

Kuo-Hui Chang · Gary Lee Downey ·  
Bono Po-Jen Shih

# Engineers and the Two Taiwans

The Abnormal Club

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The Abnormal Club

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## Engineers and the Two Taiwans:

### The Abnormal Club



Departing from Taiwan (要離開台灣)

Artist: 陳秀芳 Susan Hsiu-Fang Liu, January 2013

Courtesy of Susan Hsiu-Fang Liu and Taiwanese American Archives

*To the engineers and technicians who contribute  
themselves and their knowledge to make and  
re-make Taiwan*

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We have benefitted greatly from the comments and suggestions of many colleagues as we presented portions of this manuscript at the Society for Social Studies of Science, Society for History of Technology, International Society for the History of East Asian Science Technology and Medicine, and Taiwan STS Association, as well as the University of Science and Technology and Jeonbuk National University in South Korea and National Yang Ming Chiao Tung University in Taiwan.

Kuo-Hui: My department, the Graduate Institute of National Development at National Taiwan University, generously provided me with resources and space to enable me to research and write this book. I greatly appreciate my many fruitful conversations about it with faculty and student colleagues. My co-authors were my fundamental base to keep me determined and help me get through the relentless challenges we faced. They inspired me with their impressive perspectives and insights. I owe a huge debt to them, especially Gary Downey. I deeply realize my academic career would have suffered to a degree I could not imagine if I had not worked with him. He is also a precious friend from whom you can learn and benefit from his wisdom. In addition, I would like to thank Kuo Wen-Hua, Jongmin Lee, and Manyong Moon for their encouragement and advice regarding this book project.

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Gary: I am grateful for having had the opportunity to collaborate with two fine scholars and close friends, both of whom and whose families became my teachers. I have long been amazed by Kuo-Hui's vast knowledge of the technical and policy landscapes of Taiwan, his remarkable ability to embody different perspectives and sensitivity to the nuances of alternative interpretations, and his great generosity in helping others learn, including me. And I have benefitted greatly from Bono's analytical acumen, ability to articulate and (re)frame finding and argument, and insightful commitment to locating and integrating the detailed point that proves to be so much more, all owing to his remarkable trajectory through engineering to STS and back. Both of them have lasting attachments to National Taiwan University. That I was also able to gain a Taida attachment when I served as visiting Chair Professor in the Graduate Institute of National Development with the support of the National Science and Technology Council has delighted me, both enacting the material connection that lives in this collaboration and helping me personally to fulfill dreams of learning from others that I have carried throughout my career. I am grateful for the opportunity and thank Kuo-Hui in particular for making it happen.

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I dedicate my contribution to this book to my late father, Shih Chun-Hsien, who was a chemical engineer working diligently at Hitachi Chemical of Kaohsiung to raise

his beloved small family. Remembering his decision (around the year 1967) to study chemical engineering in Kaohsiung Junior College of Technology's (高雄工專) five-year programs (which admitted junior high school graduates) instead of going to Kaohsiung High School (高雄中學) inspires me to appreciate how the evolution of engineering education and practices in Taiwan intersected with the economic development that he once went through and contributed to along with my mom and many participants of their generation.

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## About the Book

The identity of Taiwan is a matter of intense local and international debate. This book shows how engineers helped produce two distinct visions of the land of Taiwan and its people, elevating the value of engineering as a career path in the process.

The technical work of engineers that typically avoids partisan politics can actually contribute to partisan differences and conflict because engineers have different identities, commitments, and forms of knowledge. In most countries, the rise of engineering is about the emergence of a single dominant vision of the country. In Taiwan, two distinct visions of the land and its people emerged, owing to the presence of two distinct geographical identities—*islander* and *mainlander*.

The unique collaboration among small and large companies in the electronics industry proved to be transformative, producing an “abnormal club” of *mainlander* and *islander* engineers, as one mixed group had earlier called itself. However, because the two collections of engineers had contrasting geographical identities, their work in electronics actually aimed to produce different Taiwans.

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## About the Authors

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**Gary Lee Downey** is an ethnographic listener committed to engineering studies, STS making & doing, and exploring/inflecting connections between knowledge and personhood. Trained as a mechanical engineer (B.S. Lehigh) and cultural anthropologist (Ph.D. Chicago), he is Alumni Distinguished Professor Emeritus of Science, Technology, and Society and affiliated faculty member emeritus in Women's and Gender Studies and Engineering Education. His books include *Making & Doing: Activating STS through Knowledge Expression and Travel* (MIT Press, 2021, co-edited with Teun Zuiderent-Jerak); *Engineers for Korea* (Morgan & Claypool, 2014, with Kyonghee Han); *What is Global Engineering Education For?* (Morgan & Claypool, 2011, co-edited with Kacey Beddoes); *The Machine in Me: An Anthropologist Sits Among Computer Engineers* (Routledge, 1998); and *Cyborgs and Citadels: Anthropological Interventions in Emerging Sciences and Technologies* (SAR Press, 1998; co-edited with Joseph Dumit). Co-founder of the International Network for Engineering Studies, he edits the Engineering Studies series at MIT Press (with Matthew Wisnioski) and the Global Engineering Series at Springer Nature. As president of the Society for Social Studies of Science (2013–2015), he co-led the creation of its initiative in STS making & doing, inflecting STS knowledge production through the scholarship of knowledge expression and knowledge travel.

**Bono Po-jen Shih** is an interdisciplinary scholar working in the intersection of philosophy, history, and sociology of engineering with an eye on contemporary engagement with engineering education and practice. His publications appear in Springer's *Philosophy of Engineering and Technology* (PET) book series, the journal *Techné: Research in Philosophy and Technology*, and the *Taiwanese Journal for Studies of Science, Technology and Medicine*. He currently holds a postdoc appointment with two institutions at Penn State University—the Rock Ethics Institute and the Leonhard Center for Enhancement of Engineering Education—to facilitate exchange and collaboration between philosophers and engineers. Prior to joining Penn State, he was a Postdoctoral Research Fellow at the Science History Institute working on the history of engineering ethics education. He earned his PhD and MS in science and technology studies (STS) from Virginia Tech. He also has a graduate certificate in engineering education (ENGE) from Virginia Tech and a Bachelor of Science in electrical engineering from National Taiwan University.

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# Abbreviations

|                                   |                                                                                                                                                                                    |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 228                               | Incident on February 28, 1947                                                                                                                                                      |
| 31 Society                        | 31 engineers sent by Republic of China’s Resource Committee to the United States to study industrial and infrastructural engineering in 1942 (Also 31st year of Republic of China) |
| Academic Society                  | Chinese-American Academic and Professional Society                                                                                                                                 |
| AMI                               | American Microsystems, Inc.                                                                                                                                                        |
| AT&T                              | American Telephone and Telegraph Company                                                                                                                                           |
| CCP                               | Chinese Communist Party                                                                                                                                                            |
| CECI                              | Chinese Engineering Consultants, Inc.                                                                                                                                              |
| Chiao Tung University             | National Chiao Tung University                                                                                                                                                     |
| Chinese Institute                 | Chinese Institute of Engineers                                                                                                                                                     |
| Classical learning                | Classical Chinese learning                                                                                                                                                         |
| CPC                               | Chinese Petroleum Corporation                                                                                                                                                      |
| CTCI                              | China Technical Consultants, Inc.                                                                                                                                                  |
| CUSA                              | Council for United States Aid                                                                                                                                                      |
| DPP                               | Democratic Progressive Party                                                                                                                                                       |
| EIRC                              | Electronics Industry Research Center                                                                                                                                               |
| Fairchild                         | Fairchild Semiconductor International Inc.                                                                                                                                         |
| Formosan Association              | Formosan (Taiwan Provincial) Association for the Advancement of Science                                                                                                            |
| High-tech Forum                   | U.S. Taiwan High-tech Forum                                                                                                                                                        |
| IBM                               | International Business Machine                                                                                                                                                     |
| IC                                | Integrated circuits                                                                                                                                                                |
| ICT                               | Information and computer technologies                                                                                                                                              |
| Industrial Technology Association | Taiwanese-American Industrial Technology Association—Silicon Valley                                                                                                                |

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|                                          |                                                               |
|------------------------------------------|---------------------------------------------------------------|
| ITRI                                     | Industrial Technology Research Institute                      |
| KMT                                      | Kuomintang (Nationalist Party)                                |
| METS                                     | Modern Engineering and Technology Seminar                     |
| MIT                                      | Massachusetts Institute of Technology                         |
| MOEA                                     | Ministry of Economic Affairs                                  |
| Monte Jade                               | Monte Jade Science and Technology Association                 |
| NATEA                                    | North America Taiwanese Engineering & Science Association     |
| National Council                         | National Science and Technology Council                       |
| National Labs                            | National Applied Research Laboratories                        |
| OEM                                      | Original equipment manufacturing                              |
| PRC (People's Republic)                  | People's Republic of China                                    |
| Professionals Association                | Chinese-American Professionals Association                    |
| Professors Association                   | North American Taiwanese Professors Association               |
| RCA                                      | Radio Company of America                                      |
| ROC                                      | Republic of China                                             |
| RSEA                                     | Ret-Ser Engineering Agency                                    |
| Science park                             | Science-based industrial parks                                |
| SMIC                                     | Semiconductor Manufacturing International Company             |
| SMEs                                     | Small- and medium-sized companies/enterprises                 |
| STPI                                     | Science and Technology Policy Research and Information Centre |
| STS                                      | Science and Technology Studies                                |
| Taida                                    | National Taiwan University                                    |
| Taipei Institute                         | Provincial Taipei Institute of Technology                     |
| Taipei School                            | Industrial schools—Taipei Industrial School (Institute)       |
| Taiwan Electric (Taiwan Power; Taipower) | Taiwan Electric Company                                       |
| TSMC                                     | Taiwan Semiconductor Manufacturing Company                    |
| TI                                       | Texas Instruments                                             |
| Tsing Hua University                     | National Tsing Hua University                                 |
| UMC (United Microelectronics)            | United Microelectronics Corporation                           |
| United Formosans                         | United Formosans in America for Independence                  |