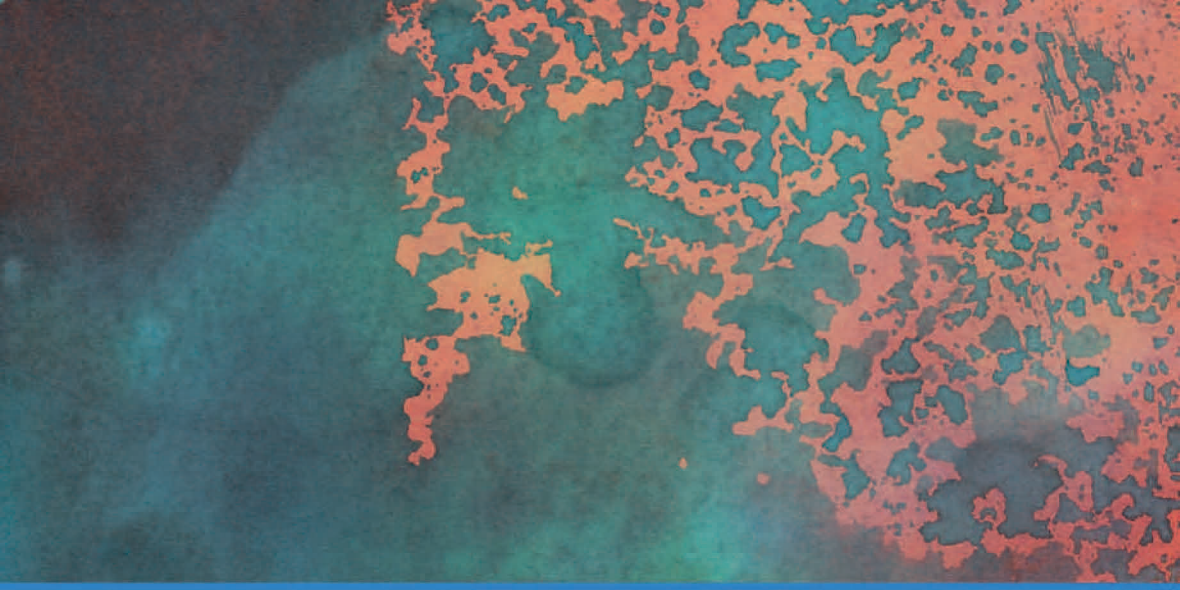
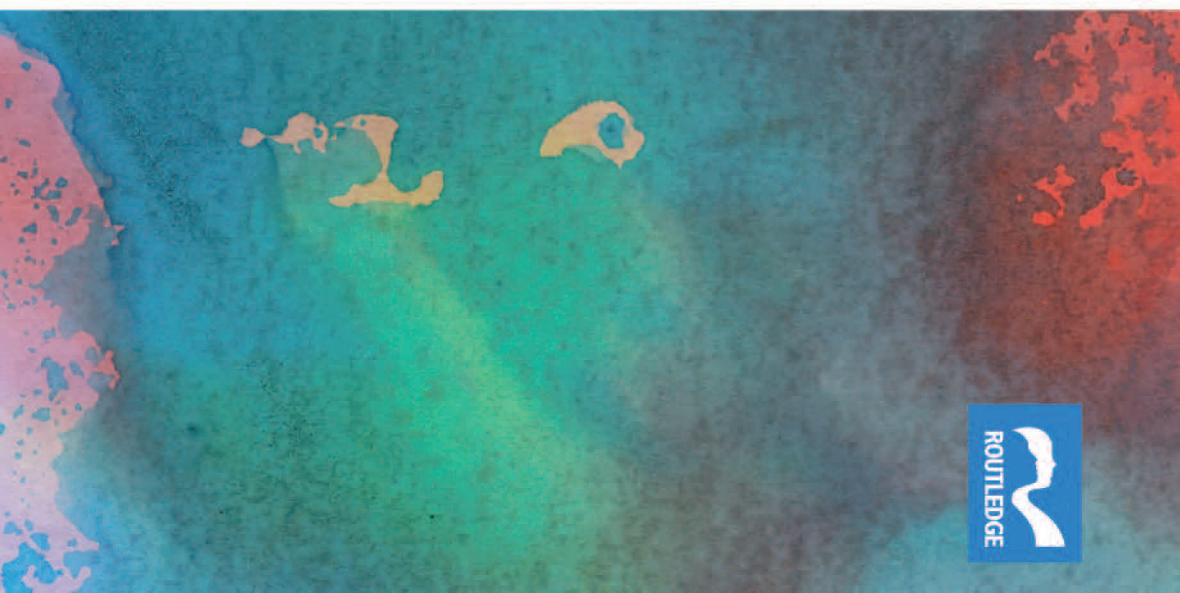


CHROMOSOME WOMAN, NOMAD SCIENTIST

E. K. JANAKI AMMAL, A LIFE 1897–1984

Savithri Preetha Nair



ROUTLEDGE

"Janaki Ammal's was an exemplary life, and she has been lucky in her biographer. Historian of science, Savithri Preetha Nair, matches her subject's zest and energy, following her traces in far-flung archives in the United States, the United Kingdom and India. She closely tracks Janaki Ammal's relations with her scientific peers, and with her extended family (to whom she was very close). Her scientific research and achievements are narrated expertly, in language accessible to a lay audience but with no sacrifice as regards complexity and nuance. When published, this will be the best biography of an Indian scientist written thus far. In the authoritativeness of its research, and the sensitivity of its treatment, it far outdoes the existing biographies of male scientific icons such as C. V. Raman, Homi Bhabha, and Meghnad Saha."

—Ramachandra Guha in *The Telegraph*

"Savithri Preetha Nair's labour of love is truly inspiring, from the perspective of both biography-writing and writing history of science."

—Deepak Kumar, Historian of Science

"It is the definitive biography of an Indian woman botanist who made many notable contributions but who never received her due in her long career. With extensive archival and other research, Savithri Preetha Nair recreates, for the first time, the life and times of the pioneering E. K. Janaki Ammal and of her contemporaries. This is also a very fine contribution to the history of science in India in the twentieth century."

—Jairam Ramesh, MP, former Union Minister, and author

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CHROMOSOME WOMAN, NOMAD SCIENTIST

This is the first in-depth and analytical biography of an Asian woman scientist—Edavaleth Kakkat Janaki Ammal (1897–1984). Using a wide range of archival sources, it presents a dazzling portrait of the twentieth century through the eyes of a pioneering Indian woman scientist, who was highly mobile, and a life that intersected with several significant historical events—the rise of Nazi Germany and World War II, the struggle for Indian Independence, the social relations of science movement, the Lysenko affair, the green revolution, the dawn of environmentalism and the protest movement against a proposed hydro-electric project in the Silent Valley in the 1970s and 1980s.

The volume brings into focus her work on mapping the origin and evolution of cultivated plants across space and time, to contribute to a grand history of human evolution, her works published in peer-reviewed Indian and international journals of science, as well as her co-authored work, *Chromosome Atlas of Cultivated Plants* (1945), considered a bible by practitioners of the discipline. It also looks at her correspondence with major personalities of the time, including political leaders like Jawaharlal Nehru, biologists like Cyril D. Darlington, J. B. S. Haldane and H. H. Bartlett, geographers like Carl Sauer and social activists like Hilda Seligman, who all played significant roles in shaping her world view and her science.

A story spanning over North America, Europe and Asia, this biography is a must-have for scholars and researchers of science and technology studies, gender studies, especially those studying women in the sciences, history and South Asian studies. It will also be a delight for the general reader.

Savithri Preetha Nair received her doctorate in 2003, from the School of Oriental and African Studies (SOAS), University of London, for her dissertation on the museum and the shaping of the sciences in colonial India. Nair's research interests include history of science, modernity and enlightenment at the turn of the nineteenth century, history and politics of collecting for science, sociology of knowledge, the public museum and women in science in colonial and post-colonial India. Among her

publications is the co-authored (with Richard Axelby) *Science and the Changing Environment in India: A Guide to Sources in the India Office Records 1780–1920* (British Library, London, 2010), and the monograph, *Raja Serfoji II: Science, Medicine and Enlightenment in Tanjore, 1786–1832* (Routledge, 2012), besides several papers in peer-reviewed international journals and edited volumes. Nair is an independent scholar and divides her time between London and Kerala.

CHROMOSOME WOMAN, NOMAD SCIENTIST

E. K. Janaki Ammal, A Life 1897–1984

Savithri Preetha Nair

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TO MY FATHER

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FOREWORD

Pnina Geraldine Abir-Am

This new, book-length, biography of South Asian cytogeneticist and scholar of the global origins and evolution of cultivated plants (including several pertinent disciplines, such as plant geography and ethnobotany) E.K. Janaki Ammal is a landmark contribution to the history of women in science, as well as to the history of biology. Several reasons justify this evaluation:

Though the history of women in science has been a most active and dynamic field for over four decades (the History of Science Society has been awarding prizes for 'outstanding research' on women in science, in book and article alternating formats, since 1987),[1] there are still relatively few book-length biographies of women scientists, especially biologists. Among the most remarkable such biographies to which this book can be compared, one finds Joy Harvey's on French evolutionary theorist Clemence Royer, 1830–1902[2]; Marilyn Bailey Ogilvie's on American ornithologist Margaret Morse Nice[3]; Sona Strabanova's on British bacteriologist Marjory Stephenson,[4] one of the first two women elected to the Royal Society in 1945; and of course several works on American cytogeneticist and sole 1983 Nobel laureate Barbara McClintock[5] (1900–1990). However, all these works are about women biologists from Europe and North America. By contrast, Savithri Preetha Nair's biography of E. K. Janaki Ammal (hereafter Janaki) introduces us to the largely unknown but most fascinating character of a woman cytogeneticist from South Asia. Born on the Southwestern coast of India, Janaki was a close contemporary of Barbara McClintock, as well as a citizen of the world. Indeed, Janaki took her doctorate in botany from the University of Michigan in 1931, just at the time McClintock published her early seminal papers. Janaki dreamt all her life to do her research at her alma mater and maintained life-long correspondence with the Chairman of her Department, H.H. Bartlett, and friend women geneticists Frieda Cobb Blanchard (known to us from the late Sylvia McGrath's essay on Blanchard's collaboration with her husband there)[6] besides the almost unknown Eileen Erlanson Macfarlane; Janaki's dream and desire to return to America did not materialise.

She revisited America once in the 1950s, as the only woman speaker at a landmark ecological conference at Princeton, and was given an honorary doctorate from her alma mater. However, race ('we Asians are not allowed to work in America; I only want to do research!') and gender, as well as the repressive spirit of the 1950s, prevented her from translating her feeling 'more American than British' into a permanent reality. Given what we know from the predicament of women scientists in America prior to the 1970s, McClintock included, it was probably better for Janaki to spend her life in India, except for the 1940s which she spent in the United Kingdom.

The importance of this biography to the history of women in science is not limited to its subject's unconsummated desire to conduct her research in America, but rather extends to Janaki's unusually resourceful and peripatetic life in science, moving between three continents and a considerable number of scientific institutions. All along, she managed to pursue her main interest in the origins and geography of cultivated plants by cytogenetic means, while retaining relative freedom from hierarchical and patriarchal institutions such as the government sponsored agricultural breeding stations.

From the viewpoint of a contribution to the history and philosophy of biology, this biography captures both the transdisciplinary nature of Janaki's practice, which thrived at the border zones between a wide range of fields and sub-fields, including cytogenetics, plant breeding, cytosystematics and ethnobotany; and her pursuit of a new mode of thinking that best suited her unstable, precarious research objects. The biography suggests that Janaki's efforts to distance herself from state science (practiced in the service of crop improvement and run by tyrannical directors who did not understand the importance of basic research) led her to develop her own practice of 'nomadic science,' a less stable and more precarious mode of knowing yet one that is more open to innovation and change than state science, which seeks to maintain the status quo. Ironically, post-colonial science which was supposed to be liberatory ended up adopting dominant models which discouraged change and innovation.

This is a very interesting argument which the biography grounds in the recent trend in science studies to focus on alternative modes of both being and thinking, modes that enable historical actors to have multiplicity of lives while privileging transitional objects of research such as polyploidy. Janaki is thus shown to have been first and foremost a cytogeneticist, master of fixating chromosomes, inducing chemically the formation of polyploidy, counting and systematising on the basis of new combinations of chromosomal sets, but also a 'field biologist, a plant geographer, a paleobotanist, an evolutionary systematist, and experimental breeder, an ethnobotanist, and not least a naturalist and a traveler-explorer' (Epilogue, p. 7).

This was a most remarkable achievement for a woman whose life in science spanned over half a century, from the late 1920s to the early 1980s, who published prolifically throughout that time, and who managed to acquire a

measure of national and international recognition, such as membership in leading scientific societies (the Linnean Society, the Genetics Society and the Indian Academy of Sciences of which she was among its founders) even though the highest honours such as FRS or Padma Bhushan were reserved for those who laboured to maintain the status quo.

It is a great achievement of this biography to document in meticulous and extensive archival detail, having consulted circa 30 archives, roughly a third in each country of India, the United Kingdom and the United States, and complemented them by oral history. These archives were widely dispersed in each country, as a result of Janaki's intense peripatetic existence, which required that the historian too become the practitioner of 'nomadic' scholarship.

Janaki's various moves in space and time, while unpacking her immense range of research objects, tropical as well as temperate plants, plants of economic importance, most notably the sugar cane, ornamental plants, and plants used for subsistence by forest dwellers, the latter being part of a late-in-life interest in ethnobotany which coincided with the rise of environmentalist and conservation movements in the 1970s.

This biography inadvertently sheds new light on Barbara McClintock, the best known American woman cytogeneticist, sole Nobel Laureate (1983), contemporary of Janaki, and subject of several biographical works, by highlighting the key role of gender in trumping race and class, in the process of marginalising women scientists and depriving them of timely credit.

Much as with women scientists from Europe and America, this biography draws attention to progressive men scientists who helped Janaki prevail in her adamant quest for a life of research. It also raises the question as to whether such men may have been influenced by a few enlightened British scientists who opened their labs to women in the inter-war era, such as the biochemist F. G. Hopkins at Cambridge and the X-ray crystallographers W. H. Bragg and J. D. Bernal, in London. In India, as elsewhere, men of science largely favoured male students, which is why Janaki's trajectory can be safely described as an ingenious strategy to escape patriarchy in both science and society, during both colonial and post-colonial times.

The book is very enlightening on the intersection of Janaki's life with world history, whether during the blitz on London in World War II which made her feel as a 'world citizen,' but especially on the role of science in nation building in India, where she occupied a few key positions in science policy, such as director of the Botanical Survey of India, founding director of the Central Botanical Laboratory and member of advisory committees, in the decade after Independence. Her participation in the protests to stop a hydroelectric project in the Silent Valley in the 1970s illustrates how she managed to combine her roles as scientist seeking to map cytogenetically the deep forests, as an activist supporting the environmentalist movement and as a science policy figure serving on committees in search of solution for

alternative sources of power. This part on whether the ancient forest will be saved, towards the end of the book, reads as a detective story, and serves as a superb end to a most remarkable life in science.

Another major contribution of the book pertains to using the biographee's life as a context for how science is created. On the one hand, it aims to show the pluralistic practice of modern genetics, as revolving not only around genes and model organisms but also around many ways of constructing knowledge and many networked actors. This is a story of science in the making, rather than the story of a seminal discover (as was the case, for example, with Barbara McClintock's discovery of 'jumping genes'). Though Janaki spent some of her time as an employee of state institutions such as agricultural experimental stations, doing plant hybridisation (mainly sugar cane) with an eye for improving crops, most of her time was spent on the move, either on solitary travels of exploration (all over India, from the Himalaya and Kashmir to Madras and Malabar) or in research on chromosomes, polyploidy and, especially their role in creating new, reproducible hybrids.

Along these lines, this biography combines the micro level of Janaki's intense interaction with her enormously diverse cytogenetical preparations, encompassing both tropical and temperate plants, and the special technical skills she developed in fixating them, with the macro level of interaction with institutions and individuals inhabiting the stable existence of state science.

The biography's argument that Janaki's ongoing mobility across interstices, borders and bylanes of science signified not only her ontology but also her epistemology, namely that she chose to become a peripatetic figure (the author uses the metaphor of 'nomad') which is embedded in literary and anthropological studies as a signifier of lacking the stability of a permanent abode, being on the move, to 'break free from the tyranny of hierarchy, patriarchy, and pseudo-science she encountered in the male bastions of state science such as crop breeding stations' (p. 10) but also to be able to contemplate the world via an archipelagic thinking, as a collection of interconnected islands rather than as closed continental forms.

The biography also has an important lesson for historians and others who seek to reconstruct the lives and unorthodox science of women scientists such as Janaki, namely to lobby for the collection and cataloguing of the Personal Papers of women scientists, so that future biographers be able to produce well-documented biographies. This work is a labour of love, and hence, it is disconcerting to learn that Janaki's incoming letters were not preserved; nor were her remarkable slides. Since the biography was pieced from letters and documents of hers found in the archives of her interlocutors, most notably her sponsors, colleagues, and friends and family in India, the United Kingdom and the United States, whose Papers did make it to institutional archives, especially if they were department chairmen, we may

not find out how the intersectionality of gender, race, caste and age played out in her life-long meaningful relationships.

This biography should serve as an exemplar of the doability of recovering the lives and historical agencies of other women scientists from Asia and other regions which harbour such exciting biographees. Janaki's life, challenged by the intersecting constrains of gender and race in three continents, is inspirational for girls and women not only in South Asia but everywhere. As opportunities for practicing science become increasingly available to women, so we need dedicated historians, such as Savithri Preetha Nair, to make sense of the complex traces left by peripatetic women scientists in their countries of origins, as well as all over the entire world.

3–15–2022

Notes

1 hssonline.org/prizes/Rossiter prize
2 Harvey, Joy D. '*Almost a Man of Genius', Clemence Royer, Feminism, and 19th Century Science* (New Brunswick, NJ: Rutgers University Press, 1997).
3 Bailey Ogilvie, Marilyn. *For the Birds, American Ornithologist Margaret Morse Nice* (Norman, OK: University of Oklahoma Press, 2019).
4 Soňa Štrbáňová. *Holding Hands with Bacteria: The Life and Work of Marjory Stephenson* (Berlin and Heidelberg: Springer Verlag, 2016).
5 Keller, Evelyn Fox. *A Feeling for the Organism: The Life and Work of Barbara McClintock* (New York: Henry Holt, 1983); Kass, Lee B. Records and recollections: A new look at Barbara McClintock, Nobel Prize-Winning geneticist. *Genetics* 164 (2003): 1251–1260. www.ncbi.nlm.nih.gov/pmc/articles/PMC1462672/; or www.genetics.org/content/164/4/1251; Comfort, Nathaniel C. *The Tangled Field: Barbara McClintock's Search for the Patterns of Genetic Control* (Cambridge, MA: Harvard University Press, 2001).
6 See chapter 9 in Pycior, Helena M., Nancy G. Slack, and Pnina G. Abir-Am (eds.). *Creative Couples in the Sciences* (New Brunswick, NJ: Rutgers University Press, 1996).

ACKNOWLEDGEMENTS

One afternoon, in 2002, at the General Library of the Natural History Museum, London, which I had been visiting to consult materials for my doctoral dissertation, I was distracted by an old volume lying casually on the table that I was working on. Piqued by curiosity, I picked it up to discover that it was a list of members of the Eugenics Society (the Galton Institute) from its early years. Flipping through its pages, I came upon several familiar names: H. G. Wells, Havelock Ellis, J. M. Keynes, Julian Huxley, R. A. Fisher, Marie Stopes . . . and then in the most unanticipated of places, an Indian one, the only name I had spotted until that point. The year was 1932 but what baffled me most was that it was a woman, from South India evidently, but a name I had never heard before: 'E. K. Janaki Ammal, Lawley Road, Coimbatore.' Little did I know that this chance encounter would set me off on a humbling even if exhilarating journey, and one that would last so long, that it would end up consuming one-third of my lifetime, and by which time I had metamorphosed into a grandparent! I walked, scrambled and wandered in her trail, and for great stretches of time it was in darkness and isolation, until a tiny speck of light appeared at the end of the tunnel. I ambled towards it, and it grew bigger, but it was painfully slow striving, which I can only compare to trekking precariously up a steep mountain in a dreadful storm carrying an unwieldy load on one's back. It is that orb, a mere glimpse of which I had caught sight of, that I now offer to the readers in the form of this book. Nothing more. Nothing less.

I would like to see this biography as a triumph of independent scholarship against all odds. I could not have accomplished this alone however. The debt I owe—to people, plants and books—has grown into a great heap but I must first invoke those kindred spirits that pervade this volume, people who, when I began my journey, were with me, sharing their memories and whatever else they could, but are sadly no more: Janaki's nieces, Padma Padmanabhan and Shashi (a.k.a. Saraswathi, who sang the 'Koduvalli Blues,' so beautifully for me and my companion) and her nephews, E. K. Hari Krishnan, Ram Damodar, Muthukrishnan and more recently, Shyam Damodar. I also remember with gratitude, the late Oliyath Sayeed,

who tirelessly showed me around his home town of Tellicherry, Malabar, Premnath Moorkoth who corresponded with me on 'Thiyas,' and Murkoth Ramunni, who spoke to me at length about Tellicherry, Laccadives and his close relationship with Janaki's adventurer brother, E. K. Madhavan. I am grateful to the late mycologist C. V. Subramanian, who readily met with me and presented me with a booklet on the University Botanical Laboratory. Justice Krishna Iyer, despite his advancing years, readily shared with me his memories as a tenant of the Edathil family, in Tellicherry; he recalled seeing Janaki Ammal, during the long vacations, out and about carrying baskets of plants collected from the neighbouring fields. I was utterly shocked to hear of the sudden demise of P. Lakshminarasimhan of the BSI, who I had been in regular correspondence with; his generosity and kindness will live with me. Another big loss has been that of Prof. M. K. Prasad. It was thanks to him, that I spoke on Janaki in Kerala (in June 2010) for the first ever time (for which thanks also to K. R. Lekha of the Kerala State Council for Science Technology and Environment, Government of Kerala), at the Shastra Bhavan, Trivandrum. Shortly after, thanks again to Prof. Prasad, I was invited to talk on Janaki at the School of Environmental Sciences, MG University, Kottayam. I pay homage also to the succulent specialist Gordon Rowley, who once trained under Janaki at Wisley, and Dorothy Blanchard, who as a young girl in Ann Arbor, interacted with her; both were generous in sharing with me their memories of her. It was very late that I learnt of the passing of Usha Zutshi, who so warmly received me in Jammu and took me to all of Janaki's favourite haunts; she introduced me to her fellow doctoral students (one of them B. L. Bradu, I regret is also no more), and sharing fond memories of her esteemed doctoral supervisor.

I can't thank Janaki's siblings and their children enough, some in particular, for preserving precious material—private correspondence and diaries—and hail their sense of history: Aarthi Ajit (and her loving family): how can anyone so young be so willing to share for knowledge-sake! Uma Ramachandran, the most senior among them, who has not only done more for this book than anyone else but also treated me as her own. Shamini Ramesh for her generosity. Geeta Doctor, for her words of encouragement and some Janaki-anecdotes. The late Shyam Damodar and Hyma for their candour and kindness. And Chithra, and her sister Lalitha, for sharing memories and rare photographs of their eminent aunt.

Janaki was a tireless traveller, and I had to match this at least to a modest extent, if I were to write her biography, and this required funds. I was fortunate to receive a small grant from the British Academy, in 2008, which enabled me to travel to the University of Michigan, to conduct research; I was at this time a postdoctoral scholar based at the School of Oriental and African Studies, University of London and the British Library, working on a completely different project. I am grateful to the British Academy, to Prof. David Arnold for recommending me to it and to the extremely helpful staff

at the Bentley Historical Library at Ann Arbor, and my late cousin, Vinod and wife Asha, for hosting me during my stay in Michigan. Besides Dorothy Blanchard, I am grateful to Dorothea Colman of the Matthaei Botanic Gardens, Michigan, for the immense warmth with which she welcomed me at the Gardens and in tracing relevant material from the Garden-archives and *The Michiganensian*. It was also about this time that I would consult the substantial Darlington Papers at the Bodleian Library, Oxford. The five-decade long correspondence between Janaki and Darlington provided the chief leads and would serve as one of my chief founts of information.

For a great many years, work on the biography was carried out alongside my other researches, and without financial support; the result was that it was mostly put on the backburner, research being limited to focused reading, teaching myself basic genetics, hunting down sources (surprising myself at times) and nursing the ailing sapling of the *Magnolia kobus* 'Janaki Ammal' in my back garden in London. From 2007, I had also turned nomadic, taking my work (in progress) to various platforms, in the United Kingdom, United States and India. As part of a panel on twentieth-century science in India at the Annual Meeting of the British Society for the History of Science (BSHS), Manchester (28 June–1 July 2007), I gave a paper on 'The Impact of Soviet Biology on Indian Plant Genetics: E K Janaki Ammal and Her Contemporaries, 1930s–40s'; I thank my co-panelists Pratik Chakrabarti and Jahnavi Phalkey for this opportunity. This was followed by a presentation at the Annual Conference of the British Association of South Asian Scholars (BASAS), Leicester (26–28, March 2008).

A few sunny spots appeared in the firmament at about this time. I was awarded a New India Foundation Fellowship (2008–09), which was a great blessing. The Fellowship not only took care of my maintenance for a year but also funded my research travels in India (to Madras, Delhi, Calcutta, Lucknow and Jammu). I am most grateful to all those on the Board of the NIF, and to Ramachandra Guha in particular for this. Work on the biography received a great fillip with this grant, and I was able, in April 2010, to present something of the work in progress at the Indian Institute of Science, Bangalore, under the aegis of the Centre of Contemporary Studies (CCS), thanks to Prof. P. Balaram, then Director and Prof. Raghavendra Gadagkar, of the Centre for Ecological Studies and the CCS. Following this presentation, I was offered a year-long Visiting Fellowship at the CCS (which was mostly devoted to writing up my book on Tanjore however). It not only gave me the opportunity to reunite with a city I had grown up in, but living on campus, amidst its abundant nature—the Slender Lorises (making nights so live with their hoots), great trees and shrubs (including a beautiful *Magnolia grandiflora*), giant honeycombs and monstrous lianas—prepared me for Janaki, besides giving me limitless joy. I am ever thankful to Prof. Gadagkar for this. It was also here that I had the occasion to browse through the entire series of back volumes of the *Current Science* and the *Proceedings*

of the Indian Academy of Sciences, groundwork so essential for the project. Thank you to Prof. Shankar Rao, for the tree walk and his volumes on the flora of the campus, which were an utter delight; thanks to Prof. Gadagkar, copies of these were gifted to me at the end of my Tanjore presentations; and also, to Ajay (Cadambi) for those endless conversations on music, art, history and queer-life.

More presentations followed. Thanks to Itty Abraham, I was invited to present a paper on Janaki at a conference on the history of science in India at the South Asia Institute, University of Austin, Texas, in May 2010. Soon after, I presented a paper, 'Doing Science Beyond the Nation: An Indian Woman Scientist in Britain in the War Years, 1939–1945,' at the *Making Britain: Visions of Home and Abroad 1870–1950 Conference* held in London, and organised by the British Library/University College, London/Oxford University/Open University (13–14 September 2010). A couple of months later, I was back in India, as B. Venugopal, then Director of the National Museum of Natural History, Union Ministry of Environment and Forests, had invited me to deliver the key note lecture at a national seminar on Janaki Ammal, held in the town of her birth, Tellicherry. Over the next few years, more public presentations were made: a paper at a symposium, 'Profiles in Twentieth Century India,' organised by INSA on the occasion of its 77th anniversary meeting at Tezpur, Assam, in December 2011, thanks to Prof. Gadagkar; a lecture on the occasion of the Botanical Survey of India's 125th Anniversary Celebrations at Kolkata in February 2015, thanks to its Director Paramjit Singh and (the late) P. Lakshminarasimhan; and finally, in 2016, thanks to M. Sabu, Head of the Botany Department, University of Calicut, I was invited to contribute to the lecture series organised in memory of Janaki Ammal, at the 28th Kerala Science Congress, Calicut, in January 2016.

Between 2017 and 2020, I worked on more drafts, each one remarkably different from the previous, a reflection of the jumps I was making in my thinking. I had resisted publishing anything all this time, not even a journal article, because I knew that would be hasty and even foolish, for Janaki had continued to be elusive. New and important sources were unearthed as late as 2020, followed by more intellectual wandering, reflection and rewriting, until I felt that Janaki had forgiven me for this deed.

Among the institutions and their staff in the United States and United Kingdom, without which/whom this book would not have been possible, particularly in these pandemic times, I would like to thank: The Bentley Historical Library and the University of Michigan Herbarium; the Smithsonian Institution Archives and the US National Herbarium; the Bancroft Library, University of Berkeley; Huntington Library, San Marino, California; Mount Holyoke College Archives, Mass. (thank you, Debbie Richards); Oakridge Nuclear Laboratory, Tennessee (big thanks, David M. Whittaker); in Britain, the Bodleian Library, Modern Paper Collections (thank you very

much, Colin Harris and the other staff); the John Innes Centre, Norwich (thanks a ton, Sarah Wilmot for all your help, warmth and kindness); the Kew Gardens Archives and Herbarium; the RHS Lindley Library; the RHS Wisley Collections; the British Library; the Wellcome Library; the Royal Botanic Garden, Edinburgh; and the Rothamsted Experimental Station, Harpenden. In India, I owe thanks to the Birbal Sahni Institute of Palaeobotany, Lucknow; the Botanical Survey of India Herbarium and Library; the National Archives of India, New Delhi; the Regional Research Laboratory, Jammu; and finally, in Chennai, the Centre for Advanced Study in Botany, the Senate House Library, University of Madras; *The Hindu* newspaper archives, and the collections of the Women's Christian College.

Several scientists, historians and the 'interested' have contributed in various ways, ranging from words of encouragement, reading the manuscript, providing useful information or documents: I would like to thank Oliver Darlington, Clare Passingham and Oren S. Harman (in particular for his biography of Darlington); M. S. Swaminathan (Chennai), the late S. K. Jain (Lucknow), E. R. S. Talpasayi and Y. Ranga Reddy (Hyderabad), V. P. Prasad (BSI), Chandra Mohan Nautiyal (Birbal Sahni Institute, Lucknow), Profs. Mahesh Rangarajan, Deepak Kumar, Sudhir Chandra (Nainital) and K. S. Manilal, and Karunakaran (Shoranur); the Jammu group including the late B. L. Bradu and Usha Zutshi and Y. S. Bedi; the Coimbatore group of T. V. Sreenivasan, Z. Abraham and A. William Jebadhas; and the staff at the Centre for Advancement Study in Botany, University of Madras—N. Anand, Durairaj T. Kalaichelvan, P. Nagendra Prasad, besides Durairaj Rajiah and Mayakannan. I also thank Ram Guha, Prof. Deepak Kumar and Jairam Ramesh for reading the manuscript and for their reviews. Prof. Arjun Appadurai showed eagerness to read it despite his very tight schedule, but unfortunately could not make it in time for the book.

For their kind words of encouragement, I am indebted to Margaret Rossiter, whose work has been a great inspiration to generations of historians studying women's participation in science, to Lee Kass for her publications on Barbara McClintock, and to Pnina G. Abir-Ram; I cannot thank Pnina enough for her empathy, perceptive reading and so readily agreeing to write a foreword.

Every line in the manuscript was read with care by Rivka Israel, who played no small role in making it more readable. My thanks also to Aakash Chakrabarty and Brinda Sen of Routledge/Taylor and Francis for their kind support and effort and dedication in seeing this volume through the press.

There were those who continued to fan my flames, despite the great stretches of time taken to complete this book, to them many thanks and warm hugs: it was in the company of Ram that I began my journey in search of Janaki; Shivaji, kept a daily conversation going for years; Chithra and Venkitesh, for their companionship in the early years; Girija, for her deep concern and empathy; and as always to Dilip, for being there, every time. To

Ramesh, my long-suffering co-traveller, memory bank and sounding board of ideas, and to Gayathri, Shambu and little Siddharth, much love. Thanks also to my family, and my in-laws, for their unfailing support through the years, but it is to my dear father, who passed on to me his love for nature (among many fond childhood memories are visits with him to the Lal Bagh Gardens, and its famed glass house), science, history, art and good design, and his high regard for Janaki Ammal and the work I was doing to resurrect her, that I dedicate this book.

Kidangoor (Kottayam)/London, March 2022

E. K. JANAKI AMMAL: A TIMELINE

1897 November 4	Birth at Tellicherry
1905–15	At Sacred Heart High School, Tellicherry
1915	Joins Madras College for Women (later called Queen Mary's College) for Intermediate Course (FA)
1917–21	BA (Hons.) at Presidency College, Madras
1921	Appointed Professor of Natural Science at Women's Christian College (WCC), Madras
1923	Awarded Master of Arts (MA), University of Madras
1924–26	Master of Science (Research) as Barbour Scholar, University of Michigan, Ann Arbor, USA
1926	Returns to India and resumes teaching at WCC
1928–31	Barbour Fellow at the University of Michigan
1930	Made full member of Sigma Xi
1931	Awarded DSc for her dissertation 'Chromosome Studies in *Nicandra physalodes*', supervised by B. M. Davis; Researcher at John Innes (May–August); elected to Linnean Society as Fellow
1932	Research Fellow, Department of Botany, Presidency College, Madras
1932	Reader in Botany, Chairman of the Board of Examiners in Botany, Member of the Board of Studies for Natural Science and Academic Council, and Member of the College Council, University of Madras

1932–34	Professor of Natural Science, Maharaja's College of Science, Trivandrum, Travancore
1934 January 21	Meets Gandhi in Trivandrum
1934–39	Sugarcane cytologist at Sugarcane Breeding Station, Coimbatore
1935	Elected Honorary Secretary of Indian Botanical Society; in August, leaves for England representing India at the Imperial Botanical Congress at Cambridge and attends the Sixth International Botanical Congress in Amsterdam
1939	Leaves for Edinburgh to attend the Seventh International Genetics Congress; takes refuge at the Institute of Animal Genetics, Edinburgh
1940–43	Researcher at John Innes
1944–46	War time work and Researcher, Kew Gardens on subsistence allowance
1945	*Chromosome Atlas of Cultivated Plants* co-authored with C. D. Darlington
1946–51	Cytologist, Royal Horticultural Garden, Wisley
1947 July	Attends Sixth International Congress of Experimental Cytology at Stockholm, visits Uppsala and Lund
1948 November	Returns to India by flight after nine years in Britain; leaves for Simla and then Raxaul en route to Nepal
November–December	Plant collecting expedition in Nepal
1949 March	Returns to Wisley
November	Meets Nehru; presents him with copy of Darlington's 1948 Conway Memorial Lecture
1950 January	Director of Agriculture, Government of India; elected to membership of Royal Geographical Society
April	Returns to Wisley
September	Attends meeting of the British Association for the Advancement of Science, Birmingham
1951 August	Attends meeting of the British Association in Edinburgh
1951 September–1952 October	Researcher, Genetical Laboratory, Institut National Agronomique, Paris

1952–54	Special Duty Officer, Botanical Survey of India, Calcutta
1953	Re-elected to the Linnean Society as Fellow
1954	Director of Central Botanical Laboratory (CBL); CBL moved to Lucknow
1955 April	Leaves for Oak Ridge, USA, on four-week course on tracer atom techniques
June	Awarded Doctor of Laws, University of Michigan; participates in the Wenner Gren symposium at Princeton on 'Man's Role in Changing the Face of the Earth'
1956 March	Attends UNESCO symposium on study of tropical vegetation, and another on problems of humid tropical regions, at Kandy
1956–57	CBL moved to Allahabad
1957	Elected to the Indian National Science Academy
1958 December–1959 January	Attends 24th annual meeting of the Indian Academy of Sciences at Baroda and 46th session of the Indian Science Congress at New Delhi
1959	Elected president of the Indian Botanical Society; retires as CBL director; appointed Officer on Special Duty by CSIR to organise RRL Jorhat and put in charge of Department of Cytogenetics, RRL Jammu
1960	Receives the Indian Botanical Society's Birbal Sahni Medal; becomes life member of Institute of Tropical Ecology and Research
1961	Elected President of the Indian Society of Genetics and Plant Breeding
1962	Appointed Honorary Professor at the Jammu & Kashmir University
June	Goes on a secret high altitude agriculture mission to Ladakh organised by the Ministry of Defence; inspects work done at the Murtse farm on food farming meant for Indian troops
1964	Appointed Emeritus Scientist, RRL Jammu

1966	Presents paper at international symposium on The Impact of Mendelism organised by Indian Society of Genetics and Plant Breeding, Delhi
1969 July	Term as Emeritus Scientist at RRL, Jammu, ends; leaves J&K
1969 October	Advisor, Biology Unit of the Bhabha Atomic Research Centre, Trombay
1970 October	Professor Emeritus at the Centre for Advanced Study in Botany (CAS), University of Madras; returns to the Department where she began, after 50 years; resides at the Field Research Laboratory, Maduravoyal.
1971	Begins developing a medicinal/ethnobotanical garden at Shoranur, Malabar; Principal Investigator of the Indian National Science Academy (INSA) project, 'Ethnobotanical Studies of South Indian Tribes,' based at Maduravoyal.
1972 September	Chairs meeting of the Kerala State Committee on Science and Technology at Trivandrum for the first time, to discuss an 'approach paper' for the Science and Technology component of the state's Fifth Five Year Plan
November	Delivers the Second Silver Jubilee Lecture, 'Plants and Man,' at the Birbal Sahni Institute of Palaeobotany, Lucknow
1973 September	Writes to INSA protesting against proposal to terminate the ethnobotany project in February 1974
1975 September	Ethnobotany project contract renewed by the University Grants Commission
1976 April	Travels to Jammu to present paper, 'India's wealth in medicinal and aromatic plants: its exploitation and improvement,' at the symposium on Medicinal and Aromatic Plants
September	Botanical tour of the monazite sands of South Travancore
1977	Awarded Padma Shri; as member of the official working group for ethnobiological

	studies in India, attends the first meeting to work out a national plan at New Delhi
July	Janaki attends the second meeting of the official working group for ethnobiological studies in India
August	Janaki sends a booklet protesting against Silent Valley dam proposal to Darlington
December	Government of India's Department of Science and Technology sanctions three-year project to bring out an illustrated book on South Indian Medicinal Plants (with special reference to Ethnobotany)
1978 June	Kerala government commences work at Silent Valley despite protests from the scientific community; the Department of Science and Technology sanctions a substation at Ashok, Shoranur
December	Travels to Meerut to attend the first conference organised by the Indian Botanical Society and presents paper entitled 'Ethnobotany: Past and Present'
1979	Delivers the third M. O. P. Aiyengar Memorial Lecture entitled 'Ethnobotany: Past, Present and Future,' at the University of Madras Works on producing a modern version of the *Hortus Malabaricus*; plans to set up a cytology laboratory at Ashok, Shoranur
1980	Proposes a second project to the Indian government entitled Cytogenetic survey of the flora of the Silent Valley; seeks permission to visit the Silent Valley for her project; unsuccessful
1984 February	Death in Madras

PROLOGUE

The southwest monsoon was utterly devastating that year, battering the whole of South India. Travancore, Cochin and Malabar suffered terribly. The waters had risen to such incredible heights, the apocryphal story goes, that people crossing on boats could easily pick coconuts off trees. Seen drifting about the waters were carcasses of animals, furniture and articles of domestic use.

The year was 1924. The unabating rains and gusts of blustering winds caused much destruction also in the cantonment town of Tellicherry on Malabar Coast; even as the great deluge drowned most parts of the town, a 27-year-old Thiya woman, burning with desire to become an exceptional scientist, was preparing to set out on her maiden voyage across the oceans to America. It was as if she had walked on water, or the rivers had parted for her, for unsubdued by the floods and devastation, she surfaced miraculously in Madras ten days later. Her boat had departed already for the shores of New York, but she would find a berth on the next steamer, and reach her university in time for her course. In 1931, when she was awarded a doctorate by the University of Michigan, she was the first ever Indian woman to achieve this academic milestone in the botanical sciences. Her name was Edavaleth Kakkat Janaki Ammal (4 November 1897–7 February 1984), whose long and tempestuous life in science is the subject of this biography.

Janaki's birth into a progressive Thiya family of Tellicherry coincided with the dawn of the disciplines of cytology and genetics, in which she would specialise.[1] Using cytogenetics, agronomy, plant geography, geology, history and anthropology together with a sound knowledge of the cultural uses of plants, Janaki mapped the origin and evolution of cultivated plants across space and time, to contribute to a grand history of human evolution. Her concerns were moulded not only by contemporary ideas in cytology and genetics, especially evolutionary biology, but also by the urgent need to provide an antidote to the aggressive nationalist strategies adopted by Indian agronomists in the name of food security and progress following India's independence. Janaki is without doubt a worthy subject for biographical exploration, on several counts, but three reasons are central to the present undertaking.[2]

A Project of Recovery

Almost all published sources on the history of women in science have had as their primary focus Europe and North America, with Asia, Africa, Australia and South America hardly figuring in them. Wiping clean this selective clouding of history, this biography marks the beginning of a grand recovery project, of Indian women in science. The subject of this biography was a pioneer and the only one among those Indian women born prior to 1900 to make a successful career of science, and yet remains largely unknown; in the year she was awarded a doctorate, there were only one or two Indian men who had doctorates in botany, and none at all in cytogenetics, which goes to show how exceptional her achievement was even for this reason alone. It is hoped that this detailed reconstruction of her life and science will, at the least, enable people to know Janaki and her science better, and at best, write her back into the history of science. That she was not alone on this journey is what her story reveals; the biography offers a glimpse of the heterogeneous and unanticipated landscape that existed even in the early decades of the twentieth century, one that was inhabited by women of science (and men of course) across nationalities, who tended to form a creative counterculture, constellation or sorority, of an informal or formal kind, spanning continents, and co-producing scientific knowledge. Each of these women were path-breakers and made a success of their careers in their chosen fields of science.

Janaki was the first Indian woman to receive a doctorate in botany as noted earlier, but the completely unknown Miss Maneck Merwanji Mehta was the first to do so in any one of the sciences, a feat she accomplished six years before Janaki.[3] This biography exposes the names of a number of Indian women studying science at the University, or even pursuing careers in science in the first decades of the twentieth century,[4] and sheds light on the constraints, particularly in these early years that they faced in accessing education, resources and employment in science. It thereby also draws attention to those men of science who played important parts in altering the gender and caste ratios at University departments, even as early as the 1920s. Men of science like T. Ekambaram, M. O. P. Aiyengar and, later, T. S. Sadasivan of the University of Madras, for instance, self-consciously used their scientific and official authority as successive directors of the University Botanical Laboratory to enlist women in scientific research and inspire them to publish their work, to which they gladly lent their names as co-authors. In this respect, there was much in common between the UBL and the X-ray crystallography laboratories of the Braggs in London and Manchester, which had more women students than men engaged in research,[5] and the British Marxist physicist J. D. Bernal's laboratory in Cambridge,[6] which was open equally to men and women.[7] It was however in direct contrast to the laboratories of Nobel-physicist C. V. Raman at the Indian Institute of Science and of the Indian astrophysicist Meghnad Saha in Calcutta, with their

preference for male students, to which some scholars in the recent years have drawn attention.[8]

A Twentieth-Century Life-World

A second reason that has propelled this extensive biography is that Janaki's story offers a defamiliarisation of the twentieth-century world. It reconstructs that world from the perspective of a pioneering and highly mobile Indian woman scientist, thereby renewing our perception of the socio-political and intellectual world of the times. Janaki's working life intersected with several significant historical events—the rise of Nazi Germany and World War II, the struggle for Indian Independence, the social relations of science movement, the Lysenko affair, the so-called green revolution, the dawn of environmentalism and the protest movement against a proposed hydro-electric project in the Silent Valley in the 1970s and 1980s, to highlight just a few. She corresponded with major personalities of the times, including political leaders like Jawaharlal Nehru, biologists like Cyril D. Darlington, J. B. S. Haldane and H. H. Bartlett, geographers like Carl Sauer, and social activists like Hilda Seligman, who all played significant roles in shaping her *weltanschauung* and her science. She was a participant in landmark scientific meetings and published prolifically in peer-reviewed Indian and international journals of science, most of which were founded during her lifetime, besides co-authoring a book, *Chromosome Atlas of Cultivated Plants* (1945), considered a bible by practitioners of the discipline. She would also be involved in the nation-building process, holding lofty public positions in her country of birth.

The understanding that science is shaped by the context in which it is created, or that science is as social as other kinds of knowledge, informs this biographical exploration. Janaki and cytogenetics were coevals (as were Barbara McClintock, Eileen Macfarlane and Irene Manton, to name three of the most eminent among early women cytogeneticists), and her science is a reflection of how the discipline changed its contours with the rise of the new Soviet State and its active encouragement of applied science (or state-led science), the advance of fascism and its abuse of science, and, eventually, World War II and the post-war reconstruction of the world.

Making Scientific Knowledge

This brings us to the third and perhaps the most important reason for this biography: to open a window into how science works.[9] When scientific 'discoveries' or scientific 'facts' are formally presented with a notion of objectivity, histories of actions or workings as well as the human touch behind these are eliminated, simply lost or rendered invisible in the narrative. In other words, they get black-boxed. To know how science works demands

'opening up' or 'unpacking' the black-box and making the 'messy' traces visible again.[10] Writing a scientific biography offers just such an opportunity. The biographee provides an axis about which to build a contextual history of how science is created locally, globally and also transnationally. Such a history takes on board the social, cultural and political contexts of science (the external social factors shaping science such as funding structures, institutions, political influences, peer reviews and bureaucracy, and the influence of caste, gender, class and race relations on the way scientific knowledge is shaped), the places and cultures of doing science (such as the laboratory and the field) and unabashedly 'the flesh and blood' or the human factors that fuel it—such as feelings, likes, dislikes, ambitions, ideas, ideologies, influences, friendships, career choices, idiosyncrasies, frustrations and joys—not just for the biographee but for all those integral to her social and professional worlds. In this sense, this is not just 'a' biography but a compound web of biographies, taking on a reticulate form (like a complex lace-like network) through which light shines bright on the system, the swarm of actors and the myriad ways in which scientific knowledge is constructed—in short, a global microhistory of a kind.[11] One of the things that this biography aims to demonstrate is that the history of modern genetics was not all about genes—or about Drosophila or Oenothera genetics—instead it was a pluralistic practice, involving a range of practitioners, aims, objects, techniques, styles and/or mixed cultures of doing science.[12]

Scientific biographies (one is here speaking of detailed reconstructions of lives in science based on archival material including oral histories, rather than popular accounts, short memoirs or journal articles) are a major lacuna in general, and in the Indian context in particular. Where such attempts have been made, the focus has chiefly been on the personal or the social, with little attention if at all to the content of their science or on science in action. This biography on the other hand undertakes the daunting task of 'following' Janaki's science—what she aimed to do, how she went about it, the strategies she adopted, what she accomplished and what she did not (her frustrations and failures)—situating it within a global history of plant genetics in the twentieth century. Her life cannot be written from within the 'Nobel-Prize' framework of finished science, for hers was not about making a seminal discovery of universal relevance (in cytogenetics, like a McClintock for instance),[13] but of producing a series of singular, small-scale and local discoveries, slowly and progressively, one concrete example after another—a necessarily slow and unfinished pursuit—, over a lifetime of wandering, which makes the task at once both thrilling and challenging to the biographer. Janaki's was a slow, small-scale, deep and thick or many-layered kind of science in the making. Worded differently, it alerts us to the fact that there are and have been other ways of doing science than those recognised by the Nobel Prize Committee, and that these deserve equal recognition if not more.

Also, at the centre of most accounts on Indian scientists are national institution-builders, or scientists of the state—invariably men, trained in the laboratory-based sciences of (nuclear) physics and chemistry,[14] representatives of the dominant model of doing science. On the other hand, probing the interstices, the borders, the folds or the dimly lit narrow bylanes of this heterogeneous landscape called science shines light on those like Janaki who chose to practise their science along the *holzwege*,[15] beyond the pathways determined and regulated by the state apparatus. Her science was about 'achieving personal perspectives while wandering, mostly, in the lonely byways of science.'[16] Following one's dreams across borders implied 'mobility,' which was not only a way of being but also of thinking. This biographical case-study shows that Janaki chose the liberating figure of the nomad as a way of being, and producing scientific knowledge, to break free of the tyranny of hierarchy, patriarchy and pseudo-science she encountered in the male bastions of state science such as crop breeding stations. She was a border-crosser in more ways than one, from her biological and social origins, to her nomadic subjectivity, her solitary travels of exploration and the nature of her scientific practice. Crossing borders and devising adventurous escapes made her life and science all the richer, and her story especially enthralling. Simply stated, this biography aims to reveal something of what it meant to live (dangerously at times) and make a career in the twentieth century as a nomad (woman) scientist.

If Janaki was a border-crosser, so were her objects of study. Way back in the nineteenth century, Jean Henri Fabre, the naturalist whom Charles Darwin referred to as 'that inimitable observer,' remarked that 'History celebrates the battlefields whereon we meet our death, but scorns to speak of the plowed fields whereby we thrive; it knows the name of the King's bastards, but cannot tell us the origin of wheat. That is the way of human folly.'[17] In a similar vein, or perhaps drawing on that, the feminist historian of science Londa Schiebinger stated that plants rarely 'figure in the grand narratives of war, peace, or even everyday life, despite their great relevance to mankind.'[18] This biography is no grand narrative, but is a story nevertheless, and has wandering plants at its centre, much as it has a nomad woman scientist at its heart. Alternating between the scientist's microcosm and the macro and public contexts of her scientific practice, this biographical narrative gradually unfolds to disclose, in parallel, the private and social lives of plants and their evolution and travels across landscapes in humans' trail—the story of the symbiosis between crops and humans, as articulated in Janaki's practice of science.

Janaki claimed multiple belongings as a nomad, the result of her deterritorialising wanderings (escapes) across myriad landscapes; she saw herself as a citizen of the world and as belonging to a transnational macrocosm of science, a view based on the belief that science knows no national, class or racial boundaries. This ontological position found epistemological

translation in her science, as archipelagic thinking (as opposed to continental thinking) which, disrupting the notion of insularity, viewed the world as a collection of interconnected islands rather than as closed continental forms.[19] There has been a rising interest in recent years in thinking with the archipelago (enriched by the insights of Antonio Benítez Rojo, Derek Walcott and Edouard Glissant),[20] but the focus has largely been anthropocentric (on studies of human migration for instance), whereas in Janaki's science, we have a robust example of how archipelagic thinking provided a new ecological and transnational perspective to the cytogeneticist studying plant migration, speciation and evolution. Her larger interest was in mapping on a planetary scale, the migratory patterns or wanderings of plants as they occurred in the footsteps of humankind.

Finally, life-writing is a labour of love, demanding on the part of the biographer not only enormous mental resources and great stretches of solitary time to befriend and know intimately her biographee, but also objectivity and caution so as to avoid hagiography, the pitfall of most biographies. Further, in non-Western societies, especially for those individuals long gone, it is almost impossible to find a well-organised archive of private papers, or even a semblance of an archive that could be employed for the reconstruction of a life, posing a huge challenge to the biographer. On one occasion in the present case, material was recovered serendipitously from a garbage heap, and on another fortuitously rediscovered by the biographer, after years of lying buried, thanks to a typographical error in the catalogue of one of the world's finest university libraries. Corralling archival material (although locating them was no easy task, one can't complain here of a scarcity of sources) over several years, almost a decade in this case, and then sifting through this trembling mountain of abandoned workings to discover nuggets of gold has without doubt been painstaking, but also immensely rewarding, something of which I hope will be reflected on the pages of this volume—the first in-depth and archive-based study of the life of an Asian woman scientist.

Notes

1 Unless the context demands, in which case her formal name 'E. K. Janaki Ammal' will be used, this narrative will address her throughout by her first name, Janaki. It may be noted that 'Ammal' was only a polite title (like Esquire, for instance), and not her surname.

2 The earliest biographical accounts (in English) of E. K. Janaki Ammal were penned by two of her junior colleagues, one a forest geneticist (Kedharnath, 1988) and the other a respected mycologist (Subramanian, 2007). While Kedharnath's short memoir nicely sums up Janaki's chief scientific contributions and provides an almost exhaustive list of her publications, Subramaniam's, derived chiefly from the former with respect to her science, includes his personal memories of Janaki. For more recent studies, see Damodaran (2013, 2017); adopting an intersectional approach (the entanglement of gender with such social

divisions as caste and race), the two papers are based almost exclusively (but for a few items from private collections) on the cache of letters sent by Janaki to the British cytogeneticist C. D. Darlington, held at the Bodleian Library, University of Oxford. Damodaran's accounts however shy away from addressing Janaki's science in any depth.

3 Miss M. M. Mehta completed her DSc in biochemistry from the University of London in 1925.

4 It may be noted that their presence was not as rare as some scholars have claimed. See for instance, Sur, *Dispersed Radiance*, p. 34. and Damodaran (2013).

5 William H. Bragg and his son, Lawrence Bragg, who shared a Nobel Prize in Physics in 1915; Kathleen Lonsdale and John Desmond Bernal were two of William's best-known students.

6 Dorothy Crowfoot Hodgkin and Helen Megaw were two of the best-known of Bernal's female students.

7 Ferry, 'Telling Stories or Making History?' and *Dorothy Hodgkin: A Life*.

8 Sur, *Dispersed Radiance*, pp. 179–219.

9 This is hardly the place for a review of literature on the biographical genre or its place in the history of science but for a selection of reading material see Govoni and Franceschi (eds.), *Writing About Lives in Science*, and the special volume of the *Journal of the History of Biology* 44, no. 4 (2011), especially Söderqvist, T. 'The seven sisters: subgenres of "Bioi" of contemporary life scientists', pp. 633–650.

10 This outlook and the language reflect an obvious influence of the constructivist turn in the history of science discipline or Science and Technology Studies. Reading material on the subject is vast, but for a sample, see Biagioli and Riskin (eds.), *Nature Engaged*; Sismondo, *An Introduction to Science and Technology Studies*; Jan Golinski, *Making Natural Knowledge*; Hacking, *Social Construction of What?*; Pickering (ed.), *Science as Practice and Culture*; Latour, *Science in Action*.

11 The term global microhistory was first used by historian Tonio Andrade in his article, 'A Chinese Farmer, Two African Boys, and a Warlord: Towards a Global Microhistory'.

12 For a collection of essays written from within this perspective, see Campos and von Schwerin (eds.), *Making Mutations*.

13 For biographies of Barbara McClintock see Comfort, *The Tangled Field*; and Keller, *A Feeling for the Organism*.

14 For a sample see Chowdhury, *Growing the Tree of Science*; Shah, *Vikram Sarabhai*; Dasgupta, *Jagdish Chandra Bose and the Indian Response to Western Science*.

15 A reference to German philosopher, Heidegger's *Holzwege* (1950), literally meaning wood-paths, forest-ways, or off the beaten tracks.

16 Astrophysicist S. Chandrasekhar's speech at the Nobel Banquet, 10 December 1983. www.nobelprize.org/prizes/physics/1983/chandrasekhar/speech/

17 For a note on Jean-Henri Fabre see *Nature*, 96 (1915): 204–205.

18 Schiebinger, 'Following the Story', p. 49.

19 Since the 1950s, literary and cultural studies scholars, historians, sociologists have employed the concept of the archipelago to deconstruct linear narratives of historical and national development. For an introduction, see Pugh, 'Island movements: Thinking with the archipelago'.

20 For a recent collection of essays which explore archipelagic thinking across disciplines, including biology, see Martínez-San Miguel and Stephens (eds.), *Contemporary Archipelagic Thinking*.

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1

TELLICHERRY

A Modern Thiya Family

> The country is extremely pleasant . . . and the weather at this season delightful. Indeed, the climate of Tellicherry is reckoned one of the finest in India, and the winds are generally moderate, the sea breezes cool and refreshing. A constant trade during the fair season, with vessels of all descriptions from different parts of India, renders this settlement very lively while the number of civil servants, with the garrison officers and their families, beguile the rainy months in cheerful society and domestic enjoyments.[1]

Travelling through Malabar in the late eighteenth century, James Forbes, an East India Company official and amateur artist, was deeply taken in by the extraordinary richness of the landscape in Tellicherry. Forbes found the country pleasant for excursions and the weather at that season 'delightful.' He observed: 'Indeed the climate of Tellicherry, in the latitude of 11° 47′ north is reckoned one of the finest in India.'[2] A salubrious and picturesque town, it was 'situated upon a group of low wooden hills running down to the sea, and protected by a natural breakwater of basalt rocks.'[3]

A traveller in the mid-nineteenth century described Tellicherry as 'a pretty little straggling town on the sea-coast of Malabar, between the considerable military cantonment of Cananore and the French settlement Mahe.' It was divided into two parts, one the 'flat ground' constituting Tellicherry proper, almost at level with the sea, and 'the high ground,' called Dharmadom. The town consisted of about two hundred 'irregularly-built' European houses, bazaars, the market place, an expansive prison 'built on a lofty bastion facing the sea, which includes the dens for criminals and the debtors' gaol,' a lunatic asylum, the Zillah Court, and a chapel, besides a Catholic chapel and a Protestant church. The burial grounds were 'situated on a high mound nearly overhanging the sea.' Between the outer limits of the town and Dharmadom were a 'few straggling country-houses, and the court-house of the now no longer existing judges of circuit who were three in number, besides the registrar.' Dharmadom was itself located on the 'lofty cliffs and high tableland' on the banks of a 'rapid and deep' stream, consisting 'of a few

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scattered villages, occupied almost exclusively by native fishermen, and two immense mansions, more like palaces than private houses, and therefore the residence of two of the judges stationed at Tellicherry.'[4] Near the sea-beach were extensive oyster-beds, and during low-tide, one could feast on oysters to one's heart's content. Tellicherry was famous for its pepper (as it remains today), most of which was dried on the spot for export. It was the headquarters of the pepper trade in Malabar. A great number were involved in the curing of coffee and ginger, again for export trade. Tellicherry was also well-known for its superior quality cinnamon, procured chiefly from the Randattara estate. Besides these, fruits, vegetables and poultry were always aplenty.

In 1844, the colonial government in India made knowledge of English a requisite for employment in government service. This new demand came as a blow to the vernacular-educated upper castes in Malabar under the Madras Presidency, chiefly Namboothiris and Nairs, who owing to caste inhibitions were less inclined to learning English. The Thiya community on the other hand, despite occupying the lower rungs of the caste ladder, embraced English education wholeheartedly. As a result, the turn of the twentieth century saw the burgeoning of a Thiya middle-class that was both English-educated and proficient in the vernacular and Sanskrit languages (the study of Sanskrit was by no means restricted to the upper castes as elsewhere), and cosmopolitan in outlook and taste. It was a colonial modernity marked by such activities as reading books in leisure time (the Malayalam novel was after all a product of these times), treating guests to a fusion cuisine of sorts, playing lawn tennis, badminton and cricket, indulging in exercise routines such as the one marketed by Eugen Sandow, resorting to a combination of Western and indigenous medicine to treat ailments, educating their children irrespective of gender, playing the piano, while also being connoisseurs of classical South Indian music and performances like Kathakali and Thullal, and very importantly keeping a daily journal, with entries on weather and books read, besides everyday happenings.

> The Thiyas have always been characterised by their persevering and enterprising habits. A large percentage of them are engaged in various agricultural pursuits, and some of the most profitable industries of Malabar have . . . been in their hands. They are exclusively engaged in making toddy and distilling arrack. Many of them are professional weavers, the Malabar *mundu* being a common kind of cloth made by them. The various industries connected with cocoanut cultivation are also successfully carried on by the Thiyas. They have among them good Sanskrit scholars, whose contributions have enriched the Malayalam literature; physicians well versed in Hindu systems of medicine; and well-known astrologers, who are also clever mathematicians. In British Malabar, they have made considerable progress in education. In recent years, there has

> been gaining ground among the Thiyas a movement, which has for its object the social and material improvement of the community. Their leaders have very rightly given a prominent place to industry in their schemes of progress and reform. Organisations for the purpose of educating the members of the community on the importance of increased industrial efforts have been formed.[5]

Ideas of 'purity' and 'pollution' were simply 'antithetical to middle-class modes of life and work,' Andre Beteille has observed.[6] The Thiyas were mindful of being a cohesive and regulated community like the upper-caste Nairs and even claimed an equal status with them.[7] In fact, a contemporary Thiya writer and thinker Murkoth Kumaran criticised the Malabar Resident William Logan for his failure to highlight the Thiya social order in his *Malabar Manual*, an order that was as robust and socially evolved as that of the Nairs.[8] Thiya students leaving for higher studies in Madras, for instance, always sought the blessings of the elders in the community, who on their part ensured moral and financial support for the youngsters in their journeys towards progress. Graduates in Malabar were few in the late nineteenth century, but a good number of them were Thiyas; newly graduated Thiya boys were taken in procession through the town with nagaswaram and other musical accompaniments to give them a sense of having achieved an important goal. Employment in government service, which offered a sure means of liberation from the discriminating caste system, was an opportunity not to be missed.[9] By the late nineteenth century several Thiya gentlemen had attained high positions in government service or as independent professionals (chiefly as advocates); the names include Tahsildars Churyayi Canaren, Onden Kunhambu and Karayi Govindan; Deputy Collectors Uppota Kannan and Churyayi Kanaran; lawyers Potheri Kunhambu, Kottieth Ramunni, Churyayi Kunhi Kannan and Oyitti Krishnan; the Tellicherry Municipal Secretary Adiyeri Chathu; and then there was Justice Cheruvari Krishnan of the Madras High Court and the Sub-Judges, Panangadan Kannan and Edavaleth Kakkat Krishnan, the latter being Janaki's father.

Sub-Judge Edavaleth Kakkat Krishnan

E. K. Krishnan (1841–1907), on his maternal side, hailed from the ancient Thiya family of Oracheri at Chokli near Poyiloor in Tellicherry, a Municipality on the Malabar coast in the northern district of Cannanore (Kannur) of today's Kerala, renowned for its Sanskrit and Malayalam scholarship and expertise in medicine and astrology.[10] The oldest known member of the family was one Oracheri Kannan Vaidyar. He sired three sons, Kunhi Kannan, Chathappan and Othenan, and had two nephews, Kunhi Koran and Kunhi Chandan—the fivesome, owing to their scholarly reputation, were addressed collectively as the *Gurunathanmar*. The eldest, Kunhi Kannan, in his old age

played *munshi* to German Basel missionary and lexicographer Dr Hermann Gundert (1814–93), teaching him Sanskrit and Malayalam. This association eventually led to the production in 1872 of the first ever Malayalam-English dictionary. In his *Tagebuch aus Malabar*, Gundert described 'Cugni Veidyen' (Kunhi Kannan Vaidyar) as an 'einfältiger Forscher' ('a simple-minded researcher,' in this case, teacher) who was helping him prepare a book on Malayalam grammar.[11] Besides the Oracheri *Gurunathanmar*, there were other well-known Thiya scholars in Tellicherry and its neighbourhood, men like Bapputty Gurukkal, Anandan Gurukkal, Canaren Vaidyar and Churukantan Vaidyar, who were all taught, incidentally, by so-called upper-caste teachers such as Kuttiappa Nambiar. That Gundert chose a man belonging to the Thiya community as his teacher rather than someone from the upper caste, tells us something not only about Gundert, the Protestant missionary, but also about Thiyas in general, who interacted with Westerners with ease, unconcerned about matters of pollution.

The second nephew of Oracheri Kannan Vaidyar, Kunhi Chandan (a cousin of Gundert's teacher Kunhi Kannan Vaidyar), chose Aroonda Neeli of Valiyayi as his partner; Neeli bore him two children, Kunhikutty and Cheeru. Aroonda Cheeru was given away in marriage to Kakkat Kungen Vaidyar, a renowned Ayurveda physician from Mayyazhi (or the French principality of Mahe); they had three children, daughters Neeli and Manikkam, and an only son, Krishnan (the future Sub-Judge). Krishnan was born on the 6 June 1841, within six months of the death of his grand-uncle Kunhi Kannan Vaidyar, teacher to Gundert, who to the missionary's great regret had died 'ohne Christum bekanntzuhaben' ('without knowing Christ').[12] Contrary to the *marumakkathayam* (matrilineal) norms adopted by the Northern Thiyas, Krishnan took his father's family name, Kakkat, rather than his mother's, Aroonda, marking a break with tradition.

Krishnan completed his preliminary studies at Calicut in the Government Provincial School (established by the Zamorin in 1854), where he spent five years of his youth.[13] It was open to all classes of society and taught English, Malayalam and Sanskrit.[14] Krishnan was the recipient of the coveted Junior Conolly Scholarship, instituted in the name of the murdered Malabar Collector and Magistrate, Henry Valentine Conolly.[15] The Head Master of the School, Edmund Thompson, considered Krishnan 'the best English Scholar' among the natives who had studied at the institution, one who had 'read many works quite unconnected with the ordinary course of School study' and had 'obtained thereby a good deal of general information.'[16] In 1861, Krishnan entered government service as English Writer at the Civil Court, Tellicherry (Thalassery), and three years later was appointed Malayalam Translator at the Madras High Court. The Registrar Philip Percival Hutchins and the Acting Registrar Herbert Wigram of the Huzur Court of Madras certified Krishnan as a highly intelligent and well-educated young man, and an excellent Malayalam Translator.[17] Krishnan passed the examinations for the

office of 'Translator, Judicial Sheristadar and District Munsiff,' and in early 1869 was awarded a Bachelor of Law degree by the University of Madras.

Tellicherry's legal history might be traced back to 1802, when the first Zillah Court was established by the British. This institution was later upgraded as the Civil and Sessions Court and the Principal Sadir Amin's Court in 1845. In 1873, it was referred as the District and Sessions Court, and William Logan (1841–1914) was appointed Judge. Krishnan's tenure as District Munsiff of Tellicherry gave him ample opportunity to interact with his coeval Logan (both were born 1841), who would later be appointed Malabar Collector. Logan's *Malabar Manual* (1887) would occupy pride of place in Krishnan's library. Krishnan had been Munsiff at Tellicherry for some years, when he decided to compete for the superior post of Sub-Judge; in late 1883, he received a telegram notifying him of his elevation to the position of Sub-Judge at Calicut. The District Judge of Malabar, John William Reid, in his testimonial stated that Krishnan had 'sustained up to this the high character for integrity,' an opinion Reid had entertained of him when he had first given him a testimonial in August 1875, in his application for the post of Munsiff. Reid had then hoped that Krishnan's successes would act as an incentive to those natives who ceased to pursue studies quite early in their lives. In late 1892, Krishnan was posted as Sub-Judge in Palghat, where he would remain until his retirement in 1896. At the end of his official tenure as Sub-Judge, Krishnan would re-enter government service as Deputy Collector of Tellicherry, eventually retiring in 1901. From then on until his death in 1907 Krishnan would serve as Chairman of the Tellicherry Municipality.[18]

Sub-Judge E. K. Krishnan wielded immense power and influence over the Thiya community in Northern Malabar, given his official position, sense of judgement, and vast and eclectic erudition. He enjoyed a wide network of friends and acquaintances from the top rungs of the social ladder, a veritable 'Who's Who' of the region, including highly placed Indians, colonial officials and other Europeans of the station. He refused to be part of any caste or religious organisation, and thought of himself an agnostic. Krishnan was the epitome of the newly emerging indigenous reading public in Malabar; he was a voracious reader of diverse literature, from fiction and poetry to non-fiction, history, government manuals and legal tracts, in English, Malayalam and Sanskrit. At his house, there was a designated space for a library, complete with revolving book stands and walls lined with wooden book shelves, which were fumigated regularly to keep out pests and mould so widespread in the humid tropics. An avid gardener, with a partiality for hibiscus and mangoes, and amateur ornithologist, Krishnan published two books on the birds of Malabar (one of these exclusively devoted to the birds of Tellicherry)[19] as if in continuation with the Scottish surgeon T. C. Jerdon's researches in the region at the turn of the nineteenth century.[20]

In 1867, while employed as Malayalam Translator at the Madras High Court, Krishnan married Kalyani, daughter of Poovadan Kelu of the

Kuruntharatta House. The marriage was a small affair, having aroused much displeasure among his relatives, especially on his paternal side, for they had hoped he would marry one of his cousins, as per custom. Kalyani however died young, leaving Krishnan with two little ones to fend for, a girl called Sharada and a boy, Govindan, a dire situation which forced him to marry again. By this time, Krishnan had also taken charge of the Edavaleth House, Mahe, his paternal *tharavad*, which had been in the hands of strangers and distant relations. The bride this time was Devaki Amma, a young girl of mixed-race parentage, more than twenty years his junior, of Kuruvey House in the old part of Tellicherry town.

Kuruvey Devaki Amma

On 18 March 1895, the *Madras Mail* carried an obituary notice of Lt. Col. John Child Hannyngton (1835–95), who had died at the age of fifty-nine on 25 February at Lewisham, London. He was a victim of the influenza epidemic that had peaked in England and was spreading at an alarming rate owing to 'a long spell of severe weather' lasting sixteen weeks.[21] The news would bring great grief to Sub-Judge E. K. Krishnan, who recorded the event faithfully, but simply, in his diary: 'I well remember being photographed by this genial European in 1862. He kept up a correspondence with me.'[22] Krishnan was a junior Court official in Madras during Hannyngton's five-year sojourn in Tellicherry, but they had had several opportunities to interact both within judicial circles and otherwise.[23] The two men shared a professional and intellectual bond but also a certain guarded intimacy, not ordinarily expected of an Indian subordinate and a British superior, for Hannyngton was also father-in-law to Krishnan, albeit publicly unacknowledged.

In the nineteenth century it was not uncommon for Thiya women to enter into liaisons with low-ranking British men in the military or civil service; in these times this was not thought of as 'improper' or leading to a 'loss of caste.' Thurston noted:

> the marumakkatāyam system (inheritance through the female line), which obtains in North Malabar, has favoured temporary connections between European men and Tiyan women, the children belonging to the mother's tarvad. Children bred under these conditions, European influence continuing, are often as fair as Europeans. It is recorded in the Report of the Malabar Marriage Commission, 1894, that 'In the early days of British rule, the Tiyan women incurred no social disgrace by consorting with Europeans, and up to the last generation, if the Sudra girl could boast of her Brahman lover, the Tiyan girl could show more substantial benefits from her alliance with a white man of the ruling race. Happily, the progress of education, and the growth of a wholesome public opinion, have made shameful

> the position of a European's concubine, and both races have thus been saved from a mode of life equally demoralising to each.'[24]

The incidence of such liaisons was particularly conspicuous in cantonment towns like Tellicherry, observed William Logan in his *Malabar Manual* (1887):

> The head-quarters of the [Thiya] caste may be said to lie at and round the ancient European settlements of the French at Mahé and of the English at Tellicherry. The women are not as a rule excommunicated if they live with Europeans, and the consequence is that there has been among them a large admixture of European blood, and the caste itself has been materially raised in the social scale. In appearance some of the women are almost as fair as Europeans, and it may be said in a general way that to a European eye the best favoured men and women to be found in the district are the inhabitants of ancient Kadattunad, Iruvalinad, and Kottayam, of whom a large proportion belong to the Tiyan or planting community.[25]

Our story begins with one such Thiya girl, Kunhi Kurumbi (1845–1918) of the Kuruvey family, except that her liaison was not with the rank and file but with the Judge of the Court of Small Causes at Tellicherry, none other than J. C. Hannyngton. The Irish-born Hannyngton was the son of Major General John Caulfield Hannyngton, inventor of the Hannyngton Slide Rule used in astronomical computations and Fellow of the Institute of Actuaries. He joined the Madras Civil Service in 1857, the career ending in 1892, a major part of which was spent on the west coast of South India. In 1878, he acted as the Resident of Travancore State; a short stint in early 1879 as District and Sessions Judge in Salem was followed by an assignment in December 1880 as arbitrator of boundary disputes between the States of Travancore and Cochin. In 1881, he was once again appointed Acting Resident, before leaving on special duty and accompanying the Maharaja of Travancore on his tours to Calcutta, Banaras and Madras. His official post was confirmed in 1882 and from then on until his retirement, save for short intervals, Hannyngton served as the Resident of Travancore and Cochin States.[26] A popular personality, he was considered a Sanskrit scholar of repute, a keen sportsman and 'a capital shot not only with gun and rifle but with camera and lens.'[27] He was also passionately interested in natural history, especially botany; in the 1880s, for instance, while Resident of Travancore, he sent a collection of 'orchid roots' from the Western Ghats, growing at an elevation of 3,000 feet, to the Director of Kew Gardens, London.[28]

Young Hannyngton's liaison with Kuruvey Kunhi Kurumbi led to the birth of two girls at the Kuruvey House: Devaki (1864–1940) and another of uncertain name, perhaps Matha (1865–89). Hannyngton would not

publicly acknowledge the girls. The heart-wrenching story goes that within a couple of weeks of Matha's birth, the baby was forcibly taken away to Madras for adoption. The elder girl Devaki escaped a similar fate because she clung desperately to her mother, refusing to be separated. The adoption plan had been masterminded by Hannyngton, then Sessions Judge at Salem. On 24 March 1866, immediately after Matha's adoption, he married a nineteen-year-old English girl, Laura Elizabeth Onslow.[29]

Perhaps it was also Hannyngton who suggested to Krishnan, when the latter was Munsiff at the Tellicherry Court, to marry his elder daughter, Devaki; he had high regards for Krishnan, knew he could keep a secret and take good care of his daughter. As for Krishnan, he was more than pleased with the suggestion, and sometime after October 1879, began a *sambandham* with fifteen-year-old Devaki; she was twenty-three years his junior, but the age difference was hardly surprising for the times. In 1890–91, Krishnan built a grand *padinjitta* (a west-facing house) called Edathil (or Edam) in Chetamkunnu, Tellicherry, not far from the Courts and the sea, and in close proximity to Kalathil House, the house he had built for his first wife, Kalyani and their two children, E. K. Sharada and E. K. Govindan (1875–1944). Devaki Amma (called Devi Amma, and referred to as Mrs K in Krishnan's diaries) would bear him thirteen children in all (seven boys and six girls); the initials in their names stood for Edavaleth Kakkat (taking after the paternal family name, rather than the maternal, the latter being the case in matrilineal Thiya families): E. K. Damodaran (1879–1904), E. K. Lekshmi (1881–1952), E. K. Raghavan (1882–1973), E. K. Vasudevan (1885–1936), E. K. Krishnan (also known as Kunhi Krishnan or Kittu) (1887–1958), E. K. Cousalya (1889–1971), E. K. Parvathi (1891–1984), E. K. Sumithra (1892–1972), E. K. Padmanabhan (1894–1974), E. K. Janaki (1897–1984), E. K. Madhavan (1899–1967), and the twins, E. K. Devayani (1902–80) and E. K. Varadan (1902–59).

Janaki's Early Years

Krishnan and Devi Amma had their marriage registered on 13 July 1897 before the Registrar of Marriage, Tellicherry, as per the 4 November 1896 Act of Madras; she had by this time given birth to nine of their children. The year ended for them with the birth of yet another, a girl named Janaki born on 4 November 1897. In early 1898, only a few months after her birth, the colonial government conferred Krishnan with the title Diwan Bahadur. The birth certificate issued by the Tellicherry Municipality recorded Janaki's date of birth as 5 November, a discrepancy that might have arisen from a conversion of the date from the lunar calendar to the Gregorian; however, the date Janaki herself cited in official documents was 4 November 1897.

Little Janaki was fondly called Jani. An entry from Krishnan's diary of mid-1899, records: 'Baby Jani is [a] . . . pet in the family. She is growing

a great beauty . . . Jani is very amusing & eats betel nut freely.' Krishnan would frequently take little Jani on drives in his four-wheeled carriage, which included dropping off her elder sisters at the local convent school for girls. On one occasion, on 18 February 1901, brother Kittu after seeing his sisters off at school took three-year-old Jani, who had suddenly taken ill, to the hospital on his *jutka* drawn by two bullocks. A couple of months later, on 16 April 1901, her ears were pierced in a *kathu-kutthal* ceremony as per custom. That same month, Krishnan would receive the good news of E. K. Damodaran, his eldest son with Devi Amma, having passed the MB&CM examination of the Madras University, the first one to do so among the Thiyas. Krishnan, the proud father, attended a dinner party hosted by V. Karunakara Menon (a lawyer and honorary Managing Director of the Cosmopolitan Club, Calicut) at his house in the company of friends, District Munsiff Mundappa Bangera (with whom he went on drives too), Adiyeri Chathu, Kottieth Ramunni *vakil* and Mangat Gopala Menon, the new Municipal Chairman. The friends had a brief chat before they sat down to a dinner 'consisting of some of the nicest dishes of Malabar prepared by Menon's servant, including *sambar*, *koottukari*, *avial*, *mangakari*, *rasam* followed by *payasam*.' Karunakara Menon and Gopala Menon would in turn visit Krishnan; this time it was a grand Thiya fare, comprising mutton soup, fish moilee, mutton cutlets, duck roast and rolong *pilao* (a spicy *pilao* made of semolina or *sooji*),[30] and 'fine old whiskey to wash it down well.' On this occasion son Damodaran was introduced to them as a 'private practitioner.' The children including Janaki and her toddler brother Madhavan were kept entertained at such times by being driven around the house in a hand-cart.

On 6 June 1903, Krishnan turned sixty-two: 'I enjoy fine health with no organic disease. All my children are with me,' he recorded in his diary, in obvious contentment. That very month, a private tutor, Kunger *kanisan* was hired to teach the six-year-old Janaki the Malayalam alphabet.

The following year, in his journal dated 28 April 1904, Krishnan noted, 'This is an eventful day in my family. Sumithra and Janaki [now almost seven] and their cousin Narayani daughter of Rugmani had the Talis tied round their neck.' Within the *marumakkathayam* system, every Thiya girl of North Malabar was to undergo this *rite de passage* called *tali-kettu-kalyanam*, wherein a *tali* ('a small, thin, gold, neck ornament, with a gold bead on either side of it, and attached to a string made of cotton-thread') would be tied around her neck by her aunt, before she attained puberty so as not to 'lose caste.'[31] Subsequent to this ceremony, the girl would be formally addressed with the honorific title, 'Amma' or 'Ammal'; it appears that only Janaki among the EK sisters chose the title 'Ammal' for herself. The ceremony, being an expensive affair, was usually conducted for several girls of the family together, by they had to be an odd number of years old (5, 7, 9, or 11); postponement beyond the age of 11 years

was not considered appropriate.[32] An auspicious day and hour for tying the *tali* would be fixed beforehand in consultation with the *kanisan*, or *kaniyan*, the astrologer. Summing up the evidence laid before the Malabar Marriage Commission of 1891, Thurston wrote about the ceremony thus: 'Of those who gave evidence before the Malabar Marriage Commission, some thought the tali-kettu was a marriage, some not. Others called it a mock marriage, a formal marriage, a sham marriage, fictitious marriage, a marriage sacrament, the preliminary part of marriage, a meaningless ceremony, an empty form, a ridiculous farce, an incongruous custom, a waste of money, and a device for becoming involved in debt.'[33] That Krishnan supported such customary practices despite his progressive outlook comes as a surprise, but perhaps for the elite Edathil girls going through the ceremony was crucial, to rid them somewhat of the social stigma, or the 'white-stain' on their maternal side that tainted the reputation of the family.

Sumithra, Janaki and Narayani, dressed up in *thangakasavu* (gold zari) bought at the Cannanore bazaar from 'Camp' Rameshwara Aiyer's shop, and accompanied by five or six women, were taken in procession to the Keloth family accompanied by music, from thence to the Cannanore Road by Komachankandi Lane and then back to Edam through the old Pallikunnu Road. The ceremony lasted four days and at its close the girl had the freedom to dispense with her *thali* if she so wished. While Sumithra and Narayani would be married off to Thiya gentlemen a few years later, Janaki chose to remain unmarried and would officially be addressed as E. K. Janaki Ammal.

At School

With E. K. Krishnan's death in 1907, a great cloud of gloom descended over Edam. The grand life had come to an end and the family had fallen on bad times; Devi Amma was inconsolable, for her eldest son Damodaran, the doctor, had died tragically in 1904 of the plague, and the younger children had got nowhere in life. The eldest of her surviving sons, E. K. Raghavan, the family's sole bread-winner, was residing at Gyogin in the Insein Township, Northern Rangoon. A responsible and loving son, Raghavan would send monthly remittances for the upkeep of Edam, and the education of his younger siblings (Madhavan, Janaki, Varadan and Devayani), but he had only started off, and his earnings were far from sufficient. By then Janaki had joined her sisters Parvathi and Sumithra at the Sacred Heart High school in Tellicherry, but drastic changes were inevitable at Edam: Krishnan's carriage was to be sold off to the Munsiff residing at the Kalathil House. Three of his guns, which had been kept at the Taluk Cutcherry for renewal of licence, had to be disposed of. The cook Raman had already quit and his wife was expected to follow suit as Devi Amma was no longer able to employ them. Some

of Krishnan's precious volumes such as the *Encyclopaedia Britannica* were offered on sale.

The nuns at school encouraged the girls to pursue higher education rather than view marriage as the end. They taught them the importance of maintaining daily journals (unfortunately Janaki did not keep one) and communicating clearly and confidently, in both English and Malayalam. Sometimes they visited the girls at home to check on their welfare. Besides studies, the girls took an active part in extra-curricular activities, such as acting, music, needlework and embroidery. The EK girls would have fond memories of school, which would prepare them in several ways to become formidable women, each in their own way. The girls all read English novels and books on natural history borrowed from their erudite father's personal library. They knew their plants and birds well and occasionally enjoyed angling.

In a few years' time, Raghavan's younger brother, Vasudevan would find a job with the police department, and Kittu with the forest service. Kittu had completed his BA from the Presidency College, Madras (specialising in botany) in 1909–10, in a commendable second class; before being sent to Dehra Dun on the usual three-year course, a probationer of the forest department had to spend six months as an Attached Officer in a District Forest Department. Accordingly, in early 1911, Kittu left for Ootacamund (Ooty), soon to be joined by Devi Amma and the younger children, who were on summer vacation. 'Though it is very cold the country is delightful,' fourteen-year-old Janaki wrote from Ooty to brother Raghavan in Burma. The family visited the Botanic Gardens, which they all loved. She also wrote about the hail storm they witnessed there: 'Some two days ago hail as large as marbles fell here. We all ran out to pick them. It was really lovely.' The cold was somewhat extreme however, and Devi Amma was desperate to return to Tellicherry. Janaki's letter to Raghavan ended with a request for an instrument box to be used at school, containing a compass, divider, ruler, protractors and a pair of set-squares. 'They can be got at Spencer & Co.,' she added very helpfully.[34]

In 1913, Janaki was in the Fifth Form. Her steadfastness, industrious nature and keen eye for detail were already evident. A descendant recalls a telling moment from her early years at school. When the visiting School Inspector asked the class to identify the plant displayed before them, a youthful Janaki without a moment's hesitation answered, much to the Inspector's delight, that it was a *Gloriosa superba*, the very plant that had captured James Forbes' attention when he visited these parts in the late eighteenth century.[35] Plants would become the centre of her life.

Janaki's elder sister Sumithra was a great support to Devi Amma; she was extremely resourceful and industrious, even if somewhat of a disciplinarian. Every day, she would toil hard to ready her younger siblings for school. On some days, young Janaki assisted her elder sisters in pounding

rice and preparing breakfast for several members of the household.[36] Sumithra would however make time to read English novels, the likes of Allen Raine's *The Queen of the Rushes* (1906)[37] and Dickens' *David Copperfield*. Interested in the English language, she would miss no opportunity to teach herself new idioms and words, and help her younger siblings with their homework, especially Janaki. In 1913, we find her reading novels such as *Destiny* by Alice and Claude Askew (1911) and Charles Gravis' romantic melodrama, *My Love, Kitty* (1911) as well as Malayalam ones such as Murkoth Kumaran's *Vasumathi*, a novel based on Thiya life, which she found, 'interesting' but written in 'very difficult Malayalam.' One entry in her diary records that she had spent the 'whole morning in copying English notes for Jani—idioms & meanings from Sr Letitia's notebook,' which had turned out to be 'instructive' for her. Sumithra observed wistfully and not without a hint of envy, that Janaki was improving her English 'by leaps & bounds & has adopted a flowery style of language from Sr Letitia,' while her own English, especially pronunciation, was 'being slowly forgotten.' Janaki had in fact received a long letter 'full of praise' from brother Raghavan for her facility with the English language. Referring to herself, Sumithra would remark with regret: 'What a shame to be master of no language!' It was indeed from Janaki, who had learnt it at school, that Sumithra learnt the Scottish ballad 'Jessie's Dream' or 'The Relief of Lucknow' adapted for the pianoforte.[38]

In the absence of Sumithra, who would occasionally go to Tayilekkandi (aunt Kalyani's house, in the old part of town, where youngest sister Devayani resided),[39] it fell on Janaki to prepare her younger siblings and nieces (daughters of elder sisters Lekshmi and Cousalya) for school. The girls left for the convent every weekday at eight in the morning 'at breakneck speed under Jani's orders.' The older girls including Janaki wore saris, and walked to school, while the younger ones went by *jutka*. Occasionally, an ill little Devayani would be brought back home by Janaki in a *jutka*; the girl was prone to vomiting and weakness. Tired and over-worked, Janaki would at times sulk and go to bed without dinner, especially after a quarrel with the ever dominating Sumithra, and at others stay back at the convent. Sumithra, who enjoyed needle and crochet work, stitched 'nainsook' (fine, soft cotton) blouses for herself, and for Janaki, soft muslin and chintz blouses, besides laced handkerchiefs. She would also make *ravikkas* (blouses) for Devi Amma, who was addressed as 'Ma' by her children. Sumithra would teach Janaki to make pillow-lace, a kind of hand-made lace worked on a pillow using threads wound around bobbins.

The struggle for money led to frequent quarrels at Edam, leaving Devi Amma miserable and anxious. Sumithra would write: 'Lamentations & noise. Edam is disgraced!. . . No peace or money in the house & everyone is miserable.' She blamed herself for 'keeping anger to heart.' One day, Janaki made a scene before starting for school. She had purchased a 'Mangalorean

sari' without her mother's permission. When Devi Amma lost her temper and refused to pay up, sisters Parvathi and Sumithra were forced to intervene. They lent Janaki the Rs 3 that she so desperately needed to repay her loan. 'Jani is too independent and has no fear of debts. This is a lesson,' Sumithra would comment. On the other hand, she greatly admired Janaki for her 'perseverance' and generosity.' For instance, she would religiously take an oil bath every morning in the auspicious month of *karkadakam*, which none except her father did. Even if she was fierce and demanding, 'Jani [was] very considerate about [Sumithra's] needs,' Sumithra observed. 'I wish I had some of the admirable qualities that Jani possesses—unselfishness foremost,' she would add. And on another occasion, she would remark, 'Jani cheered me. She is a treasure.'

In February 1914, Devi Amma attended the Parents' Day at the convent, with her daughters Lekshmi, Cousalya, Parvathi and the younger girls, Janaki and Devayani, and nieces Tara and Leela (Cousalya's daughters), who were beautifully turned-out. Sumithra remained at home to take care of Lekshmi's young daughters and to await the return of the boys from school. Incidentally, Shantha (Lekshmi's elder daughter) assigned nicknames for her aunts and the younger ones followed suit—Sumithra became 'Chummai,' Cousalya, 'Kuchamana' and Janaki, 'Nachi' and later 'Nachi Amma.' A grand entertainment had been organised at the convent, where the District Judge Roberts was chief guest. Janaki, dressed in a 'gala' style for the occasion, was expected to recite a few lines of English poetry and then quickly change her clothes to appear as a house maid in the school-play. Raghavan who had arrived in time from Burma to attend the function hailed it a grand success and when the family reunited at Edam late in the evening, 'Convent news figured prominently in the conversations.' In the days following, they would indulge in moonlit strolls and extended music and poetry sessions, but the dreaded final examinations were fast approaching. Unfortunately, Janaki sprained an ankle, but only after the exams were out of her way. Accidents of this nature would recur in her life. That year, all the girls cleared their examinations.

With the convent now closed for summer vacation, Janaki began indulging in what she loved most: reading. A frustrated Sumithra commented: 'Very noisy days. Boys & girls school closed so they do nothing but make mischief. Jani spends the day like a grand madam reading. Education is a bar to helping at home.' That vacation, brother Vasudevan invited Janaki to Palghat to keep him company, as his wife, presently at Edam, was intending to spend a few days at her own house, Ambalavattom. Janaki however discovered, to her utter distress, that she had no good blouses or jackets to carry with her to Palghat. She begged Sumithra to 'sell' her one of her new 'nainsook' blouses, to which the latter reluctantly yielded. Over the next couple of days, Janaki would be busy altering the blouse to her size using sister-in-law Yeshoda's tailoring machine, fixing hooks and stitching borders

for it. Sumithra was often annoyed by Janaki's 'untidiness' and at times the two quarrelled fiercely, but they were also inseparable. When Janaki returned from Palghat two weeks later, the two chatted late into the night, catching up on Palghat news. Part of the summer vacation would also be spent with forester brother Kittu in Ootacamund, whom Janaki would help in making botanical illustrations.

When the results of the school-leaving examination were announced in April 1915, there was much elation at Edam; Janaki had passed with

Figure 1.1 Sub-Judge Edavaleth Kakkat Krishnan (1841–1907) and Kuruvey Devaki Amma (1864–1940), c. 1890.

Source: Courtesy of the EK family.

flying colours. Girls and boys from Malabar usually went to Mangalore for their intermediate education. In fact, Janaki's friend and schoolmate, Amy Saldanha, daughter of C. T. Saldanha of the Indian Medical Service posted at Tellicherry, tried to persuade her to join the Government College, Mangalore, but she would choose to apply to the newly established Madras College for Women (renamed Queen Mary's College in 1918) in Mylapore for the FA course (First Examination in the Arts), perhaps on the advice of her brother Kittu, who had been appointed probationary 'EAC of Forests' (Extra Assistant Conservator of Forests). Founded as a junior college in July 1914, the Madras College for Women was controlled by the Director of Public Instruction and managed by the local government; it was the city's first women's college. Besides Kittu, Janaki's elder brothers Raghavan and Vasudevan would also agree to support her education in Madras.

Figure 1.2 John Child Hannyngton (1835–95).
Source: Courtesy of the EK family.

Figure 1.3a-b Janaki's Birth Certificate (copy issued by Tellicherry Municipality in 1935), with names of parents, date of birth and date of vaccination.

Notes

1 Forbes, *Oriental Memoirs*, Vol. 2, p. 456. Forbes travelled across India between 1765 and 1784.
2 Ibid, p. 181.
3 Innes and Evans, *Madras District Gazetteers*, Vol. 1.
4 'The Home Friend, A Weekly Miscellany of Amusement etc.' http://malabardays.blogspot.co.uk/2010/03/tellicherry-in-1850.html

5 Edgar Thurston, Superintendent of the Madras Government Museum, quoting from an article published in the *Indian Review* (October, 1906) in Thurston, *Castes and Tribes of South India*, Vol. 7, pp. 115–116.
6 Beteille, 'The Social Character of the Indian Middle Class', p. 83.
7 Mundon, 'Renaissance and Social Change in Malabar', p. 166.
8 Ibid., p. 167, f9.
9 Kurup, *Modern Kerala*, pp. 84–86.
10 Mundon, 'Renaissance and Social Change in Malabar', p. 175.
11 *Malayalabhaasha Vyakaranam* (1859); Gundert paid his researcher-munshi Kunhi Kannan Vaidyar a sum of Rs 10 per month. See Gundert, *Tagebuchaus Malabar*, pp. 62, 64.
12 Ibid., p. 75.
13 When Hermann Gundert founded a primary school in Tellicherry, among the students who opted to study there a great number belonged to the Thiya community; Gundert taught them science, geography, English, Malayalam and the Bible. See *Report of the Basel Mission*, 1840, 1841 and 1842; about the same time as the school in Tellicherry, a primary school was begun at Bernassery near Cannanore (1842) and a few years later at Kallayi near Calicut (1848). These schools played a major role in providing an education that was modern and the opportunity to mix with students from a range of social backgrounds. Several of the Basel Evangelical Mission primary schools were later upgraded as middle-schools and high-schools. Kurup, *Modern Kerala*, pp. 84–85.
14 In 1879, this institution went on to become a second-grade college (later called the Calicut Government College).
15 H. V. Conolly had been brutally murdered only a couple of years earlier, in 1855, by four Mappila convicts averse to him and his intentions.
16 Testimonial provided by Edmund Thompson, private collection.
17 Private collection.
18 The Tellicherry Municipality was constituted in 1866. The right of election of the Municipal Chairman having been withdrawn in 1898 'owing to the unsatisfactory state of municipal affairs', it then fell on the Government to nominate the right person for the post.
19 *Rao*, The *Indian Biographical Dictionary*. Unfortunately, neither of these books has been traceable.
20 Thomas Caverhill Jerdon made Tellicherry his home between 1847 and 1851. Appointed Civil Surgeon of the station, Jerdon, a keen naturalist, missed no opportunity in exploring nature around him; he is believed to have kept a pet otter at his house in Tellicherry. Jerdon studied the many species of ants in Malabar, and discovered at Tellicherry the *Harpegnathos saltator*, referred to as the Jerdon's jumping ant. A pioneering ornithologist, Jerdon described several species of Indian birds hitherto unknown to the scientific world, including many Malabar ones, and regularly corresponded with that other well-known figure of Indian ornithology and politics, Allan Octavian Hume, while stationed at Tellicherry. See Jerdon, *Birds of India*; among his other publications is the beautiful *Illustrations of Indian Ornithology* (1847).
21 Influenza-related mortality figures for London in this year were among the highest in a decade (1890–1900). *Evening Post*, 23 February 1895, p. 1.
22 Sub-Judge E. K. Krishnan's diaries, private collection. Unless otherwise stated, the chief source for this chapter are these diaries.
23 J. C. Hannyngton's career began as a writer in the service of the East India Company in 1857. In 1859, he was sent as Assistant to the Collector/Magistrate, Trichinopoly (Tiruchirappalli); he moved to Malabar in 1861, where he spent

a period of ten years. Hannyngton was appointed Acting Judge of the Court of Small Causes at Tellicherry in 1866, and later given the additional charge of Acting Collector and Magistrate of Malabar. In April 1867, he was returned to Tellicherry as Judge of the Court of Small Causes. The next year saw him act as Judge of the Civil and Sessions Court of both Tellicherry and Calicut. He would hold the position until 1871, before moving on to Salem and Guntur. On retirement from the Madras Civil Service, he moved to the Travancore service where he served four stints as Resident of Travancore and Cochin: 20 February 1878–March 1879, 1 April 1881–May 1883, 15 August 1884–July 1887 and 7 October 1888–July 1890. For a brief note on J. C. Hannyngton's career in India, see the *Asylum Press Almanac*, Madras, 1892, p. 119.

24 Thurston, *Castes and Tribes*, Vol. 7, p. 36.

25 Logan, *Malabar Manual*, Vol. 1, p. 143.

26 During this ten-year tenure, he had been signatory to the contentious Periyar Lease Deed of 1886 between the State of Travancore and the Government of India, whereby it was agreed that the Madras Presidency had the right to divert waters below the 155-foot contour over a lease period of 999 years.

27 *Madras Mail*, 18 March 1895.

28 Library and Archives at Royal Botanic Gardens, Kew (RBG Kew, Library & Archives): Director's Correspondence 157/428a, letter dated 26 June 1883.

29 Hannyngton's wife, Laura Elizabeth Onslow, would bear him five children from what we know; of these, at least two sons, John Arthur Hannyngton and Patrick Hannyngton, were born in Tellicherry, in 1868 and 1871 respectively. William Onslow was born at Salem in 1874 and Frank Hannyngton a year after. Their sister Agnes Bernice Hannyngton was born in Trivandrum in 1878.

30 *Hobson-Jobson* (1903) explains that 'rolong' was a corruption of the Portuguese 'roláo' or 'raláo' meaning semolina or *sooji*, p. 767.

31 See Moore, *Malabar Law & Custom*, p. 73, wherein he cites Justice Muttusami Aiyar's (President of the Malabar Marriage Commission of 1891) statement: 'As a religious ceremony it [tali-kettu-kalyanam] is taken to give the girl a marriageable status and in North Malabar she is addressed afterwards as Amma or lady'.

32 For a detailed description of the *tali-kettu-kalyanam* followed by the Thiyas of North Malabar in the early twentieth century, see 'Marumakkathayam Marriage Commission: Answers to Interrogatories by Onden Ramen, Sheristadar, Chirakkal Taluk' in *Report of the Malabar Marriage Commission* 1891, Appendix 3, part 6, pp. 2–5; also see C. K. Revathi Amma, *Sahasrapoornima*.

33 Thurston, *Some Marriage Customs in South India*, p. 178.

34 E. K. Janaki to E. K. Raghavan, letter dated Ootacamund, 10 May 1911, private collection.

35 See, Forbes, *Oriental Memoirs*, Vol. 2, p. 181.

36 Unless otherwise cited, the other important archival source for this chapter is E. K. Sumithra's diaries, private collection.

37 Allen Raine was the pseudonym of the Welsh novelist Anne Adalisa Beynon Puddicombe (1836–1908).

38 This song is a reference to the Siege of Lucknow (1857), which was one of a series of sieges and battles collectively called (by the British) 'the Indian Mutiny' of 1857–58. It was composed and arranged in the late nineteenth century for the pianoforte by John Blockley. For more on the ballad see Llewellyn-Jones, *The Great Uprising in India*, pp. 23–24.

39 Devi Amma's half-sister Kalyani (born to Kunhi Kurumbi and a Nair gentleman) had no children; she acted as a foster mother to Devayani (E. K. Varadan's twin), the youngest in the EK family.

2

MADRAS I

Science and Politics in a Cosmopolitan City

> I am glad to tell you that I had the luck to listen to Mr Ghandi's lecture the other day . . . So plain an Indian. One cannot but be impressed at his simplicity. His eloquence is like his external self. So simple yet so powerful in its effect. I think I could fall at his feet and worship him. Listening to his thrilling words on Social Reform I could not but be moved a little with feelings both of Patriotism and self sacrifice . . . I have a great mind to give up everything and devote to my life to the service of the mother country . . . but I am sure such a life, as a young unmarried woman will be hard as well as dangerous.
>
> —E. K. Janaki Ammal (1916)[1]

On 30 June 1915, seventeen-year-old Janaki boarded a train for Madras with five other students (and her mother as far as Tirur), to join the city's College for Women. With so much company, she found the journey 'far from wearisome.' Moreover, her brother Raghavan's friend from his school days, A. K. Govindan, had promised to receive her at Madras Central railway station. When the train pulled into the station, Janaki was met by a cheerful Govindan and his young wife, who took her to their house, fed her well and made sure she rested before enrolling for the FA course (1915–17) the following morning. The college provided accommodation for non-residential students, but as the hostel building was not yet complete, students were put up at the Capper House, a garden house on the Marina belonging to Col. Francis Capper: 'It is a fine building close to the Cathedral of St. Thomas' (the area called San Thome near the Marina in Mylapore), she wrote to brother Raghavan, after she had moved in. They were in all fourteen girls, ten of whom were Malayalis, 'mainly Nairs,' she noted. Besides her, there were three other Thiya girls: the 'two Miss Palpus' [daughters of social reformer Dr Padmanabhan Palpu or his elder brother Velayudhan Palpu] and 'N. K. Narayani, sister of the dresser employed somewhere in Burmah.'[2] The College Principal Miss Dorothy de la Hey and a teacher (probably Miss Philips) resided with the girls at Capper House.[3] Incidentally, the first 'Hindu' lady

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to be appointed at the Madras College for Women was Miss Kamakoti Natarajan; a graduate of the Bombay University, and daughter of the editor of the *Indian Social Reformer*, Kamakashi Natarajan, she taught history.

In her letter, Janaki described her room and the mess at Capper House: 'On the whole it is rather comfortable. Each room occupies two and contains two cots, two chairs, two tables and a mirror and bureau. We all eat together the food cooked and served by a Brahmin. Sitting on the floor with leaves in front of us we cut a very strange scene especially to the European ladies who have never had a chance of seeing a Malayali mess. We get nothing but vegetable together with ghee, sour milk and *rasam*.' At first, Janaki did not care much for the curries and was even homesick, but with time she settled down well to it. The mess charges came to a total of Rs 16 per month, but this did not worry her much because she was hopeful of winning a scholarship. The students were however expected to pay a security deposit of Rs 25, and it was this that was making her anxious: 'this sum will be returned . . . on leaving college. I have not yet paid the amount. I don't know what to do. The cost of books too comes up to a good amount. This month being the first will be very expensive. I have not got anything from Kittuattan [brother Kittu] or Vaston [brother Vasudevan]. I hope you have sent me something. You can more or less guess the amount of expense when joining a college. So please send me something more. From next month forward you will have to pay just a third of the messing & a small pocket money. I go to Devu's [perhaps a college-mate] house on Sundays and there at least a nice meal awaits me. Her house is quite close so that I even run up to it at times when water is scarce and I want to bathe. . . . How are you doing there? I'll be waiting for your M.O. and letter,' she wrote to Raghavan.[4]

First Examination in the Arts

At the Madras College for Women, Janaki had opted for 'Group II,' which included Natural Science (Botany and Zoology) and Physical Science (Chemistry and Physics), besides English, but because there were no professors at the College to teach the science group, students had to go to the Presidency College, also on the Marina, to attend lectures. Government 'rickshaws' (*jutkas*) transported them between the Colleges free of charge. In 1915, for her intermediate examination in botany, Janaki studied P. F. Fyson's *A Botany for India* (1912), David Thoday's *Botany for Senior Students* (1915) and K. Rangachari's *Manual of Elementary Botany for India* (1916). Raghavan had sent her a collection of Shakespeare's plays when she enrolled for the course and within months she had already read several plays from it: 'At present I am with *Hamlet*. I read each play twice. Then only am I able to digest and relish Shakespeare,' she wrote to Raghavan.[5] Janaki would miss no opportunity to quote from the bard in her letters.

In the first year of study, the Madras University English curriculum for the intermediate examinations included a detailed study of Shakespeare's *Henry V* besides Milton's *Paradise Lost* (Book II), Coleridge's 'The Ancient Mariner,' Matthew Arnold's 'Baldur Dead' and 'The Forsaken Merman' and Boswell's *Life of Johnson*, 1763 to 1767 (Blackie's English Texts). In addition, students were also expected to study as 'non-detail,' Walter Scott's *Quentin Durward* (1826), William Morris' *Sigurd the Volsung* (1876), A. J. Church's *Henry V* (English Men of Action, 1891) and W. W. Skeat's *The Past at Our Doors* or *The Old in the New Around Us* (1912).[6] Over the second year, the students would study Shakespeare's *Julius Caesar* besides poetry by Keats and Tennyson, and some more Milton and Boswell.

Edam's Saviour

Janaki was a good correspondent, writing regularly to her mother, sisters and brothers, and always in English, with occasional words in Malayalam thrown in for emphasis or effect. She would remain a responsible sibling, even trying her hand at matchmaking on behalf of her unmarried elder siblings. She was mindful of the social class she belonged to as the daughter of late Diwan Bahadur Sub-Judge E. K. Krishnan but was also deeply tormented by the social stigma her family suffered on account of the 'white stain' on the maternal side. A few months into her FA course, Janaki wrote to brother Raghavan:

> what if you marry my room-mate and class-mate Narayani, the sister of the dresser in Burmah? You saw her photo, what do you think of her? Not ugly, is she? And the most educated girl you can find. She is up to date and can move freely in any society. I think she is a fit sister-in-law. Only about her people, they are, rather, they were insignificant people. Her father was *masalchee* or some personage like that but she is of an unstained *tharavad* though it is a very low one in the sense of the world. I am sure her people will jump at the idea of her marrying an E. K . . . do you think Parvathiattathi [elder sister Parvathi] can be married to her brother?[7]

Janaki would spend her Christmas vacation of 1915 at the college. This was the first time ever she was away from home during the holidays, but had to save to make ends meet; her roommate Narayani on the other hand was lucky to go home to Tellicherry. Devi Amma would send a parcel containing pickles and bananas through Narayani; the other girls brought back sweets from their homes. In a letter, Janaki described to Raghavan the 'large ripe papayas,' she had recently relished, each 'like a pumpkin,' the seeds of which she had saved to take back home. Her passion for gardening, something she had inherited from her father, was already evident, so much so that

despite limited means and far from robust health, she had begun to garden at Capper House.

> I suppose you have a garden of your own there. I have purchased half a dozen flower pots to do some gardening during my leisure hours. I have placed them just in front of my room. I am owner of two pots of chrysanthemum (white) and two chilli plants. I have also sown two seeds of the garden palm. If you have any seeds can you send me a little of each! I think you can just drop a few of them in your letter each time you write to me. I believe it is not wrong to do so? [I want to make] a pretty garden in front of the old building. It is [very] small and crowded. At present balsams. Zinnias and Holly Hocks form the majority. Chrysanthemums and lilies are also seen flowering from time to time. It is a pity the space for gardening is so limited. I have planted vegetables like *thovara* [written in Malayalam] and chillies near our kitchen. They are growing quite well.[8]

Despite having remained at the College during vacation, Janaki and her hostel-mates would have no reason to complain: 'We had plenty of outings,' she reported to brother Raghavan, for the Irish-born Miss G. C. McCormick, one of the lecturers, had ensured their vacation would be an enjoyable one. Sometimes McCormick would go 'out for a drink or a shopping' with her. In late December, Mrs Bedford, associated with the National Indian Association, and the Ladies' Recreation Club, Madras, and a well-wisher, took the students to People's Park to see the grand Madras Exhibition (December 1915–January 1916) inaugurated by Lord Pentland (John Sinclair, Governor of Madras), a radical liberal who had supported women's suffrage as Secretary of Scotland and was a popular figure in Madras during his tenure as Governor (1912–19). He took an abiding interest in urban planning, in the development of local industries and in Hindu culture.[9] Only a year before he had facilitated mathematician Srinivasa Ramanujan's journey to England, for the latter's legendary meeting with the Cambridge mathematician G. H. Hardy. However, he would also be disliked for his attempts at crushing the Home Rule League and arresting Annie Besant and other leaders of the movement, in June 1917.

The Madras Exhibition included a medical section, curated by the Surgeon-General of the Madras Presidency, Dr W. B. Bannerman. Bannerman, incidentally, was President of the Indian Science Congress held in Madras in January that year, six months before Janaki arrived in Madras. When the Women's College group progressed to the medical exhibition venue, the Governor was present, as a result of which they 'were saved from the push and knocks of the crowd,' and moreover 'His Excellency was kind enough to ask Dr. Bannerman to explain' to them 'the various photos of diseases in India' exhibited.[10]

Keen on seeing new lands, Janaki much wished she could visit Burma, where her brother lived and worked. The eighteen-year-old wrote to Raghavan telling him how much she longed to go on a 'voyage': 'I am sure it will be very easy for me to [cross] the Bay to you . . . to spend a . . . vacation . . . but it all lies in your [enticing?] a girl to wife. I hear that Telly [Tellicherry] is teeming with [men looking for] girls. Don't you think it will be very good of you to add one to the number. All the pretty girls are being picked away one by one. You had better try your hand soon.' She also spoke of how much elder brother Padmanabhan also had 'a great fascination for Burma,' but of late had been 'getting attacks of asthma often.' Despite bad health he would 'imprudently' go to play cricket matches, she complained, and as a result 'study was out of question.'[11]

Janaki was still awaiting the books she had requested Raghavan to send her and wondered whether the delay was because they were unavailable in Rangoon. She had received her monthly remittance of Rs 5 from him in December, but needed more the following month having incurred some expenses during the vacation: 'Can you send me Rs 7 instead of Rs 5 this month Ragton [Raguattan]? I had some extra expenses in the shape of carriage hire and [Christmas] cards last month, besides our food money has come a little more owing to the lessening of numbers during the vacation.' Most of the results of the half-yearly examination were out and she had done quite well, but was dreading her Physics results. 'I don't expect good marks in it,' she would remark. Janaki was happy in Madras, finding it very pleasant at this time of the year, but found that she was turning into 'a regular negro.' 'Some say it is due to the salt air but have we no salt air in Telly?' she quizzed her brother. 'How did you spend Xmas and New year? . . . Please give me a long letter. I am anxiously waiting to hear from you. Or do you mean to give me a surprise visit. That will be much better,' she added.[12] Janaki wrote to him again in February that year: 'Do you think you can send Rs 10 next month Raguattan? I am rather hard up without coins in hand to buy even the bare necessities of life. My stationery, soap etc have not been refilled this year and I had to buy some more books this year. You can understand what all an Intermediate student will require. I have not even a pie for pocket money.'[13]

Seeing Gandhi

Incidentally, the most popular soaps in Madras at this time were imported English ones like Wright's Coal Tar ('The Soap for India, Good for prickly heat, wards off insect bites'), Pears ('Good Morning! Have you used Pears Soap?') and later Palmolive. In just a few years' time, the Calicut Kerala Soap Institute, in the heart of Calicut on the land originally owned by Rarachan Moopen of Kallingal Madom, a friend of Janaki's late father, would market its Washwell and Vegetol soaps ('genuine soaps' with no

'fillers') as *swadeshi* products, made of locally available vegetable oils under the able direction of chemist Dr Ambat Keshava Menon. Gandhi would speak on the meaning of *swadeshi* at a Missionary Conference in Madras on 14 February 1916, besides addressing the annual meeting of the Social Service League at Ranade Hall on Brodie's Road a couple of days later. He was keen that his message reach the college students of the city and for this purpose visited several institutions including the Victoria Students Hostel at Chepauk, YMCA Hall on the Esplanade and Anderson Hall (as part of the official inauguration of the Madras Christian College's Debating Society). He explained to the large gathering of students, the aims of the Satyagraha Ashram which was opposed to the accumulation of wealth and the need to take the *Swadeshi* vow. An opportunity to listen to Gandhi in Madras was unmissable. It was perhaps at the YMCA Hall that Janaki saw Gandhi for the first time ever; it made a lasting impression on her, as is clear from her letter to brother Raghavan, quoted in the epigram to this chapter, in which Janaki wrote about her wishes for the future, which included dedicating her life to social service:

> I often think over what he said that day. I have a great mind to give up everything and devote my life to the service of the mother country why not join the Servants of India Society. It is doing so much good to our land. I think it is the best way I can devote my life to a good end but I am sure such a life, as a young unmarried woman will be hard as well as dangerous. I must pass my BA and then I must think of what to do. I often wish I were old, an old maid so that I could do and go anywhere. At other times, I think of going in for medicine. That is what India needs most. I must consider before I take to some conclusion.[14]

The lesson in simplicity Janaki would instantly imbibe; in a few years, her style of dressing would undergo a radical transformation and she would begin wearing light or pale-yellow saris, like a renunciate or even a Buddhist. She would also begin experiments in vegetarianism.

Entertaining Diversions

Like her father and brothers, Janaki enjoyed playing tennis (a popular sport at these times) and being physically active in general. Janaki had become a tolerably good tennis player within months, 'improving with long strides' but was unhappy as she did not own a racquet and had to borrow one each time. Not one to lose an opportunity to quote from Shakespeare, she remarked: 'I want to play and Shakespeare says, "Neither a borrower nor a lender be" (quoting Polonius's advice to his son, Laertes in *Hamlet*, Act I, Scene III).' She chided brother Raghavan, passionate about cricket like all

true-bred Tellicherry boys, but who had now begun to find it physically challenging: 'Why do you stick to cricket when you see it does not keep well with your health? Pappuattan [brother Padmanabhan] is as crazy after it as you are. And he seems to get on alright in spite of his asthmatic body. He writes he has been scoring a good deal since late.'[15]

An interest in travel and adventure would become a major driving force behind Janaki's choices in life, including her scientific practice, but more on this later. Both her roommate Narayani and herself had brothers living in Burma and so it is hardly surprising that she kept track of the Burmese festival calendar. She wrote to brother Raghavan:

> You say the Burmese festivals will soon begin, Yes, I remember you sending us pressed flowers some time near Vishu [April]. I am sure it is that festival that is going to come off. What about the water festival, Is it over? One of our professors has been to Burmah. She speaks of the land very favourably. How I wish to see it. I think I will surprise you sometime during my stay in Madras. I have a classmate a girl named Janaki, niece of the Peria Samy Pillai . . . who has many of her people there. What do you think of the idea?[16]

Janaki was doing well at college, but was somewhat annoyed that they had classes throughout the week: 'Had it not been for the sea in front of us, I am sure our life with all its company would be a bit monotonous,' she remarked.[17] This love for the ocean, and curiosity about the world beyond, would remain undiminished throughout her life. She would not miss the opportunity to play Shylock in the *Merchant of Venice* (Second Part) in the month of February (1917) at Snowdon, Adyar, the residence of Mrs Bedford. Janaki's roommate Narayani would play Antonio. It was Miss McCormick and Miss Phillips who had trained the students in their parts. The *Indian Ladies Magazine* reported: 'It was a pretty sight to see many girl students-most of them Indians, the future hope of our India, trying to enter into the spirit of the immortal Shakespeare, and speaking his grand and gracious words with great understanding and enjoyment.'[18]

A Bachelor's in Botany

Janaki passed her FA in the summer of 1917. Moved by Gandhi's call to serve society and the frenzied social reform drive in Madras, she had toyed briefly with the idea of becoming a doctor like her late brother Damodaran; women like Ayyathan Janaki Ammal from Janaki's neighbourhood of Chetamkunnu, and V. V. Janaki of Calicut, had qualified as doctors at least a decade earlier.[19] It was also in 1917 that Sarojini Naidu and Margaret Cousins (founder of the Women's Indian Association, Madras, established to

serve as a platform for women to influence government policy) led a group of prominent Indian women across the country to demand that women's suffrage be included in the nascent Franchise Bill being developed by the Government of India.[20] Janaki abandoned the plan however in favour of botany and enrolled herself in 1917 for a BA (Hons) degree at the prestigious Presidency College on the Marina, just a short distance away from the Madras College for Women, where she resided.[21]. She was determined to become a scientist rather than study medicine, which incidentally her roommate N. K. Narayani would pursue.[22] It might be noted that Janaki's decision to become a scientist was a most unusual one for the times, when the only career options for educated women/graduates, invariably pulled into the vortex of social reform, were that of an educator, doctor or social worker, or later nurse.

There were six first-grade colleges affiliated to the University at this time: Government Presidency College, Government Muhammadan College, Madras Christian College, Pachaiyappa's College, Madras College for Women and Women's Christian College. For the three-year honours degree, one enrolled at the Presidency College, which offered courses in English Language and Literature, History and Economics, Mental and Moral Science, Sanskrit, Mathematics, Physics, Chemistry and Natural Science. The only other institution to offer these courses was the Madras Christian College, but it was located on the outskirts of the city. For a degree in Natural Science, students were examined in two Parts: Part I dealt with English language and literature, chiefly two Shakespeare plays and some prose and poetry from the sixteenth to eighteenth centuries, while Part II covered the main subject of study and a subsidiary one. Janaki chose Botany for her main and Geology as her subsidiary subject. For Botany main, students were taught the general morphology and physiology of plants and the peculiarities of form or structure depending on habit or habitat; the systematic position and relationship of the chief flowering plants and ferns of India and in general of flowerless plants, especially those of economic importance; general palaeobotany especially with reference to the relationship of modern plants; and lastly the phenomena of heredity, and selection, natural and artificial. All these aspects would come into play, especially the last, and flowering plants in particular, in Janaki's researches in the years to come. In December 1919, she bought herself Charles Darwin's *The Various Contrivances by which Orchids are Fertilised by Insects* (1877). The student was also required to submit for examination her laboratory notebooks containing drawings relating to the practical work conducted during the period of study. Janaki had enough experience in this department, having made several botanical illustrations for her forester brother Kittu.

The honours students were expected to own a copy of Eduard Strasburger's *Textbook of Botany* (1894; 1908 edition), Ludwig Jost's *Lectures on*