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Introduction: Diversion and Globalization in Biomedical Technologies

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The intensification of transnational exchanges since the mid-twentieth century has contributed to the global diffusion of biomedical technologies and shaped their histories in dramatic ways. These technologies became a central medium for a vast array of practices found in medical institutions worldwide, as well as a blurring agent of the boundaries between nature and culture (Lock and Nguyen 2010, Rheinberger 2000). However, technologies such as medical imaging, genetic testing, pharmaceuticals and in-vitro fertilization (IVF) are defined and embedded within normative

frameworks consisting of both explicit and implicit rules, as exemplified by Bateman (2006). Manufacturers of technological devices, and their routine uses by biomedical practitioners, professional associations which take part in their conception, national governmental and international bodies which play a role in their diffusion, all draw on these frameworks. Once entangled with each other, these elements give birth to mainstream, albeit heterogeneous and fluctuating, uses of biomedical technologies.

These technologies therefore recast medicine in a normative framework – or, as the articles in this issue show, a series of frameworks the norms of which vary along space and time, conditioning medical practice. This process has long been described as political, as it usually takes place in relation to central governing structures and entails remarkable transformations of therapeutic power. Not only medical knowledge and practice, but also the possibility of a discourse on medicine, are thus subjected to a profound reorganization (Foucault 1963), involving the moral foundations of medicine and therapeutic power, as these concern values and the nature of right and wrong (Stengers 1997). Biomedical technologies have a normative dimension, the character of which is both political and moral (Murphy 2012). While many studies have drawn attention to the social, epistemological and cognitive dimensions of contemporary changes in medicine, it is important to observe the moral inflection of these transformations (Fassin 2000). This is all the more true when speaking of norm-generating, ethically challenging biomedical technologies.

The recent mass HIV infection in a small village area of northwestern Cambodia is a case in point (Fuller 2015). Dozens of people who were infected were treated by a village doctor who had his own take on the use and manipulation of medicines and syringes. For over 20 years, his services were frequently sought after and he was considered a generous person. Today his non-standard practice—involving the use of unsterilized syringes and sharing them amongst patients—is recognized as utterly damaging, and the ‘doctor’ is in jail, not only legally but also morally accused.

Deviant uses and practices of biomedical technologies can heal or kill in unexpected ways and at unforeseen times.

These technologies and their ambivalence have been widely studied (Bharadwaj and Glasner 2009, Dumit 2004, Livingston 2012, Ong and Chen 2010, Ostherr 2013, Petryna et al. 2006, Saunders 2008, Taylor 2008, van der Geest et al. 1996, van Dijck 2005, Wilson 2010), yet scant attention has been paid to their 'off-label' uses, i.e. to the ways the normative and moral universes of these technology strive are often redesigned, challenged and repurposed. Examples abound. As a representative case, sperm banks illustrate the porous line between gamete conservation, IVF technology, and the way that fetuses marketed *à la carte* share intriguing features with eugenic practices (Almeling 2011, Fortier 2012, Madge 2012). In Western Africa, in clinical trials, medical research generates "a local micro-culture of research" which is partly based on a set of appropriations (by inhabitants, local staff members and researchers) of international scientific and institutional rules. The ability of clinical trials to build health care facilities, for instance, helps to understand how experimental logics can be diverted into developmental ones (Ouvrier 2014). We could speak in this vein of the unfortunate links between obstetrical sonography and sex-ratio imbalance, of the fetishization of medical imaging, of the use of biomedical technology for political ends, of the hazardous proximity of genetics and biological/social discrimination, or again, of the way stem cell therapy may be used in Asia to bring credibility and legitimacy to beauty and alternative therapies, while at the same time capitalizing on the wellness tourist industry and its cosmetic declinations to market experimental stem cell treatments. Considering biomedical technologies calls for new kinds of analyses.

This special issue is the first comprehensive contribution to this little explored, but socially and sociologically significant domain of enquiry. We are interested in the appropriation and the diversions that characterize global biomedical technologies in real life, in the adjustments of practices and knowledge in relation to these technologies under particular social and cultural

conditions. How to frame these situations? How to formulate our object of study? These questions were systematically raised during the year-long seminar series “Globalization and Biomedical Technologies: Circulation, Appropriation and Diversion” organized at the Ecole des Hautes Etudes en Sciences Sociales in Paris from October 2012 to June 2013. Distinguished speakers were hosted, each of them discussing during one monthly session the nuances of *détournements*, *dérivations*, *captations* and *déviations*, of diversions, divergences, deviations and hijackings: paths that were supposed to be followed, paths that were chosen instead, multiplication of directions, and departure from accepted norms. If the French language can “*détourner*” — with the same verb — a conversation, a river, an amount of money or a plane, English “diverts” resources, traffic or funds, but “hijacks” an aircraft or a train (which involves constraint and often violence). Among the embedded meanings of “hijacking” is the idea of capture or theft that is absent from “diversion”, but both terms share ideas of transit and reorientation. The luxuriance of this lexical field reflects the myriad forms that off-label use of biomedical technologies may take.

These lexical reflections led us to consider three dimensions of the ways biomedical technologies may be alternatively used: first, orientation, i.e. aims or purposes of biomedical technologies (the initial, and the diverted/re-oriented one); second, dynamics, since uses — be they off-label or not — are processes, as are their modifications; third, ownership (of the diverted technology, of the challenged norm), since off-label supposes the existence of a referential and legitimate use that is not enacted. By using a specific biomedical technology outside of this referential, one can be considered as ‘robbing’ something from the holders of this ‘normal’ use.

Observing each of the cases presented in this issue through the lens of these three dimensions raises many questions. How can we analyse the contrast between the original use of a biomedical technology and its new, diverted orientation? Can we ‘measure’ the amplitude of diversions in the light of what local biopolitics consider to be a ‘normal’ use? What is the content of the referential norm, the benchmark: is it made of techniques, morality, experience, explicit regulations? Who

decreed it? And thus, who is challenged by the escape from this referential and why? Is there a difference between diversions that go beyond the scope of biomedicine and those that remain within biomedicine? Are diversions always contesting normative biomedical power and setting up new moral orders? Are they sometimes foreshadowing future legitimate uses? From Egypt to India, from x-rays to genomics, in this special issue we want to bring critical, ground breaking elements of response to this set of questions.

In the articles gathered in this volume, the authors cover anthropological and sociological work from Brazil, Egypt and Mexico, India, Switzerland, France and Jordan, but also in cyberspace. On the basis of original ethnographic studies, our contributors discuss changes in orientation, dynamics and ownership that characterise diversion in biomedical technologies and the way global best practices rules (such as World Health Organization guidelines) interact with their local declensions. While these horizontal themes cross each of the articles, the contributions are organized in four groups, which sometimes overlap. These groups reflect the various levels that can be impacted by diversions in biomedical technologies: international professional norms; moral worlds and transgressions; epistemology and knowledge production; and the aims of technologies.

In Attewell's and Maffi's articles, the reshaping of biomedical technologies directly challenges international best practices standards and/or mainstream professional uses. Guy Attewell examines the diversion of x-rays in an Indian bone-setting clinic, where the main purpose of x-rays stops being diagnosis. The technology is framed as a materialization of the therapeutic impact of the practice, and thus takes part in the production of efficiency outside of the mainstream health institutions. X-rays thus become a legitimizing practice, outside of the legitimate frame of biomedical institutions. Irene Maffi follows the circulation of active management of labor (AML, a practice aiming at shortening labor duration for first-time mothers) from its native Irish hospital to maternity wards in Jordan and Switzerland. She shows how the 'script' of this obstetrical technology

is reshaped by local contexts, and so shows how AML is deviated from its original Irish-defined goals.

In their contributions, Hamdy and Crowley-Matoka and Klotz examine transgressions (and occasionally modifications) of pre-existing moral orders. Sherine Hamdy and Megan Crowley-Matoka unsettle the implicit construction of the family as the locus of ‘altruism’ in the calls of activist to criminalize the global trade in human organs. These authors unpack the ways in which family members draw on gendered tropes about motherhood and female fertility in Egypt and Mexico to figure transplantation as potentially disruptive, but also potentially restorative to heterosexual unions and reproductive viability. Maren Klotz also deals with changing moral orders: she investigates the online intricacies of assisted reproductive technologies (ART) and direct-to-consumer genetic testing (DTCGT) services. She describes subversions of ART’s frame of secrecy and diversions of DTCGT genomic information that aim at connecting ‘donor-siblings’, i.e. individuals conceived with the gametes of the same anonymous donor.

The local moral worlds and socio-political contexts can also redesign the purposes of biomedical technologies. This is exemplified by Gibbon’s and Bärnreuther’s contributions. Sahra Gibbon addresses the growing use of results from population genetics studies in the context of health care. She discusses the use of genomic ancestry categories in cancer genetics in Brazil and shows how they equivocally interact with the local social diversity system — for geneticists and patients. Based on her study of Indian IVF clinics, Sandra Bärnreuther addresses other diversions of ART: she deals with “gamete-mixing” and “gamete-exchange” and the way they resonate with local perception of relatedness and lab work.

Finally, Baptiste Moutaud explores a case that challenges epistemological conceptions of the way biomedical technologies produce knowledge. He examines the new range of uses that French surgeons and patients found for Deep Brain Stimulation (DBS) — besides its initial therapeutic

purpose in specific neurologic and psychiatric disorders. He shows how these experimental and self-enhancing practices contribute to reshaping the scope of neuroscience activities.

With this special issue, we intend to provide different insights for the anthropological and sociological study of norms as statistical (the average), moral (the normal) and thus social objects on the one hand, and some of the more unexpected impacts of therapeutic globalization on the other hand. We aim to explore the processes involved in the circulation of technologies and bring attention to the role of globalization not only as a vehicle, but also as a transformative agent of biomedical technologies. As a whole, this special issue addresses two striking aspects of biomedical technologies: their ubiquity and their profound ambivalence.

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