



Michi Knecht, Maren Klotz, Stefan Beck (eds.)

REPRODUCTIVE TECHNOLOGIES AS GLOBAL FORM

*Ethnographies of Knowledge, Practices,
and Transnational Encounters*

campus

Reproductive Technologies as Global Form

Eigene und fremde Welten

The series »Eigene und fremde Welten« is edited by Jörg Baberowski, Vincent Houben, Stefan Beck, Thomas Mergel, and Gabriele Metzler in connection with the Collaborative Research Center no. 640 »Representations of Changing Social Orders: Cross-Cultural and Cross-Temporal Comparisons« based at Humboldt-Universität, Berlin (Germany).

Volume 19

Michi Knecht, PD Dr., is a senior researcher and lecturer at the Department of European Ethnology and the Collaborative Research Center no. 640, »Representations of Changing Social Orders. Cross-Cultural and Cross-Temporal Comparisons« at Humboldt-University, Berlin.

Maren Klotz is a research fellow and PHD candidate at the Department of European Ethnology at Humboldt-University, Berlin.

Stefan Beck, Dr., is professor for European Ethnology at Humboldt-University, Berlin.

Michi Knecht, Maren Klotz, Stefan Beck (eds.)

Reproductive Technologies as Global Form

Ethnographies of Knowledge, Practices,
and Transnational Encounters

Campus Verlag
Frankfurt/New York

© Campus Verlag GmbH

Bibliographic Information published by the Deutsche Nationalbibliothek.
The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie;
detailed bibliographic data are available in the Internet at <http://dnb.d-nb.de>
ISBN 978-3-593-39100-7

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without permission in writing from the publishers.

Copyright © 2012 Campus Verlag GmbH, Frankfurt-on-Main

Cover illustration: © Dino Rigoli, Serie »planctus«, 2009–2010.

Cover design: Campus Verlag, Frankfurt-on-Main

Printing office and bookbinder: CPI buchbuecher.de, Birkach

Printed on acid free paper.

Printed in Germany

This book is also available as an E-Book.

www.campus.de

www.press.uchicago.edu

Contents

Acknowledgments	9
Reproductive Technologies as Global Form: Introduction	11
<i>Michi Knecht, Maren Klotz, Stefan Beck</i>	
Five Million Miracle Babies Later: The Biocultural Legacies of IVF	27
<i>Sarah Franklin</i>	
Localizing In Vitro Fertilization: The Cultural Work of Encounters with Medical Technologies	
Legacies and Linkages: Episodes in the Establishment of New Reproductive Technologies in Contemporary Sri Lanka.....	61
<i>Bob Simpson</i>	
Practitioners as Interface Agents between the Local and the Global: The Localization of IVF in Turkey	81
<i>Zeynep B. Gürtin</i>	
Making Connections: Reflecting on Trains, Kinship, and Information Technology.....	111
<i>Maren Klotz</i>	

National Styles of Reproductive Governance and Global Forms

The Other Mother: Supplementary Wombs and the
Surrogate State in India139
Aditya Bharadwaj

Assisted Reproductive Technologies in Mali:
Asymmetries and Frictions161
Viola Hörbst

Concerned Groups in the Field of Reproductive
Technologies: A Turkish Case Study197
Nurhak Polat

Tracing Transnational Scapes of Reproductive
Technologies: Emergent Forms and Domains
of Regulation

Globalization and Gametes: Reproductive »Tourism,«
Islamic Bioethics, and Middle Eastern Modernity229
Marcia C. Inhorn

Reproducing Hungarians: Reflections on Fuzzy Boundaries
in Reproductive Border Crossing.....255
Eva-Maria Knoll

What is Europeanization in the Field of Assisted
Reproductive Technologies?283
Maren Klotz & Michi Knecht

Transnational Reproductive Mobilities,
Materialities, and Agencies

Making Interferences: The Cultural Politics of Transnational
Ova »Donation«305
Michal Nahman

Resemblance that Matters: On Transnational Anonymized
Egg Donation in Two European IVF Clinics331
Sven Bergmann

Biomedical Mobilities: Transnational Lab-Benches and
Other Space-Effects357
Stefan Beck

Notes on Contributors375

Index of Names and Places381

Acknowledgments

This volume is the product of a collective effort and many discussions during the workshop »IVF as Global Form. Ethnographic Knowledge and the Transnationalization of Reproductive Technologies,« organized by Michi Knecht, Maren Klotz and Stefan Beck for the research project »Kinship Cultures and Reproductive Technologies« as part of the Collaborative Research Center no. 640 (SFB 640), »Representations of Changing Social Orders. Cross-Cultural and Cross-Temporal Comparisons« at Berlin's Humboldt-University, June 12 – June 14, 2008. The workshop received financial support from the German Research Foundation (DFG), for which we are truly grateful. We wish to express our special thanks to Sarah Franklin for accepting our invitation to hold the keynote lecture. The workshop also profited enormously from the contributions by Willemijn de Jong, Bernhard Hadolt and Elizabeth Roberts. We much regret that for a number of different reasons it was not possible to include their papers in this volume.

The discussions during the workshop benefited greatly from the commitment and the investments of our chairs and commentators Christine Bischof, Tanja Bogusz, Jeanette Edwards, Babette Müller-Rockstroh, Ferhunde Özbay, Shalini Randeria, Carmel Shalev, Michael Schillmeier, and Shahana Schmidt. Their thoughtful comments, stimulating analyzes and advancing questions have found their way into this book via the process of developing and rewriting the earlier versions presented at the workshop into full papers. During the workshop, participants and organizers alike could always rely on the support from our student assistants Feray Halil and Franziska Wegener and on the management and organizational skills of our colleague and PhD student Sulamith Hamra. As editors, we have benefited greatly from the intellectual and academic environment pro-

vided by the Collaborative Research Center ›Representations of Changing Social Orders: Cross-Cultural and Cross-Temporal Comparisons«. Warm thanks are extended to all our colleagues there. Finally, we owe thanks to Xenia Krüger for helping to organize the workshop, to Kareth Schaffer for language-assistance, to Robin Cackett for final editing and to Anika Kreft and Sascha Stingl for their scrutiny in preparing the manuscript.

Stefan Beck, Maren Klotz and Michi Knecht, Berlin, May 2012

Reproductive Technologies as Global Form:

Introduction

Michi Knecht, Maren Klotz, Stefan Beck

A few years after the British Government had made ova and sperm donation non-anonymous in 2005, one of the editors of this volume spent a series of rainy summer afternoons in a sperm bank in Northern England. Maren Klotz was shadowing the practices of the two young female biologists working in the laboratory and the administration office. She was shown how to count sperm cells under the microscope following WHO standards to determine semen quality. The staff told her that the interlaboratory testing rounds to establish a high level of standardization within these quality measurements, existent both in Germany and Great Britain, were »fun in a geeky scientist kind of way.« And she tried to understand how the minute guidelines of the British Human Fertilisation and Embryology Authority (HFEA) were actually playing out in the English clinic. When biologists Rose Daffyd and Canelle Ukwu quizzed her about the German regulatory situation they could not believe that in Germany ova donation was illegal while sperm donation was allowed and actually hardly regulated at all. One afternoon Ukwu, who was mainly in charge of donor recruitment and administration and who was spending a gap year before going back to a prestigious university to pursue postgraduate studies in cell biology, showed this editor how to centrally register sperm donors with the HFEA. The main bulk of information was filled into an Electronic Data Interchange (EDI) document and electronically transferred to the HFEA computers. »How is that handled in Germany?,« Canelle Ukwu asked. »We have also had a change in regulations,« Maren Klotz said. »It is non-anonymous donations in Germany now as well, but what kind of data needs to be stored and how it could actually become accessible is quite unclear to German experts.« Klotz added she would next be interviewing British donor-conceived persons who had used the service

UK Donorlink to potentially find half-siblings and donors via DNA testing. Ukwu shook her head and said that she did not understand at all what was motivating these searches or why the HFEA should make available the information she was just punching into her keyboard in 18 years: »My family is from Cameroon and my father, the man who raised me, my mother's partner, also isn't my biological father. Why should I care about that?« Ukwu asked. »Where my family is from,« she added, »it's normal that children are raised away from their biological parents. Don't people in Britain have more important things to do than look for their sperm donor or half-siblings they have nothing to do with?« She shook her head in a gesture as if she viewed such endeavors as English extravagance. Then she offered her view as a biologist: »Medical histories of family members have become less important nowadays anyhow; you can simply use genetic testing if you want to know something about risk susceptibilities.« The donor-conceived adults Maren Klotz met later that night were of a different opinion: They mourned the absence of identifiable donor information for them and cursed that they had been born before the comprehensive regulations on reproductive technologies had come into force in Britain. One of them had spent years being monitored for a hereditary condition prevalent on her father's side before finding out she was donor-conceived.

Ukwu's casual commentaries in the ethnographic vignette above capture quite pointedly some of the contemporary questions raised through reproductive technologies within a period of increased globalization, questions which have motivated the compilation of this book: Reproductive technologies have spread across various kinds of boundaries and into socially and culturally diverse settings, situations and regions. However, while people, technologies, human gametes, knowledge and ideas about appropriate regulation circulate widely, the legislation of reproductive technologies is still primarily implemented in territories, whose borders are duly policed by a nation state. Furthermore, local articulations of assisted reproduction in their uneven technological spread across the globe never take place in a social or economical vacuum: They instead become part of emergent national styles of reproductive governance¹

1 Lynn M. Morgan & Elizabeth F.S. Roberts, »Rights and Reproduction in Latin America«, in: *Anthropology News*, March 2009, pp. 12, 16.

shaped in interaction with local understandings of kinship, the role of »biologies and the biological«², legitimate family forms, prevalent gender asymmetries and economic considerations. As a result, the proliferation of reproductive technologies into different contexts of appropriation does not lead to homogenous forms of deployment. Rather, it has led to a wide range of very different forms of regulation, bans, and approvals as well as to considerable differences in clinical practice, public or private financing, and moral or ethical reasoning. A multi-local configuration has emerged from the multitude of practices that are generating, transferring, acquiring, imagining, and regulating reproductive technologies across and beyond regional and national borders: a transnational or even global »assemblage«³ that constantly re-defines and re-produces reproductive technologies and its contexts, both locally and globally.

During the interaction in the British sperm bank described above the participants level out a number of differences they collaboratively detect and evaluate. The short vignette is exemplary for the broad range of very different rationalities, practices, and legal regulations that can be observed within a single situation or institution »doing« reproductive technologies and even more so when comparing different settings. The field observations described are part of a collaborative research project, established in 2005 at the Department of European Ethnology at the Humboldt-University in Berlin⁴, which focuses on the nexus of knowledge, kinship, regulation and reproductive technologies, generating comparative longi-

2 Sarah Franklin, »Biologization Revisited: Kinship Theory in the Context of the New Biologies«, in: *Relative values: reconfiguring kinship studies*, ed. by Sarah Franklin & Susan McKinnon (Durham, NC: Duke University Press, 2001), pp. 302–328.

3 Cf. Stephen J. Collier & Aihwa Ong, »Global Assemblages, Anthropological Problems«, in: *Global Assemblages. Technology, Politics, and Ethics as Anthropological Problems*, ed. by Aihwa Ong & Stephen J. Collier (Malden, MA et al.: Blackwell, 2005), pp. 3–21; Helen Watson-Verran & David Turnbull, »Science and Other Indigenous Knowledge Systems«, in: *Handbook of Science and Technology Studies* (rev. edition), ed. by Sheila Jasanoff, Gerald E. Markle, James C. Petersen & Trevor Pinch (Thousand Oaks, London and New Delhi: Sage Publications, 1995), pp. 115–139; George E. Marcus & Erkan Saka, »Assemblage«, in: *Theory, Culture & Society* 23 (2006), 2/3, pp. 101–106; John Phillips, »Agencement/Assemblage«, in: *Theory, Culture & Society* 23 (2006), 2/3, pp. 108–109.

4 For further information about this research project see [<http://www.sfb-repraesentationen.de/teilprojekte/c4/english>].

tudinal ethnographic data over a period of up to ten years. The project aims to »map« reproductive mobilities across European borders (internal as well as external) and to understand reproductive medicine as a tool for making, re-making and re-inventing kinship as a central »organizational apparatus«⁵ of societies to order the social. Kinship in its Euro-American variety produces persons who consider themselves to be a product of nature and culture, as having come into being through »biological« as well as »social« processes: fused gametes merge and recombine generational pasts while love and care, socialization and education guarantee an individual future. Kinship is an imaginary institution of society – as Cornelius Castoriadis defined the term. As an apparatus for producing social forms and orderliness it is leaning »on the natural stratum which is [... conceived as being] internal to society.«⁶ It is imaginary in providing enough vagueness and openness for cultural interpretations of the »facts of nature« and at the same time makes these interpretations invisible through naturalization: social facts appear as natural facts.

Our project comparatively investigates local and national modes of using and appropriating reproductive medicine – what we tentatively call IVF-cultures – in Turkey, Great Britain, and Germany. The research project traces the emerging transnational forms of mobility, competition, inequality, and collaboration in the domain of reproductive medicine. Doing so, we take reproductive medicine to be a prime field-experiment within modern societies, an experiment that challenges existing imaginaries of kinship through affording the manipulation and intervention into the »facts of nature.« We interpret reproductive medicine as an experimental system »in the wild,« not confined to laboratory settings and fertility clinics, that allows the reinterpretation of »social facts,« destabilizing or undermining the conventionally unquestioned naturalization of kinship. But reproductive medicine is also an experiential system, affording new experiences, producing new subjectivities, new objectivities, new moralities, and social obligations. Reproductive medicine thus can also be used as a sort of natural experiment for anthropology: It implements

5 Fredrik Barth, »Analytical Dimensions in the Comparison of Social Organizations«, in: *American Anthropologist* 74 (1972), 1/2, pp. 207–220.

6 Cornelius Castoriadis, *The Imaginary Institution of Society* (London: Polity Press, 1987), p. 230.

tools and concepts in modern societies and introduces an experimental mode of producing biological and social kinships across a diverse number of social and cultural contexts. As reproductive medicine opens up a space for defining and experiencing relations held to be based on »nature« in a new way – be it on the level of individuals, families, or societies – it offers rare analytical opportunities to comparatively observe the remaking of kinship as an imaginary institution and a generator of social orders.

In this book, the idea of reproductive technologies as constituting an experimental set-up is further elaborated. The contributions assembled here use their analyzes of such field experiments not only to look into the contemporary renegotiations of the made and the given, they also provide us with empirical insight into the ambiguous phenomenon of »globalization.« Some of the articles depict reproductive technologies as they are practiced and lived in very diverse settings, not only in Great Britain, Germany and Turkey, but also in Sri Lanka and Mali, in Middle Eastern Countries, India and Spain, in public and private hospitals, families and concerned groups, and along the brim of affluence that separates East and West, North and South. Other contributions chart the mobility of experts, substances, patient-consumers, practitioners, and bioethical discourses across fuzzy terrain or focus on transnational arrangements of ova »donation« or »surrogacy« – often against a grim backdrop of increasing global inequality and depleted agency and control through women. The ensemble of these ethnographic case studies is not so much comparative as such, but rather focuses on the question, how dense and detailed ethnographic knowledge – interactively produced in widely different situations and regions, mobilized by multi-sited research, and reconnected in new forms of research cooperation or in publications such as this – can enhance the understanding of the globalization of biomedical technologies. How can such knowledge invigorate the analysis of global forms? How can ethnographic work contribute to an understanding of global forms as »not simply agglomerations of brief encounters« but structures which develop their own temporalities?⁷ Karin Knorr-Cetina has described global forms as providing »an enhanced environment or laboratory for the study of contemporary extensions and reconfigurations of interaction order prin-

⁷ Karin Knorr Cetina, »The Synthetic Situation: Interactionism for a Global World«, in: *Symbolic Interaction* 32 (2009), 1, pp. 61–87, in particular p. 83.

ciples.« Global forms in her view »define the order of things on which such principles become further articulated and thrive (...).«⁸ By addressing emergent transnational junctions and disjunctions, the uneven global distribution and accessibility of reproductive technologies, and a broad spectrum of localizing articulations from the perspective of ethnography, the contributions demonstrate in how far reproductive technologies can be seen as an experimental set-up for the reconstruction of late modern topologies (see Beck in this volume) and of a contemporarily emerging order of things.

Reproductive Technologies as Global Form

In this volume, reproductive technologies such as in vitro fertilization (IVF), different forms of insemination, intra-cytoplasmic sperm injection (ICSI), so-called »surrogacy« arrangements, and conception via »donated« ova are conceived of *as a global form*. By using this term *we* refer to three distinguishable, but interconnected dimensions. *First*, it is a conceptual move following Aihwa Ong's and Stephen Collier's suggestion to rethink global phenomena beyond notions of mapping, spread and space. It is certainly true that during the last 40 years reproductive technologies have moved at high speed across borders and domains so that they have become increasingly well-known in many parts of the world.⁹ But spatial

8 Loc. cit.

9 Anthropologists have investigated, charted, and in many ways accompanied these developments since the 1990s; for surveys and important landmark volumes see e.g. Marcia C. Inhorn & Daphna Birenbaum-Carmeli, »Assisted Reproductive Technologies and Cultural Change«, in: *Annual Review of Anthropology* 37 (2008), pp. 177–196; Carole H. Browner & Carolyn F. Sargent (Eds.), *Reproduction, Globalization, and the State* (Durham, NC: Duke University Press, 2010); Daphna Birenbaum-Carmeli & Marcia C. Inhorn (Eds.), *Assisting Reproduction, Testing Genes: Global Encounters with New Biotechnologies* (New York and Oxford: Berghahn Books, 2009); Lorraine Culley, Nicky Hudson & Floor B. van Rooij (Eds.), *Ethnicity, Infertility and Reproductive Technologies* (London: Earthscan Books, 2009); Willemijn de Jong & Olga Tkach (Eds.), *Making Bodies, Persons and Families. Normalising Reproductive Technologies in Russia, Switzerland and Germany* (Münster: LIT-Verlag, 2009); Marcia C. Inhorn (Ed.), *Reproductive Disruptions: Gender, Technology, and Biopolitics in the New Millennium* (New York and Oxford: Berghahn Books, 2007); Aditya Bharadwaj (Ed.), »Divine

distribution and spread are only one, and not even one of the most telling features of their globalization. Arjun Appadurai's concept of »scape«¹⁰ has done important work in theorizing the proliferation of global entanglements, of spaces and forms emerging out of continuous acts of border crossing and transnational connections. However, spatially colored concepts such as »scape« tend to define global forms in analogy to relatively coherent spaces, often modeled on the idea of a landscape. They are less helpful for capturing the more discontinuous and schizmo-genetic qualities of these emergent phenomena, the plethora of fissures and countercurrents, in which they are entailed. More to the point and analytically fruitful might be Aihwa Ong's and Stephen Collier's observation that global forms are characterized by a »specific capacity for decontextualization and recontextualization.«¹¹ Because of their standardized features – ranging from cryopreservation protocols, best practice guidelines, ISO-norms, and evidence based medicine to paper technologies, medical statistics, and universal concepts in international bioethics – reproductive technologies travel and arrive in various destinations; but in being reappropriated in different contexts, they also generate new alterities. They are »designed to produce functionally comparable results in disparate domains,«¹² but they also effect a proliferation of differences in working and living with

Intervention and Sacred Conceptions: Religion in the Global Practice of IVF«, special issue of *Culture, Medicine, and Psychiatry* 30 (2006), 4; Maya Unnithan-Kumar (Ed.), *Reproductive Agency, Medicine and the State. Cultural Transformations in Childbearing* (New York and Oxford: Berghahn, 2004); Marcia C. Inhorn & Franz van Balen (Eds.), *Infertility around the Globe. New Thinking on Childlessness, Gender and Reproductive Technologies* (Berkeley and Los Angeles: University of California Press, 2002); Jeanette Edwards, Sarah Franklin, Eric Hirsch, Frances Price & Marilyn Strathern, *Technologies of Procreation: Kinship in the Age of Assisted Conception*, 2nd edition (London: Routledge, 1999); Faye D. Ginsburg & Rayna Rapp (Eds.), *Conceiving the New World Order. The Global Politics of Reproduction* (Berkeley and Los Angeles: University of California Press, 1995).

- 10 Cf. Arjun Appadurai, »Global Ethnoscapes: Notes and Queries for a Transnational Anthropology«, in: *Capturing Anthropology: Working in the Present*, ed. by Richard G. Fox (Santa Fé, NM: School of American Research Press), pp. 191–210. For a more detailed and pronounced discussion of the concept of »scapec« with regard to reproductive technologies see also Inhorn and Hörbst (both in this volume).

- 11 Collier & Ong, »Global Assemblages«, op. cit. (note 3), in particular p. 11.

- 12 Ibid.

these technologies¹³ and generate new constellations and frictions. The contributions to this volume share a common concern to make visible the ways in which reproductive technologies replicate standards and at the same time create differences. By describing this double effect of reproductive technologies as global form in finely grained ethnographic detail they trace the emerging new orders of sameness and difference in the context of their uneven global distribution.

A *second* understanding of reproductive technologies as global form is introduced most elaborately by Sarah Franklin in the opening paper of this book. Franklin chronicles the history and prehistory of in vitro fertilizations and embryo-transfers in animals and humans in order to understand their significance for current and future concepts of »the biological.« »The biological« entails both living matter itself and the biological sciences.¹⁴ Franklin uses the term »global biological«¹⁵ to refer to developments and processes that potentially affect all human beings independent of their concrete involvement, for example, in in vitro technologies. Her analytic angle is genealogical. It was in vitro fertilization, she argues, and not later, more spectacular genetic experiments like Dolly, the sheep, that has fundamentally altered concepts of human reproduction and biological relationships. By explicating how biological facts in general belong to multiple transferable logics and by normalizing technological interventions into human cells and gametes, in vitro fertilization according to Franklin functioned like a precursor for further interventions and subsequent technological developments. In her astute analysis Franklin shows that the most important implications of in vitro technologies for social relations do not consist in their close connection with infertility. Rather, their impact is considerable because they paved the way for a more general acceptance of hybrids, for the culturing of biology in a glass, and for the blending

13 Margaret Lock, Allan Young und Alberto Cambrosio, *Living and Working with the New Medical Technologies: Intersections of Inquiry* (Cambridge: Cambridge University Press, 2000).

14 Sarah Franklin, »Stem Cells R Us: Emergent Life Forms and the Global Biological«, in: *Global Assemblages. Technology, Politics, and Ethics as Anthropological Problems*, ed. by Aihwa Ong & Stephen J. Collier (Malden, MA, and Oxford: Blackwell, 2005), pp. 59–48.; Sarah Franklin, *Dolly Mixtures. The Remaking of Genealogy* (Durham and London: Duke University Press, 2007); Sarah Franklin, »Embryonic Economies: The Double Reproductive Values of Stem Cells«, in: *BioSocieties* 1 (2006), pp. 71–90.

15 Franklin, »Stem Cells R Us«, op. cit. (note 14).

of technology with biology. Reproductive technologies then constitute a global form not so much because they directly affect many involuntarily childless women, men, and couples all over the world, but rather because they introduce »new models of biological relationships among parts as well as wholes« that might matter for all humankind, as Franklin writes in her contribution.

A *third* understanding of reproductive technologies as a global form charted in this volume refers to the ways in which such forms in their diverse localizations, transnational conjunctions and global dimensions directly challenge ethnographic modes of knowledge production. This touches on a problem which has been intensely discussed in contemporary social and cultural anthropology and on which a fair amount of research¹⁶ has already been undertaken and published: What kind of conceptual and methodological innovations are necessary in order to do justice to the complexity of global forms?

The problem has preoccupied social and cultural anthropology for at least two decades now. Conventional concepts of the local, focusing on bounded entities and emphasizing what is shared by members of a certain group, have been just as much criticized as the assumption of a territorial culture, which makes recourse to an a priori congruence of space, language and identity. Meanwhile there is an entire arsenal of terminologies to capture and analyze the increasing entanglement of widely different and remote phenomena and to illuminate the interaction between local diversifications and supra-local influences. Some of these conceptual approaches, like the research on cultural transfers, primarily focus on the aspect of mobilization through such entanglements.¹⁷ A second group of research more strongly focuses on practices and processes of appropriation,

16 See for example Jonathan Xavier Inda & Renato Rosaldo (Eds.), *The Anthropology of Globalization. A Reader* (Malden: Blackwell, 2005); Michael Burawoy, »Introduction: Reaching for the Global«, in: *Global Ethnography. Forces, Connections, and Imaginations in a Postmodern World*, ed. by Michael Burawoy (Berkeley and Los Angeles: University of California Press, 2000), pp. 1–40; Thomas H. Hylland Eriksen (Ed.): *Globalisation – Studies in Anthropology* (London and Sterling, VA: Pluto Press, 2003).

17 Thoma Keller, Kulturtransferforschung, Grenzgänge zwischen den Kulturen. In: *Kultur. Theorien der Gegenwart*, ed. by Stephan Moebius and Dirk Quadflieg (Wiesbaden: VS Verlag für Sozialwissenschaften, 2006), pp. 101–114.

acculturation, and enculturation.¹⁸ A third approach tries to conceptualize the results of continuous exchange with respect to the transformations of the social and cultural fabric: here transculturation, syncretism, hybridization, and creolization figure as key themes.¹⁹ Most of these concepts imply a more or less extensive theoretical reflection about the simultaneous production of localizations and transnational connections and the emergence of global patterns/orders and problems.

The present volume is especially concerned with the methodological path an anthropology of global forms can choose and with the specific knowledge it produces. In recent years, perhaps the most influential attempt to introduce a new dynamic into contemporary ethnography has been George Marcus' program of »multi-sited« research.²⁰ However, the great success of this program by now has led to an overemphasis on mobility and on the spatial aspects of emerging patterns/orders. In contrast, as early as the 1990s Marilyn Strathern already stressed that it was of minor importance whether researchers did enter their field at one particular site only, whether they placed themselves in multiple sites, whether they kept themselves permanently mobile and followed their topics and subjects or whether they entered the field via online communication and with the help of their laptop.²¹ According to Strathern, the crucial axis of difference and distinction nowadays is in time rather than space. What distinguishes

18 For a survey on ideas of »entering or growing into« another society, group or culture from the point of view of historical anthropology see Peter Burke, *Cultural Hybridity* (Oxford: Polity Press, 2009), in particular p. 9–40; Gerd Baumann, Riva Kastoryano, Werner Schiffauer & Stephen Vertovec have described »enculturation« as a »dynamic process of growing into« society as opposed to »acculturation« and »integration«, which they both see as tainted by ideas of assimilation; cf. Werner Schiffauer et al., *Civil Enculturation: Nation-State, Schools and Ethnic Difference in Four European Countries* (New York and Oxford, 2004).

19 For an overview see Phillipp W. Stockhammer (Eds.): *Conceptualizing Cultural Hybridization. A Transdisciplinary Approach* (Heidelberg: Springer, 2009).

20 George Marcus, »Ethnography in/of the World System: The Emergence of Multi-Sited Ethnography«, in: *Annual Review of Anthropology* 24 (1995), pp. 95–117; James D. Faubion & George E. Marcus (Eds.), *Fieldwork Is Not What It Used to Be. Learning Anthropology's Method in a Time of Transition* (Ithaca and London: Cornell University Press; 2009).

21 Marilyn Strathern, »The Ethnographic Effect I«, in: *Property, Substance and Effect. Anthropological Essays on Persons and Things* (London and New Brunswick, NJ: The Athlone Press), pp. 1–26, in particular p. 1.

the ethnographic moment from other ways of knowledge production is the idea of »immersion,« and immersion needs time.²² The specific facility of ethnography is, that it is a »method for ›finding‹ the unlooked for.«²³ Attempts to update the program of »extended case studies,« developed by Max Gluckman and the Manchester School, focus on the temporal dynamics of translocal orders and try serial ethnography by »following cases over extended periods of time.«²⁴ Like restudies, such experiments with recurrent forms of participant observation are methodologically concerned with capturing gradual change and the long-term development of global assemblages. Some of the contributors to this volume use a modified form of serial ethnography in analyzing the development of reproductive technologies in different settings over a time of several years – either systematically or in a more »opportunistic« way. Apart from the dimensions of time and space of field-sites many contributions have been inspired by the proposals of James Clifford and Anna Tsing, to conceptualize ethnographic sites as places of encounter²⁵ and emergent contact zones²⁶. Finally, the problem of how ethnography should research global forms like reproductive technologies can also be tackled by developing new forms of cooperation – this at least was one of the topics that very much concerned us during the workshop »IVF as Global Form. Ethnographic Knowledge and the Transnationalization of Reproductive Technologies,« which took place at Humboldt-University, Berlin in 2008 and which was the departure for this book. How can we design forms of international cooperation that will allow ethnographers of emergent global forms to in-

22 Loc. cit.

23 Ibid., p. 3.

24 Cf. Max Gluckman: *Analysis of a Social Situation in Modern Zululand* (Manchester: Manchester University Press, 1958); Michael Burawoy, *The Extended Case Method and Theoretical Tradition. Four Countries, Four Decades, Four Great Transformations* (Berkeley and Los Angeles: University of California Press, 2009), T.M.S. Evens & Don Handelman, *The Manchester School. Practice and Ethnographic Practice in Anthropology* (New York and Oxford: Berghahn, 2006).

25 Anna Lowenhaupt Tsing, »Conclusion: The Global Situation«, in: *The Anthropology of Globalization. A Reader*, ed. by Jonathan Xavier Inda & Renato Rosaldo (Malden, MA: Blackwell), pp. 453–486; Anna Lowenhaupt Tsing, *Friction. An Ethnography of Global Connection* (Princeton, Oxford: Princeton University Press, 2005).

26 James Clifford: *Routes. Travel and Translation in the Late Twentieth Century* (Cambridge, MA and London: Harvard University Press, 1997).

creasingly share and jointly analyze data without limiting the openness and process orientation so essential for anthropological research by a premature fixation on certain topics and approaches? How can positioned and partial insights of particular ethnographers be coordinated without totalizing claims? And how can new types of team research and cross-border collaborations be established within and across existing academic research structures?²⁷

Practice, Knowledge and Transnational Encounters

The ethnographies brought together in this collection analyze local articulations as well as transnational entanglements of reproductive medicine; and they raise questions about the emergence and tentative stabilization of global forms. They ask how reproductive technologies are related to aspirations and ideas of Western and other modernities and demonstrate how they contribute to the reproduction or renewed constitution of boundaries of knowledge, agency, access and distinction. Rather than simply demonstrating diversity these case studies work towards a broader contextualizing of reproductive medicine and try to interrogate perspectives on unwanted childlessness concerning their entanglements with topics like abortion, demographic policies, gender, power relations, legal regimes, and economic conditions.

The chapters in the first section, *Localizing In Vitro Fertilization: The Cultural Work of Encounters with Medical Technologies*, explore the production of differences²⁸ by closely focusing on the actual work of localization. Instead of starting with a dichotomous view on global force and local response²⁹ they seek to trace the coproduction of the local and the translocal, of in vitro technologies and societies in diverse settings. Following Anna

27 Cf. Matsutake Worlds Research Group, »A New Form of Collaboration in Cultural Anthropology: Matsutake Worlds«, in: *American Ethnologist* 36 (2009), 29, pp. 380–403.

28 Akhil Gupta & James Ferguson, »Beyond culture: Space, identity, and the politics of difference«, in: *Cultural Anthropology* 7 (1992), 1, pp. 6–23.

29 Tsing, »The Global Situation«, op. cit. (note 25), p. 472.

Tsing's suggestion to carve out »the cultural work of encounters,«³⁰ they detail the emergence of »national« IVF cultures developing out of localized interactions with reproductive technologies.

Bob Simpson chronicles the arrival and dissemination of IVF since the late 1990s in Sri Lanka, a country riddled by political conflict, where regulation of in vitro technologies is weak, public attention limited, and access is restricted to a small elite. Focusing on practitioners in reproductive medicine and ethicists, Simpson reconstructs the struggles entailed in cultivating a »nationally appropriate« regulation of reproductive technologies. It must be compatible to local sensibilities and socialities and at the same time capable of demonstrating the country's participation in global scientific advance. Like Simpson, Zeynep B. Gürtin focuses on the localizing work done by professionals but her research is situated within the developed and flowering Turkish IVF sector. Gürtin portrays practitioners as interface agents simultaneously committed to negotiating local as well as transnational credibility. She particularly shows how constant practices of comparing, of defining and assigning variability and sameness are contributing to the establishment of something like »Turkish IVF,« which is simultaneously seen as »same as« and »very distinct from« global IVF forms elsewhere. Maren Klotz's contribution takes a double perspective on how families-by-sperm-donation in Germany make and maintain (transnational) connections and how her own research is implicated in this. Here, the analytical strategy centers on the complex connections between the regulation of reproductive technologies and the reflexive practices and experiences of actors in the field. Klotz raises the issue how contemporary practices of anonymous donation might be threatened by what she calls the »convergence between telecommunication or IT-based networks and kinship.« This convergence potentially undermines anonymity by making kinship knowledge »uncontainable.«

Contributions to Part II, *National Styles of Reproductive Governance and Global Forms*, focus on different styles of reproductive governance emerging out of the interaction with assisting reproductive technologies as global form. Aditya Bharadwaj points to the lack of theoretical work and critical research about transnational surrogate motherhood in India. He combines a historical perspective on sexual genealogies and gendered

30 Tsing, »Friction«, op. cit. (note 25), pp. 1–18.

asymmetries with a political anthropology of the involvement of the state. His contribution offers new interpretations of what it means to be »the other mother« in transnational surrogacy today. Viola Hörbst provides a detailed case study of the local and transnational articulation of assisting reproductive technologies in Mali, one of the poorest nations in the world. There, a limited array of reproductive technologies is available for a small urban, often transnationally oriented, elite only. Her work chronicles how the local governance of reproductive technologies in Mali is deeply entangled with trans- and international reproductive institutions. These center on poverty, high Malian birth rates, the dangers of »overpopulation« and development; leaving almost no space for a political awareness of the plights of the involuntary childless. Equally targeting the conjunctions of transnational institutions and local subjectivities and agencies, Nurhak Polat presents results from her ethnographic study of a concerned group of patient-consumers in and around Istanbul. Her perspective on this new actor in the field of reproductive governance is particularly concerned with the knowledge practices of this group and their narrative, economical, and political interventions in regulation, markets, and medical practice.

Transnational Reproductive Mobilities und Figurations

Whereas the chapters in Part I and II of this volume are more concerned with the localizing pole of global forms, contributions to Part III and IV give their empirical and theoretical attention to transnational entanglements and reproductive mobility. Ethnographic research along the routes of reproductive travel – of users and practitioners, standards and equipment, hormones and other bodily substances – or within transnational clusters of intensified clinical cooperation in infertility treatment has been taken up only recently. Six essays in this volume empirically investigate transnational reproductive mobilities and figurations in different world regions. Their dynamics and structures are not easily mapped and cannot be explained by center and periphery patterns alone. In Section III, *Tracing Transnational Scapes of Reproductive Technologies: Emergent Forms and Domains of Regulation*, Marcia Inhorn introduces the Middle East as

a »key site for understanding current intersections of technoscience, religious morality, and modernity.« Focusing on the experiences and movements of involuntarily childless couples from a number of Middle Eastern states, Inhorn provides an analysis of the complex legal topography of bans on third-party gamete donation in Sunni Muslim-majority countries and on the permission of donor technologies in Shia Muslim-majority countries, particularly in Iran and Lebanon. This constellation has considerably intensified transnational reproductive mobility across the Middle East. Eva Maria Knoll charts in a similar way the border crossing activities and grey zones generated by the national ban on egg donation in Austria and follows women and couples in search of female gametes to Hungary. Under-regulation, half-hearted firewalls drawn up against the commercialization of human ova or embryos and a certain degree of elbowroom have made available very different, sometimes antagonistic policies and practices in three researched Hungarian IVF-clinics. Maren Klotz and Michi Knecht in their joint contribution focus on the unintended consequences of the implementation of the EU-tissue directive – a transnational piece of regulation – in a German sperm bank in 2007. Their case study is concerned with a conceptual rethinking of the ethnography of Europeanization as an exemplary transnational process and with the way in which not only laws, but also standards and often neglected infrastructural details have far reaching effects on how reproductive technologies allow to do kinship.

Section IV, *Transnational Reproductive Mobilities, Materialities and Agencies*, continues the exploration of transnational reproductive mobilities and figurations, but foregrounds reflections on research practice and politics, analytical tools and conceptual questions. Michal Nahman opens this part of the volume with a case study situated in an Israeli ova extraction clinic in Romania. Difficult encounters, antagonistic aspirations of clinic operators, young Romanian ova sellers and Israeli ova recipients, and the awareness of conflicting ethical regimes – global forms of their own – all prompt questions on the politics of (public) anthropology in such a setting. They also raise questions on the possibilities and potentials of ethnographic knowledge as a contribution to the situation itself. In his analysis of reproductive mobility at fertility clinics in Spain and the Czech Republic, Sven Bergmann points to emerging transnational »cultures of

disguise« and the practices of anonymity and fabricating resemblance, that are connected with them. Again taking the trade in egg cells as ethnographic example, he analyzes matching strategies, synchronization practices, and the production and safeguarding of supply and demand in situations of starkly-stratified transnational interaction and encounter.

In the final contribution to this volume, Stefan Beck reconstructs the reflexive practices of diverse actors that generate the transnational spaces of reproductive technologies and a new *body cosmo-politic*. Taking as his examples a Cypriot patient organization, and different forms of collaboration and *knowledge-franchising* between Turkish clinics and their international partners, Beck in his descriptions and interpretations experiments with a vocabulary that no longer takes nation states as blueprint for the analysis of transnational conjunctures and global forms.

Outlook

The articles brought together in this volume demonstrate the strength of ethnographic accounts to analyze the diverse local articulations as well as the transnational entanglements of reproductive medicine. In vitro-fertilization and other related medical technologies like for instance the biobanking of gametes, pre-implantation genetic diagnosis etc. together constitute a global form, an assemblage of knowledge and technologies that is enacted in quite diverse social and cultural contexts; that is used by a range of actors for quite divergent purposes; and that raises different questions for different actors. Reproductive technologies have challenged kinship as a central »imaginary institution« of Western and non-Western modernities alike – and they will do so in the near future as new technologies and procedures will be developed and be made available on a global scale. The task of anthropology will not simply be to demonstrate that reproductive medicine is implemented and put to use quite differently in diverse socio-cultural contexts, but to use this field-experiment to inquire how demographic policies, gender- and power-relations, legal regimes, and economic conditions shape and are shaped by this global form.

Five Million Miracle Babies Later: The Biocultural Legacies of IVF

Sarah Franklin

Introduction

Accompanying the birth of approximately five million babies worldwide through IVF over the past 30 years, in what is arguably one of the largest human reproductive experiments ever undertaken, has been the ongoing effort to understand and characterize the biocultural legacies of this technique's success »in man.«¹ The effort to understand these legacies traverses a range of disciplines – from politics and ethics to anthropology and economics – and this volume represents a significant contribution to the documentation of IVF's global proliferation and diversification. The question of what it means to be »after IVF« has at least two different meanings. One is historical: humanity now exists after the fact of successful human IVF (since 1978 or 1969, depending on whether IVF is taken to refer to the fertilization of a human egg or the birth of viable human offspring). This new biological fact of human existence is now part of the human condition, a »fact of life.« A second sense of »after« describes the somewhat more complicated project of re-engineering human biological futures that is now to a certain extent modeled on IVF. The question here is one of style: to what extent are biological systems increasingly refashioned and restyled »after« IVF, in the sense that IVF »modeled« a technologically assisted *in vitro* replica of conception that became at once synonymous with and different from »the real thing«?² This could be called life's imitation

1 This chapter is a rewritten version of the keynote address to the conference on which this volume is based. My thanks to the organizers of this event and the editors of this volume who very kindly invited me to participate in both projects.

2 Perhaps one of the most dramatic examples of this modelling effect is the extent to which earth is compared to a microorganism in the work of prominent climate change theorists such as James Lovelock, whose Gaia model is closely based on the symbi-

of life, and effects its doubling, or supplementation, as life and »biolife.« If one of the most revolutionary features of IVF, paradoxically, is how unremarkable this form of bespoke human life has become in the relatively short period of three decades since its highly controversial debut in Greater Manchester, what does this tell us about the cultural status of biological facts more broadly – indeed the »facts of life,« or »biolife« – that are newly modeled upon, and literally reproduced through, human in vitro culture systems? Arguably one of the possibilities this rapid normalization of IVF suggests about the future of biological control is that *the fusion of biology and technological control* has somewhat ironically »naturalized« a condition we could describe as that of being *biologically relative*. Increasingly, the biological exists *relative to* technological control. And this, in turn, has become a condition that throws into question what »human biology« refers to »itself.«³

A biocultural history of IVF enables us to engage these questions empirically, as well as ethically and politically. Such a history must consider the genealogical legacies of IVF in the double sense of »genealogical«: how we inherit them in direct, or proximate, historical time, and in the more diffuse Foucauldian sense of the often paradoxical unfolding of interwoven events that opposes singular or ultimate origins.⁴ It is the combination

otic theories of evolution of the microbiologist Lynn Margulis. »Re-engineering« the earth's future survival along the lines of the positive and negative feedback systems and loops proposed by Lovelock, among others, epitomizes the »earth as a Petri dish« model that constitutes the paradigm of biolife. See James E. Lovelock & Lynn Margulis, »Atmospheric Homeostasis by and for the Biosphere: The Gaia Hypothesis«, in: *Tellus*, 26 (1974), 1/2, pp. 2–10; Lynn Margulis & James Lovelock, »Biological Modulation of the Earth's Atmosphere« in: *Icarus* 21 (1974), 4, pp. 471–489.

3 In respect of Foucault's (1973) famous declaration that life »itself« was only conceivable as a result of the emergence of modern biology (»itself« in turn the result of the emergence of the evolutionary view of life's emergence), we might, in the wake of cloning and the human genome project, now argue that there is no such thing as either life »itself« or biology »itself.« Both life and biology are now analyzed under a looser set of definitions, closely bound up with technology, in a manner closer to their classical enunciation as *physis* – as physical form – or as chemistry. We might say, for example, that all of life is the same as »chemistry itself« – except that this does not really say anything. Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences* (New York: Vintage, 1973).

4 Foucault was particularly interested in genealogy as a means of tracing power, or power as it constituted subjects. He was also concerned to provide a history for elements of

of these two that I refer to as the »thick genealogies« of biotechnical innovation.⁵ In this sense, IVF itself can be analyzed as a »culture medium« – a continuous history of biotechnical innovation that derives from deliberate human intention, but which also changes the terms of such aspirations, as it also changes the conditions of human life.⁶ This approach enables us to examine the histories that have helped to shape human IVF and their dialectical relationship to the post-IVF imaginaries that in turn have reconstituted reproductive hopes and reproductive choices, while giving birth to new reproductive technologies and transforming the science of reproductive biology.⁷ A question we might prioritize is what the history of IVF in both animals and humans can tell us about the changing meanings of biological reproduction, reproductive biology, or the biological more

human life that are often imagined as ahistorical, such as sexuality or biology. Reproduction, of course, fits into this model very »naturally.«

5 Sarah Franklin, *Dolly Mixtures: The Remaking of Genealogy* (Durham, NC: Duke University Press, 2007).

6 In contrast to the presumption in much 20th century philosophy that *techné* exists in tension with humanity (e.g. Heidegger, Habermas, Marcuse, or Arendt), anthropological accounts of technology more closely resemble the tradition established through Marx and Engels, according to which humans both shape and are shaped by their tools – dialectally; see Frederick Engels, »The Part Played by Labour in the Transition from Ape to Man«, in: *Selected Works, Karl Marx and Frederick Engels* (Volume 2) (Moscow: Foreign Language Publishing House, 1962). This is also the approach developed out of the material structuralism of the French anthropologist Leroi-Gourhan that is continued in the work of Derrida, among others. For anthropologists such as Malinowski, tools were interpreted in the Maussian tradition – as »total social facts.« A slightly different approach was developed by the pioneering feminist Shulamith Firestone, whose enthusiastic technofuturism drew in no small part on the example set by the British socialist biofuturists of the interwar period, such as Haldane, Huxley, and Waddington, see Sarah Franklin, »Revisiting Reprotech: Firestone and the Question of Technology«, in: *Further Adventures of the Dialectic of Sex: Critical Essays on Shulamith Firestone*, ed. by Mandy Merck & Stella Stanford (London: Palgrave, 2010), pp. 29–60. One question motivating this chapter is what it means for a human embryo to become a tool.

7 An interesting example in this context is the argument made by eco-futurist Stewart Brand, founder of the *Whole Earth Catalogue*, who suggested to the Financial Times in an interview about his recent book, *Whole Earth Discipline*, that IVF was a good model for the beneficence of technological engineering solutions applied to the most elementary processes of biology and biochemistry. See Stewart Brand, *Whole Earth Discipline: An Ecopragmatist Manifesto* (London: Viking, 2009); Stewart Brand, »Lunch with the FT«, interviewed by David Honigsmann, in: *Financial Times*, 8 January 2010.

widely. What kinds of future imaginaries engender, or are evoked by, the increasing number of technologies through which reproduction is variously assisted and remade?⁸

The IVF Platform

An example of how the history of IVF unfolds into the present is its new interface with stem cell research.⁹ Over the course of its development in mammals, the IVF technique gradually evolved from an experimental scientific method into a variety of clinical and agricultural applications.¹⁰ Since its successful translation into human clinical medicine in 1978, IVF has similarly undergone a rapid evolution as a platform for newer techniques such as intracytoplasmic sperm injection (ICSI) and preimplantation genetic diagnosis (PGD). The vast increase in the scale of human IVF now undertaken worldwide, combined with the ease of cryopreservation and storage of fertilized eggs, embryos, and blastocysts, means that IVF has

8 See, for example, Adele Clarke's pioneering work *Disciplining Reproduction*, in which she charts the emergence of reproductive biology and »the problems of sex« in the 20th century. Adele E. Clarke, *Disciplining Reproduction: American Life Sciences and »The Problems of Sex«* (Berkeley: University of California Press, 1998). See also Hannah Landecker, *How Cells Became Technologies* (Cambridge, MA: Harvard University Press, 2006).

9 Sarah Franklin, »The Cyborg Embryo: Our Path to Transbiology«, in: *Theory, Culture and Society* 23 (2006a), 7/8, pp. 167–188; Sarah Franklin, »The IVF-Stem Cell Interface«, in: *International Journal of Surgery* 4 (2006), 2, pp. 86–90.

10 For useful histories of IVF, see John D. Biggers, »In Vitro Fertilization and Embryo Transfer in Historical Perspective«, in: *In Vitro Fertilization and Embryo Transfer*, ed. by Alan O. Trounson & Carl Wood (London: Churchill Livingstone, 1984), pp. 3–15; Jack Challoner, *The Baby Makers: The History of Artificial Conception* (London: Macmillan, 1999); Robert G. Edwards, »The Bumpy Road to Human In Vitro Fertilization«, in: *Nature Medicine* 7 (2001), 10, pp. 1091–1094; Simon Fishel & Edward M. Symonds (Eds.), *In Vitro Fertilisation: Past, Present, Future* (Oxford: IRL Press, 1986); or Robin M. Henig, *Pandora's Baby: How the First Test Tube Babies Sparked the Reproductive Revolution* (Boston, Houghton Mifflin, 2004). For useful feminist histories see Clarke, »Disciplining Reproduction«, op. cit. (note 8); Gena Corea, *The Mother Machine: Reproductive Technologies from Artificial Insemination to Artificial Wombs* (New York: Harper & Row, 1985); or Naomi Pfeffer, *The Stork and the Syringe: A Political History of Reproductive Medicine* (Cambridge: Polity, 1993).

become intimately linked with the futures of stem cell research, tissue engineering, and regenerative medicine. In sum, the IVF industry generates what is now called »the embryo supply« or more specifically »the population« of research embryos, the preservation, governance, use, and handling of which has required the development of new forms of biological control and quality control that are deemed necessary for the manufacture of safe, reliable, and ethical human cell-based products.¹¹ Without IVF, human embryonic stem cell (hES) research would be impossible, and the new epigenetic understandings of basic cellular processes that are central to these fields, such as imprinting, reprogramming, methylation, and dedifferentiation, could not be studied (»in man«) during the crucial early embryonic stages of development when they are most accessible experimentally (*in vitro*). Retaining a lead at the bioknowledge horizons of this high-profile research frontier is a major economic priority of both the UK government and the EU, especially with the US doubly hampered by Right-to-Life and controversies over patenting and intellectual property.¹²

In the UK the strong government push to accelerate hES derivation is evident in a new generation of specialized labs that have been commissioned and built over the past 5 years. They are designed to facilitate the most efficient, economical, and ethically robust use of human research embryos produced in the UK. These new labs embody the goal of enhancing UK hES derivation, banking, and standardization, with a view to establishing a new source of »life stock,« or biolife, that promises, in the neoliberal parlance of successive governments, »substantial health and wealth deliverables« for future Britons and their offspring.

I visited the largest and most state-of-the-art of these new laboratories at Guy's Hospital in London in the autumn of 2008 with three of my research colleagues. Professor Peter Braude, a consultant obstetrician, ge-

11 Sarah Franklin, »Embryonic Economies: The Double Reproductive Value of Stem Cells«, in: *Biosocieties* 1 (2006c), 1, pp. 71–90.

12 For an international perspective on the stem cell debate see Ingrid Geesink, Barbara Prainsack, & Sarah Franklin (Eds.), *Science as Culture Special Issue: Stem Cell Stories 1998–2008* 17 (2008), 1; Barbara Prainsack, Ingrid Geesink & Sarah Franklin (Eds.), *Science as Culture Special Issue: Stem Cell Technologies 1998–2008* 17 (2008), 4; and Herman Gottweis, Brian Salter & Catherine Waldby, *The Global Politics of Human Embryonic Stem Cell Science: Regenerative Medicine in Transition* (London: Palgrave, 2009).

neticist, and head of the lab, led the tour. The timing was ideal because the lab was just beginning the process of decontamination. So we could see everything and wander round freely without wearing bunny suits and masks. Peter's is the largest of seven new UK labs that have been constructed with government funding to bring IVF and human embryonic stem cell derivation physically closer together, so that any spare or clinically useless embryos can go straight into a quality controlled cleanroom laboratory if a couple decides to donate them to research (which approximately 70% of those asked in the UK will be likely to do). The new labs are thus designed to join together a so-called »dirty« surgical room, where eggs are aspirated from women patients undergoing IVF, with a »clean« laboratory that complies with the highest quality standards of sterility. The two rooms are separated by a hatch, or hole in the wall. The eggs go through the hatch to be fertilized, and, if they grow and develop normally, one of them returns through the door to be transferred into the uterus of a woman IVF patient. Other fertilized eggs or embryos can be frozen for future use, donated to other couples for treatment, donated to research, or disposed of, depending on what the IVF patients decide to do with them.

The new labs offer a path forward – in the current idiom of scientific innovation they represent the cutting edge of *biomedical translation*. What the Food and Drug Administration (FDA) denominates as »the critical path« is the path to application (now known as translation) and thus not only a movement »from bench to bedside« but »from bench to market.« The labs manifest this ambition as a bespoke, purpose-built architecture to facilitate more efficient use of the embryo supply by creating a direct interface between IVF clinics (or Assisted Reproductive Technology, ART) and hES derivation, storage, and banking. They establish a new state of ART. At the IVF-stem cell interface is a new form of passaging human gametes and embryos, not only from one dish to another or even from one room to the next, but from a specific clinical context (a patient having treatment in a surgery) to a new biological order of things (quality controlled facilities that can be process-validated for the safe handling of human cell-based products – a.k.a. the future production of clean and certified human cell-based biological products). This form of propagating human cells represents the latest evolution of the IVF platform – broadly

speaking it enables IVF to become a source of embryo supply for regenerative medicine.

Embryo Movements

What I realized as I investigated the embryo transfers through the hatch at the IVF-stem cell interface was that this interface is not as new as it seemed. IVF and stem cell research come from the same stable, and the story of their co-culture is a well-established theme in historical accounts by scientists active in these fields.¹³ Although novel, the transfer of eggs and embryos through the hole in the wall of the cleanroom is only the latest extension to a chain of embryo transfers that define the origins not only of IVF and stem cell research, but experimental embryology and the study of biological development – especially in the late 20th century, especially in mammals, and especially in the British Isles.¹⁴

These egg and embryo movements, or transfers, have been a staple technique of reproductive and developmental biology since the late 19th century, and their practical applications in livestock breeding have had enormous consequences for world agriculture as well as zoological conservation (especially in combination with cryopreservation). Indeed, one of the simplest means of tracking the history of IVF is by tracing the extension of these transfers from animals into humans – or indeed by considering IVF itself as a »critical path« of embryological knowledge transfer. In other words, IVF was the translational bridge that enabled ET to make its »human turn« – initially as a means of redressing the burden of human reproductive and developmental deficits, later for stem cell research, and now for regenerative medicine. The ET of »IVF and ET,« which is used to describe the surgical transfer of an embryo into an IVF patient's uterus, belongs to a long lineage of related, or ancestral, embryo transfers extend-

13 Cf. Edwards, »The Bumpy Road«, op. cit. (note 10).

14 Chris Graham, »Mammalian Development in the UK (1950–1995)«, in: *International Journal of Developmental Biology* 44 (2000), pp. 51–55. For an important cultural history of this British interest in »babies in bottles« see Susan M. Squier, *Babies in Bottles: Twentieth-Century Visions of Reproductive Technology* (New Brunswick, NJ: Rutgers University Press, 1994).

ing back at least a century.¹⁵ Today, human embryo transfer belongs to an expanding global diaspora of reproductive trafficking, or »tourism«¹⁶ as well as to networks of international scientific exchanges, commercial transactions for research eggs and embryos, and biobanking.¹⁷

This global movement of embryos is part of a dialectic of translation through which new knowledges generate new applications, and vice versa. IVF and ET epitomize this process, having an equally robust importance on both sides of the »pure« and »applied« domains of the biological sciences. As I argued in my previous work on cloning, embryo exchanges continue to cement clinical-scientific collaborations in the busily expanding bioscientific present, just as they have done historically by facilitating mutually beneficial veterinary-scientific and agro-scientific partnerships (such as those uniting Britain and Australia in livestock breeding).¹⁸ At work propelling embryos through the doors of the new labs at the IVF-stem cell interface, then, are historically well-established goals of maximizing efficiency through cooperation, promoting economic growth, exchanging scientific knowledge and materials, and generating technological progress as well as »paybacks« to the general public (who funds much of the research). The new labs express the intention to rationalize the thousands of transfers of research embryos all over the UK, to standardize and validate

15 Cf. Keith J. Betteridge, »An Historical Look at Embryo Transfer«, in: *Reproduction and Fertility* 62 (1981), pp. 1–13; Keith J. Betteridge, »A History of Farm Animal Embryo Transfer and Some Associated Techniques«, in: *Animal Production Science* 79 (2003), 3, pp.203–244; or Biggers, »In vitro fertilization and Embryo Transfer«, op. cit. (note 10).

16 See contributions by Sven Bergmann, Marcia Inhorn and Michal Nahman in this volume.

17 This practice, which conjoins modern transportation with culture and cryopreservation methods to enable a complex worldwide trade in human germplasm, extends the long history of livestock egg and embryo transfers, some of which as early as the 1950s were co-sponsored by commercial airlines such as TWA. The airline industry also features prominently in the online video promoting the American Embryo Transfer Association and its goal of »Global Genetic Improvement through Embryo Technology« (www.aeta.org).

18 Franklin, »Dolly Mixtures«, op. cit. (note 5); Sarah Franklin, »Crook Pipettes: Anglo-Australian Exchanges in Embryology«, in: *Journal of the History of Biology*, Special Issue, ed. by Sarah Wilmot, »From Farm to Clinic«, December (2007); Ian Wilmut, Keith Campbell & Colin Tudge, *Second Creation: Dolly and the Age of Biological Control* (London: Headline, 2000).

procedures, to increase biosecurity and ethical oversight, and eventually to remunerate the British population through »health and wealth gains« in the future.

Although the new labs facilitate more proximate transfers of IVF embryos directly into stem cell research, they are also embedded in a larger system of national embryo exchanges reflecting the specialist expertise in different research centers. Thus, in a complex national choreography of embryo movements, Manchester sends its »failed to fertilize« embryos to Edinburgh, while Leeds sends its past-their-shelflife frozen and research-consented embryos to York. London sends others to Cambridge, which also collects up unused local embryos when they are available. It may well be that a distinctively new type of transfer occurs when the human embryo is passed through the hole in the wall, or the hatch, from the »dirty« IVF surgery into the cleanroom, with quality control and graded air.¹⁹ But it was only after several years of studying the future of these transfers, and the expansion of the IVF-stem cell interface through new labs such as the one in London, that I began to realize that embryo transfer is the signature theme, and conduit, of a much longer history.

In other words, the new future-oriented embryo transfer involved in the passage from the dirty surgery into the clean derivation laboratory at the IVF-stem cell interface is the offspring of a complex genealogy of kindred embryo transfers stretching back more than a century to the first, and most famous, transfer of mammalian reproductive cells – that of Walter Heape, who transferred eggs from one rabbit to another in 1890 to determine the influence of uterine foster mothers on the genetic constitution of their offspring.²⁰ Embryo transfer is both a core idiom and a basic experimental method in the medical, scientific, and agricultural lineages to which contemporary human IVF and its stem cell interface are heir. As

19 See Franklin, »The Cyborg Embryo«, op. cit. (note 9); Franklin, »The IVF-Stem Cell Interface«, op. cit. (note 9); Franklin, »Embryonic Economies«, op. cit. (note 11).

20 For a review of the history of embryo transfer in light of the work of Walter Heape, see Biggers, »In vitro fertilization and Embryo Transfer«, op. cit. (note 10). See also Betteridge, »An Historical Look«, op. cit. (note 15) or Betteridge, »A History of Farm Animal Embryo Transfers«, op. cit. (note 15). For the original procedure, see Walter Heape, »Preliminary Note on the Transplantation and Growth of Mammalian Ova within a Uterine Foster Mother«, in: *Proceedings of the Royal Society* 48 (1891), pp. 457–458.

a consequence, and crucially, embryo transfer is both a way of knowing and an output, a product and an application, a technique and a world-view. What is important about »IVF and Embryo Transfer« is that, like nuclear transfer, it fuses research technique, proof, experimental material, knowledge generation, and application not only with the reproductive process itself (which becomes both a tool and an outcome, or »deliverable«) but with a new, aspirational (sic.) ethos of reproductive control and improvement – whereby the control, the improvement, and the reproductive process »itself« become impossible to separate. This is the fusion which IVF epitomizes.

The IVF Synechdoche

In pursuing the genealogical question of how the biocultural history of IVF is linked to its future, it is important to point out that although this question can be described as understudied, there are notable exceptions. Feminists and anthropologists were among the first to provide empirical and theoretical accounts exploring how we might reckon the forms of cultural change associated with the dawn of the *in vitro* human embryo – itself, of course, a product of improved culture medium.²¹ Among the

21 The prescient work of Shulamith Firestone deserves special mention: Shulamith Firestone, *The Dialectic of Sex: The Case for Feminist Revolution* (New York: Bantam, 1970); or see Franklin, »Revisiting Reprotech«, op. cit. (note 6). For early feminist accounts of IVF, see Rita Arditti, Renate Duelli Klein & Shelley Minden (Eds.), *Test-Tube Women: What Future for Motherhood?* (London: Pandora, 1984); Lynda Birke, Susan Himmelweit & G. Vines, *Tomorrow's Child: Reproductive Technologies in the 90s* (London: Virago, 1990); Corea, »The Mother Machine«, op. cit. (note 10); Christine Crowe, »Women Want It: In Vitro Fertilisation and Women's Motivations for Participation«, in: *Women's Studies International Forum* 8 (1985), pp. 547–552; Renate Klein, *Infertility: Women Speak Out About their Experiences of Reproductive Medicine* (London: Pandora, 1989); Lene Koch, »IVF – An Irrational Choice?«, in: *Reproductive and Genetic Engineering* 3 (1990), pp. 225–232; Maria Mies, »Why Do We Need All This?: A Call Against Genetic Engineering and Reproductive Technology«, in: *Women's Studies International Forum* 8 (1985), 6, pp. 553–560; Barbara Katz Rothman, *The Tentative Pregnancy: How Amniocentesis Changes the Experience of Motherhood* (New York: Norton, 1986); Margarete Sandelowski, »Women's Experience of Infertility«, in: *Journal of Nursing Scholarship* (1986); Margarete Sandelowski, »Fault

most prominent scholars to have considered this topic is Marilyn Strathern, who argued in the early 1990s that the most significant legacy of IVF is a *new reproductive model* in which »the natural facts« of sexual reproduction are understood as *engineerable, replaceable, and intervenable*.²² Strathern argued this new understanding of conception affected the ability of natural facts to operate as a »grounding function« for other meanings. IVF thus not only altered the facts of life, it altered the way a naturalized model of the facts of life could establish a context, a background, or a »before« for the social. Indeed, the way in which nature provides a model for context is arguably one of the things that has been changed »after IVF.«²³

Especially in the wake of cloning, stem cells, and the human genome project, as we enter the »age of biology« in the wake of what has been called »biology's big bang,« it sometimes seems that the importance of IVF as a new model of biological facts has been overshadowed by the cloning

Lines: Infertility and Imperilled Sisterhood«, in: *Feminist Studies* 16 (1990), 1, pp. 33–51; Margaret Sandelowski »Compelled to Try: the Never-Enough Quality of Reproductive Technology«, in: *Medical Anthropology Quarterly* 5 (1991), 1, pp. 29–47; Margaret Sandelowski, *With Child In Mind: Studies of the Personal Encounter With Infertility* (Philadelphia: University of Pennsylvania Press, 1993); Patricia Spallone & Deborah Lynn Steinberg (Eds.), *Made to Order: The Myth of Reproductive and Genetic Progress* (London: Pergamon, 1987); and Michelle Stanworth (Ed.), *Reproductive Technologies: Gender, Motherhood and Medicine* (Cambridge: Polity, 1987). For a summary of feminist monographs on IVF see Sarah Franklin & Maureen McNeil, »Reproductive Futures: Recent Literature and Current Debates on Reproductive Technologies«, in: *Feminist Studies* 14 (1988), 3, pp. 545–561; for later debates see Dion Farquhar, *The Other Machine: Discourse and Reproductive Technologies* (New York: Routledge, 1996). For more recent feminist monographs on IVF, see Gay Becker, *The Elusive Embryo: How Women and Men Approach New Reproductive Technologies* (Berkeley: University of California, 2000); Sarah Franklin, *Embodied Progress: A Cultural Account of Assisted Conception* (London: Routledge, 1997); Debora Spar, *The Baby Business: How Money, Science, and Politics Drive the Commerce of Conception* (Cambridge, MA: Harvard Business School Press, 2006); Charis Thompson, *Making Parents: The Ontological Choreography of Reproductive Technologies* (Cambridge, MA: MIT Press, 2005); and Karen Throsby, *When IVF Fails: Feminism, Infertility and the Negotiation of Normality* (London: Palgrave, 2004).

- 22 Marilyn Strathern, *After Nature: English Kinship in the Late Twentieth Century* (Cambridge: Cambridge University Press, 1992); Marilyn Strathern, *Reproducing the Future: Anthropology, Kinship and the New Reproductive Technologies* (Manchester: Manchester University Press, 1992).
- 23 Sarah Franklin, Celia Lury & Jackie Stacey, *Global Nature, Global Culture* (London: Sage, 2000).

of Dolly the sheep (quickly followed by stem cell science, regenerative medicine, and synthetic biology). Five million miracle babies later, however, we might look back on Dolly mania and the stem cell wars as delayed reactions. Why else would the birth of a sheep or a few dishes of skin cells occasion such global diplomatic consternation if not that it confirmed exactly the same sequence inaugurated by IVF, which was developed in sheep as a model for humans? Is it perhaps that cloned sheep and cell lines did not presage a Brave New Biology so much as reveal the significance of *what had already happened in 1978*? Can we not see in the writings of Frances Fukuyama, Bill McKibben, or Jürgen Habermas examples of this oversight in their identification of PGD, the so-called designer-baby technique, developed 12 years after IVF and never practiced on anything like its scale, as the threshold technique auguring a loss of our humanity?²⁴ Doesn't IVF demonstrate that the most relevant question about technologically assisted futures is not if or when they will make us post- or trans-human, but whether those conditions have already been normalized by the reproductive model of ART, through which offspring are born whose »artificial conception« both embodies and confirms the benefits of scientific progress by incorporating technology into the human germline?²⁵

Of course when we speak of »IVF« we run into problems right away, since this term, as many feminists have pointed out, nominates the center of action as the fertilization of an egg in a Petri dish.²⁶ As the abbreviated name for a lengthy and complex procedure, »IVF« effects both a detachment and a substitution in the process of becoming symbolic shorthand for reproductive biomedicine as a whole. Controversially successful in hu-

24 Cf. Francis Fukuyama, *Our Posthuman Future* (New York: Farrar, Strauss & Giroux, 2002); Bill McKibben, *Enough: Staying Human in an Engineered Age* (London: Macmillan, 2003); or Jürgen Habermas, *The Future of Human Nature* (Cambridge: Polity, 2003).

25 The larger question about technology and human regeneration has been mentioned earlier, and could be seen through the emergence of agriculture to have already become part of the human condition, and thus human biology, much earlier. This is argued, for example, by both Marx and Engels, who describe both agriculture and industrialization as dialectical historical processes that have literally reshaped the human body. See Engels, »The Part Played by Labour«, op. cit. (note 6). In this sense we could argue technology is »already genetic.«

26 E.g. Deborah Steinberg, *Bodies in Glass: Genetics, Eugenics and Embryo Ethics* (Manchester: Manchester University Press, 1997).