

Eradicating Blindness

Logan D. A. Williams

Eradicating Blindness

Global Health Innovation
from South Asia

palgrave
macmillan

Logan D. A. Williams
Logan Williams Consultancy Services, LLC
Cumberland, MD, USA

ISBN 978-981-13-1624-1 ISBN 978-981-13-1625-8 (eBook)
<https://doi.org/10.1007/978-981-13-1625-8>

Library of Congress Control Number: 2018949316

© The Editor(s) (if applicable) and The Author(s), under exclusive licence to Springer Nature Singapore Pte Ltd. 2019

This work is subject to copyright. All rights are solely and exclusively licensed by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors, and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Cover design: Fatima Jamadar

This Palgrave Macmillan imprint is published by the registered company Springer Nature Singapore Pte Ltd. The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

Preface

In 2006, I discovered that my mother had early-stage cataracts in both eyes. At that time, we both lived in Boulder, Colorado, where I was a graduate research assistant in the Cardiovascular Dynamics and Ultrasound Laboratory. I decided that cataract disease (and the knowledges and technologies used to address it around the world) warranted closer scrutiny. In addition to my main research project on cardiovascular ultrasound, I completed a small secondary project at CU-Boulder on the bio-mechanics of porcine natural lenses. I also performed background research in February 2007 on the nature of cataract disease and was surprised by the great number of people it affects around the world. As part of this preliminary research, I checked out the World Health Organization's information about cataracts. On their website, they had a map that showed cataract surgical rates (or how many cataract surgeries per capita) for each country in the world in 2004. The fact that the USA, Western Europe, and Australia had high cataract surgical rates was not a surprise. What was confounding (to me) about this map was that it showed that India and Nepal also had high cataract surgical rates. *I had a puzzle: Why was it that India and Nepal had such high cataract surgery rates?* With my nascent interests in knowledge and technology

transfer for a social purpose, I began to determine just why these two countries, which are not as economically developed as the USA, had comparable rates of surgery. After I entered the Science and Technology Studies post-graduate program at Rensselaer Polytechnic Institute, I conducted initial doctoral dissertation fieldwork at Tilganga Institute of Ophthalmology in Nepal in 2009. Thus by starting “at home” with my mother’s cataract disease diagnosis, an interesting research project was born.

Cumberland, MD, USA

Logan D. A. Williams

Acknowledgements

I would like to thank God who answered my prayers with closed doors and open doors—guiding me all of this way on a path that I never could have imagined. I also very much appreciate the prayers and encouragement from my family and friends across the globe without which I would have been unable to finish this book!

Thanks are owed to all of the ophthalmologists, engineers, managers, and other individuals that I interviewed and observed in Kenya, Nepal, India, Mexico, and the USA. My fieldwork was facilitated by the introductions from various managers that I have been privileged to meet. For example, I am obliged to Thulasiraj Ravilla (India) for e-introducing me to Samson R. Ndegwa (Kenya); this introduction smoothed the way for my interviews at the Lions SightFirst Eye Hospital, Loresho (Kenya). Once I arrived at Loresho, Peter Ndigwa was kind enough to give me a tour of the campus, introduce me to potential interviewees, and organize my volunteer internship. I similarly appreciate Nabin K. Rai's coordination of my volunteer internships in the research department at Tilganga (Nepal) and Juan Carlos Rodriguez's work in arranging my interviews at Sala Uno (Mexico). My fieldwork in India would not have been possible without the invitation from Aurolab's P. Bala Krishnan to

visit the Aravind Eye Care System. Thanks also to Thulasiraj for hosting me at the Lions Aravind Institute of Community Ophthalmology (India).

My homestay family in Kathmandu (God Bless you J, D, S, R, M and N!) and my colleagues at LAICO were generous in their welcome, especially: my officemate Sanil Joseph, his wife Anuja Sanil, and their daughter Sarah Sanil; Thulsi's daughter Dhivya Ramasamy; and Dhivya's officemate Sashipriya Karumanchi Munirathnam. Thanks to Shrilakshmi Kannan and Dhivya for introducing me to potential interviewees at the Aravind Eye Hospital, Madurai (India). I continue to have fond memories of: "Melody Fridays" and teaching the Research Seminar at LAICO.

Some of my interviews in the USA would not have been possible without the e-introductions provided by John Ciccione at the American Society for Cataract and Refractive Surgery, and Jenny E. Benjamin, the director of the American Academy of Ophthalmology Museum of Vision in San Francisco, CA.

I appreciate the comments of my colleagues (specifically Thomas S. Woodson, Mark Waddell, Denver Tang, Amit Prasad, Toluwalogo B. Odumosu, Dean Nieusma, Sharlissa Moore, Daniel Menchik, Les Levidow, Anna Lamprou, Abby Kinchy, Christopher Henke, Steve J. Gold, Sara Fingal, Kevin Elliott, Jubin Cheruvelil, Cliff Broman, Kean Birch, James Bergman, Rich Bellon, Javiera Barandiaran, and Atsushi Akera) on chapters as I revised my dissertation into this book manuscript. Dissertation comments from my mentor, Ron B. Eglash, made me more sensitive to the economic and organizational practices of non-profits. The work of my mentor, David J. Hess, on industrial transition movements, provoked the insight of dual socio-technical regimes that I develop in this book. I especially want to thank Sean Valles for his chapter-by-chapter comments—I can only hope that I did a good job of coherently and selectively incorporating these suggestions into the manuscript. I was significantly encouraged by those conference participants who commented on an early draft of Chapter 6 at "Science and Technology Studies in South Asia" in May 2010, especially my discussant Deboleena Roy.

Audra Wolfe at The Outside Reader and my first two anonymous referees showed me the potential of transforming an early draft of this book into something more interesting. Finally, I appreciate Linda Nathan at LogosWord Designs, LLC, for copyediting an early draft of the manuscript.

Collecting empirical data for this book was directly supported by: a Short-Term Travel to Collections Award from the Lemelson Center at the National Museum of American History–Smithsonian Institute; a Council of American Overseas Research Centers Multi-Country Fellowship; a National Science Foundation DDIG (No. 1153308); and a Rensselaer Polytechnic Institute HASS Fellowship. The data collection was indirectly supported by the Council of Women World Leaders Environmental Policy Fellowship. Any opinions, findings, and conclusions or recommendations expressed in this material are mine and do not necessarily reflect the views of any of the financial supporters.

Parts of this book, especially Chapters 1 and 2, draw from the following journal articles:

- Williams, Logan D. A. 2013. “Three Models of Development: Community Ophthalmology NGOs and the Appropriate Technology Movement.” *Perspectives on Global Development and Technology* 12 (4): 449–75.
- Williams, Logan D. A. 2018. “The South Asian Origins of the Global Network to Eradicate Blindness: WHO, NGOs, and Decentralization.” *Endeavour* 42 (1): 27–41.

Contents

1	Introduction	1
2	Origins of an Autonomous Global Network to Eradicate Blindness	37
3	Balancing the Scales: Appropriate Technology and Social Entrepreneurship	77
4	Witnessing Rural Blindness: Standardizing Benchmarks from Eye Camps	111
5	A Laboratory of Our Own: Technology Diffusion from the Incumbent Regime	145
6	The Hard Case of White Cataracts: Appropriation of Surgical Science	181
7	Training the New Cadre: Translation of Interlocking Innovations	217

8	Evidence-Based Medicine: Contesting the Phaco-Regime	253
9	Conclusion: Innovation from Below	289
10	Appendix A: The Extended Case Method and Global Ethnography	315
11	Appendix B: The Robin Hood Model	333
	Organizational Charts for Four Community Ophthalmology Units	353
	Glossary of Common Ophthalmology Surgical Terms	359
	Index	363

List of Figures

- Fig. 1.1 An emergent radical rule-set, multiple niches supporting interlocking innovations in finance, science and technology, and coexistence of dual regimes in the landscape 23
- Fig. 3.1 Aravind Eye Hospital Outpatient Building (the first building on the central campus of Aravind Eye Care System in Madurai) which G. Srinivasan built floor-by-floor over five years as funds allowed (Photo by Logan D. A. Williams) 91
- Fig. 5.1 Checking IOL surface quality under a microscope at Tilganga-FHIOL in Kathmandu, Nepal (Photo by Logan D. A. Williams) 171
- Fig. 7.1 Entrance to the Lions Aravind Institute for Community Ophthalmology which shows a drawing of Gandhi to the right of the doorway and a bust of Sri Aurobindo centered between the open doors (Photo by Logan D. A. Williams) 226
- Fig. 8.1 Drawing of my observation in the Aravind “Free Hospital” (Walk-in Hospital) Operating Theater. I stood by the instruments window and ophthalmic assistants came past me every few minutes to the window near my left shoulder to drop off a tray, with its set of used instruments, so they

	could be quickly sterilized and used again (Williams 2012, July 16)	268
Fig. 9.1	Coexistence of dual regimes, SICS v. Phaco, in the differentiated landscape. Each of the two regimes has the typical dimensions: Dimension 1 Technology; Dimension 2 Markets, user practices; Dimension 3 Culture, symbolic meaning; Dimension 4 Infrastructure; Dimension 5 Industry; Dimension 6 Policy; and Dimension 7 Scientific knowledge	297
Fig. 11.1	New building on campus of Tilganga Institute of Ophthalmology (Photo by Logan D. A. Williams)	334
Fig. 11.2	Bright windows shine light onto the patient walking ramp between ground floor and first floor in the Lions SightFirst Eye Hospital, Loresho, Premchandbhai foundation wing (Photo by Logan D. A. Williams)	341
Fig. 11.3	Reception desk at Sala Uno (Photo by Logan D. A. Williams)	346

List of Tables

Table 3.1	Two main types of social enterprise organizations (partially adapted from Alter [2003], Jalali [2008], Monroe-White [2014])	80
Table 3.2	Diverse revenue sources pay for expenses at the Aravind Eye Care System (India)	93
Table 3.3	Comparing percentages of paying versus subsidized (or non-paying) patients in the cost recovery models across four community ophthalmology units in 2012	101
Table 7.1	Ranking countries using GDP (PPP) per capita; in the world system, core countries have low number ranks while peripheral countries have high number ranks (Central Intelligence Agency 2012; United Nations Development Programme 2017)	230
Table 11.1	Diverse revenue sources pay for expenses at Tilganga Institute of Ophthalmology (Nepal)	336
Table 11.2	Diverse revenue sources pay for expenses at the Lions SightFirst Eye Hospital, Loresho (Kenya)	340
Table 11.3	Diverse revenue sources pay for expenses at Sala Uno (Mexico)	345