redeveloped by its users. Bertolt Brecht and Walter Benjamin named this appropriation of technologies 're-functioning', which they then (the 1930's) defined as the efforts of engineers and workers to change the content of the technology they were working with. The journal will thus present and reflect on contemporary examples of what Brecht and Benjamin in another time and place termed the re-functioning of technologies.

The imagination of an alternative functioning and social embedment of biotechnological developments is often lacking. The critique of biotechnology appears to take on the form of either total rejection or the proposal of measures to protect against the agro-industrial biotechnological developments. The perspective of transforming the technology to accommodate it to values excluded from the original design networks (**Feenberg**), to develop another ensemble of social and technical elements in biotechnology and genomics (**Ruivenkamp**) is often neglected. Nevertheless some "underground" efforts are made to appropriate the agro-industrial biotechnological developments and transfer them through tailoring activities into catalysts for development 'from within'.

The *potentialities* of reshaping biotechnologies form the core of the contributions in the first issue of this journal. However, these potentialities are also identified through serious study of what is or even what may become. Therefore, *critiques* are also expressed on specific scientific theories and a quest is initiated for the launching of new theoretical and analytic frameworks. **Feenberg** makes a plea for combining the substantive critique of technology with constructivist technology studies in a new framework called instrumentalization theory, in which an analysis of technology on two interrelated levels is proposed which may facilitate the development of a general account of the strategies employed in these "underground" movements.

Schuurman emphasizes that globalization urges a re-orientation of development studies and make a plea to reconsider the role that the nation state may play within the new context of a spatial economy of disjunctive dynamics (Appadurai) in which the economic, political and social-cultural domains follow their own time-space paths and are no longer bound to the geographic/physical context of the nation state.

Magnaghi goes beyond the functionalist and strictly environmentalist approach and presents a territorialist approach of sustainable development. He refers to a new space within post-Fordist society for a social re-appropriation of widespread forms of knowledge to produce local self-sustainable societies, transforming production and consumption patterns.

Ruivenkamp reflects on some basic assumptions present in the international pro-anti biotech debate and emphasizes the need to develop new co-creative relations between biotechnological and location-specific endogenous developments. He makes a plea for challenging the three uncoupling processes in global food systems, on which the hegemonic position of (im)material biotechnological products is based, and proposes to support the bottom-up, redesign movements in various localities through which biotechnologies are transformed and related to location-specific sustainable developments.

Damodoran deals with the effort of tailoring biotechnology development in coffee production to the needs of coffee growers. He refers to the limitations of traditional systems of research and dissemination of technologies which no longer appear to be a viable option, and refers to the de-technification movement as a counter current to the bio-technification approach of the Coffee Board.

Wekundah reflects on the experiences of the Kenya/Netherlands Biotechnology program on nine product-projects in which it was already aimed to tailor biotechnologies for resource-poor farmers, and wonders whether and how genomics may be accommodated to the solution of compelling problems of poverty, drought, land degradation, and increased pests and diseases, and whether modern technology can become accessible in marginal areas where little or no agricultural research work has been done.

Hughes goes further into the scientific and technological development of genomics as such, and stresses that more attention should be paid to another scientific paradigm. He criticizes the re-materialized conceptualizations in the contemporary view on genes and genomes, and calls for an alternative viewpoint which regards genomics as a space of activity and sees genes as activities within that space. According to Hughes these contrasting conceptualizations also reflect a divergent motive for dealing with the world and its complexity. He proposes to accept the two conceptualizations and support their co-existence, but at the same time emphasizes the need to bolster the neglected view.

This final point of paying attention to neglected ideas and even neglected values is another issue that is dealt with in the various contributions. **Feenberg** emphasizes that democratization of technology is about finding new ways of privileging these excluded values and realizing them in new technical arrangements. This implies restoring the agency of those treated as objects in the dominant technical code, under which technologies are realized with biases reflecting the unequal distribution of power. **Ruivenkamp**, **Domodoran** and **Wekundah** give concrete examples of experiences through which the narrow range of interests represented in the artifacts has been broadened. In addition, **Magnaghi** refers to the potentiality of local self-sustainable developments through the rebirth of new community practices in which the re-functioning of artifacts may take place.

Alongside the presentation of innovative ideas about potentialities, the authors also present many different examples, many *actualities*. **Hughes** refers to breast cancer research, the treatment of children with immune deficiency, herbicide-tolerant crops and application of molecular markers. **Wekundah** refers to nine products tailored to the needs of resource-poor farmers. **Damodoran** discusses the coffee experience in India. **Ruivenkamp** refers to various examples of relinking agriculture to environment and to local food consumption. **Schuurman** discuss the role of the nation-state in developmental studies. **Magnaghi** deals with new community practices and discusses several Italian cases of reappropriating local knowledge and technologies. **Feenberg** refers to the experience of on-line education.

It is striking, however, that different opinions are expressed about the *spaces* in which the potentialities of these actual developments can unfold. Referring to Appadurai and Leo Ching, **Schuurman** discusses how under globalization the political, economic and social cultural domains increasingly follow their own time-space paths, and that whatever interconnecting logic is left, it is not bound within the context of the nation-state. **Ruivenkamp** also shows that the development of biotechnology within the agro-industrial production chain blurs differences between the political, economic and social cultural domains. If these domains are becoming part of different, transnational spaces, then they are no longer hold together by the nation state. If there is a de-territorialized world, in which geography is ended and we move towards international social spaces, still the crucial question remains as to which dialectical relationship between global and local developments emerge and how technology is influencing these relations.

Referring to Henri Yeung, **Schuurman** emphasizes that although the global invades local contexts of actions, it does not destroy them, but instead new forms of local resistance and local expression emerge, reinforcing the interconnectedness of the local and the global and the multiplicity of hybridization of social life in every social space. **Magnaghi** in his article not only presents various examples of this, but also explains that the post-Fordist context may facilitate these *reinventions of locality*. **Ruivenkamp** also emphasizes that new local forms of expression emerge in relation to global biotechnological developments, and that splitting contradictions may appear in the research domain of (sub)politicizing products. Finally, **Feenberg** makes a plea for challenging the technological power which is the principle form of power in actual society, and emphasizes the need for change in the technical code of new technologies and integration of neglected contexts and interests in technological design without a loss of efficiency.

The social and scientific challenge in the immediate future will be to find out which social space may be created to elaborate a democratization of new technologies such as biotechnology and genomics, and to find ways of privileging such excluded values and realizing them in new technical arrangements. This may be achieved from a basis of combining the territorialist approach of local sustainable developments in relation to global developments, combined perhaps with critical-re-constructivist approaches in technology developments. We hope that this first volume of the journal *Tailoring Biotechnologies* makes a contribution to a reflection on these potentialities, actualities and spaces.

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