Innovations ‘Out of Place’: Controversies Over IVF Beginnings in India Between 1978 and 2005

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ABSTRACT

In 1978, the year the first in vitro fertilization (IVF) baby was born in the United Kingdom, a research team in Kolkata reported that it too had successfully produced an IVF baby in India. However, the claim was dismissed at the time, because the experiment was conducted outside authorized institutions and recognized centers of innovation—in short, because it was an innovation ‘out of place.’ Tracing controversies over the case between 1978 and 2005, I show the importance of space or place in processes of knowledge production and recognition. Further, I explain the initial repudiation and subsequent partial recognition of the claim through shifts in the landscape of legitimate spaces of innovation. By discussing this specific case of the production of science and technology in the Global South, I challenge conventional narratives of diffusion that are prevalent in studies on the worldwide proliferation of reproductive technologies.

KEYWORDS

India; Global South; innovation; in vitro fertilization (IVF); knowledge production; science studies

On January 16, 2014, I attended the memorial birthday celebration for Dr. Subhas Mukherjee, who would have turned 83 that year. The function took place in his former flat in an upper-class neighborhood in South Kolkata. As every year, his former colleague and friend, Professor Sunit Mukherjee, was organizing the festivities. Around 30 people were squeezed into the small living room, where swamis from the Ramakrishna Mission played devotional music. The audience faced Dr. Subhas’s black-and-white photograph, carefully placed on a table and decorated with flowers. After a while, Prof. Sunit got up and spoke to the guests through the microphone that had been installed for the occasion. To my embarrassment, he asked me to come ‘on stage’ and briefly explain my research project after introducing me to the attendees with the words: “Sandra is doing a PhD on IVF in India. That is why she has to start with Subhas. Where else could she begin? She has to start with him.”

The words “she has to start with Subhas” point to ongoing controversies surrounding the beginnings of in vitro fertilization (IVF) in India. In this article, I delineate the trajectory of a claim made by Dr. Subhas about the first successful IVF in India in 1978—the same year the first IVF baby was born in the United Kingdom—as well as the debates about the case that ensued between 1978 and 2005. I discuss why the claim was dismissed at first and recognized a few decades later, at least among medical circles in India. One reason is the importance of ‘space’ or ‘place’ in processes of knowledge production and recognition. Dr. Subhas’s experiments constituted an innovation ‘out of place,’ conducted in a space outside medical institutions and recognized centers of innovation. Relying on Mary Douglas’s (2002:36) notion of dirt as “matter out of place” and on Doreen Massey’s (2005:9) relational conceptualization of space as a “simultaneity of stories-so-far,” I explain the initial repudiation and subsequent partial recognition of the claim through shifts in the landscape of legitimate spaces of innovation—shifts to
which the pronouncement of the claim itself has contributed. I also demonstrate that excavating Dr. Subhas’s marginalized account has broader consequences: by diverging from hegemonic narratives of diffusion and diversion, it “provincializes” (Chakrabarty 2000) conventional IVF origin stories and reflects on the production of science and technology in the Global South.

**Research methods**

This article results from dissertation research on reproductive technologies in India that I conducted over 18 months in- and outside of IVF hospitals in Delhi, Kolkata, and Mumbai between 2010 and 2014. The sources for this particular article are semistructured interviews and informal conversations conducted in English between 2012 and 2014 with witnesses of the experiments and participants in the controversies in Kolkata. Among my interlocutors were scientists, clinicians, representatives of medical organizations, government officials, politicians, and journalists, as well as Dr. Subhas’s family members, friends, colleagues, students, and former patients (including the first IVF baby and her parents). Consent was granted orally and interviews were recorded on tape or in writing. Some of the direct quotations used in the following derive from notes typed out after the interview, as a result of which they are not verbatim. Persons whose names are already in the public domain and who are openly connected with this case are not anonymized. For my research, I further relied on observations at memorial events and conferences, grey literature, and newspaper articles in different English and Bengali dailies. I focus on articles published between 1978 and 1981 in *Amrita Bazar Patrika*, which used to be an Indian-owned and leading regional newspaper in West Bengal. Interweaving past and contemporary sources, I do not aim to give an account of what ‘really’ happened; rather, I examine controversies and shifting debates surrounding the beginnings of IVF in India.

**Tales of diffusion**

In order to understand the consequences of the Kolkata research team’s claim for the medical world on the one hand and academic scholarship on the other, it is important to briefly examine main-stream IVF historiography and scrutinize the often implicit assumption in studies on the worldwide proliferation of reproductive technologies, according to which technologies emerge in the ‘West’ and spread to the ‘Rest.’ The history of IVF seems solid and well documented. One of the most recent milestones of its sedimentation was the bestowal of the Nobel Prize in Physiology or Medicine 2010 to Robert G. Edwards. The Nobel Prize committee noted:

> As early as the 1950s, Edwards had the vision that IVF could be useful as a treatment for infertility. He worked systematically to realize his goal, discovered important principles for human fertilization, and succeeded in accomplishing fertilization of human egg cells in test tubes (or more precisely, cell culture dishes). His efforts were finally crowned by success on 25 July, 1978, when the world’s first “test tube baby” was born. During the following years, Edwards and his co-workers refined IVF technology and shared it with colleagues around the world. (Nobel Assembly 2010)

The quotation is illustrative of dominant IVF historiography in several respects: (1) the depiction of the process as a struggle undertaken and won by an ingenious inventor, evoking the image of a strenuous but direct road to success; (2) the emphasis on the enumeration of ‘firsts,’ implying a focus not only on the search for origins, but also on successful results; and (3) the determination of the point of origin of IVF in the United Kingdom and its later spread from there. Statements echoing the latter point also surface in accounts by medical anthropologists and scholars of science and technology studies (STS). To give but one example with regard to the global travels of reproductive technologies: “Western-based reproductive medicine, including new reproductive technologies, is spreading to the developing countries of the non-Western world. . . . They are being rapidly exported
and consumed around the world, with far-reaching implications for societies on the receiving end of global technological transfer” (Inhorn and van Balen 2002:25, italics in the original).

While STS scholars have long troubled unilinear modes of history-telling by pointing to detours and contingencies, once they shifted their quite exclusive focus from science in the Global North to its worldwide presence, “the dogma of its Western origins” (Raj 2013:342) as well as concepts of diffusion have often remained unchallenged (cf. Prasad 2008). Bruno Latour (1986), for example, demonstrated how, once facts are generated and stabilized in the center of scientific knowledge production, they can circulate quite easily in an unmodified form, a phenomenon he termed “immutable mobiles.” This is indeed plausible with regard to international standards and guidelines that seem surprisingly invariant at first sight, although many contributors to this special issue demonstrate their variability in practice. Later on, conceptualizations of ‘fluid’ spatialities (e.g., Law and Mol 2001) drew on and echoed the dictum that the global spread of science and medicine goes hand in hand with adaptations, reconfigurations, and diversions. The interplay with “local moral worlds” (Kleinman 1999; cf. Inhorn 2003b) results in “vernacularized” (Simpson 2013) variants, which resonate with more general ideas about the “indigenization of modernity” (Sahlins 1999) and the “co-production” of science and society (Jasanoff 2004). These understandings destabilized conceptualizations of science and biomedicine as universal and independent of space and time and generated “empirical stud(ies) of the translocal co-production of technosciences and social orders” (Anderson 2002:647; with regard to IVF, see, for example, Bharadwaj 2003, 2006; Inhorn 2003b; Roberts 2012).

But even though attending to creative reinterpretations conjures the agentive power of people on the receiving end of transnational travels (cf. Raina 1996:163; Raj 2013:344), it nevertheless carries the danger of neglecting to interrogate the segmentation of the world into innovators on the one hand and imitators or reinterpreters on the other. Most accounts presuppose a point of origin located in the Global North from where knowledge and technology radiate toward scientific peripheries through the centrifugal force of globalization (cf. Prasad 2008:37; see also Dhruv Raina 1996:169 for pointing out that, in this framework, reverse flows only consist of raw material or data). While the ‘West’ innovates and provides the blueprint, the ‘Rest’ imitates and, by default, deviates from set standards. At best, narratives of diffusion and diversion produce the Global South as an ingenious alternative to a guiding scheme epitomized by normal science in the Global North. But they might also lead to “a cartographic exercise that designates incompliance and ‘maverick’ practice as localisable to the wayward developing world and good science to a predominantly Euro-American haven” (Bharadwaj 2014:85).

Departing from the predominant foci on transfer, diffusion, and diversion, or even a “transformativ[e] conception of circulation” (Raj 2013:343, italics in the original), in the following account I spotlight the production of science and technology in the Global South. In doing so, I draw inspiration from Jean and John Comaroff’s (2012b) appeal for “theory from the South” (cf. Sheoran, Deomampo and van Hollen 2015) and follow studies that trace instances of innovation in the Global South: for example, Maurice Cassier and Marilena Correa’s work, which points to “some degree of continuity between pharmaceutical copying and innovation” (2007:87) in Brazil; or Laurent Pordié and Jean-Paul Gaudillière’s research, which describes an ‘alternative’ innovation regime emerging from industrialization processes of Ayurveda in India and challenges “literature on … innovation in the South (that) is still mostly concerned by technological dependence and technology transfers from laboratories in the North” (2014:61).

In this article, I examine the case of a claim of innovation in Kolkata in 1978 that was dismissed at first and recognized later on, at least within the medical community in India. Hence, I present a case study of simultaneity, or even anteriority of biomedical knowledge production in the Global South, while also rendering visible the dynamics of exclusion that prevented the claim from being acknowledged. Further, I address the rearrangement of power relations and global asymmetries that eventually led to its partial or informal recognition.

The shift from dismissal to recognition implies that the dividing line between deviation and innovation is quite thin. In this article, I demonstrate that the recognition of a claim of innovation
depends on various factors, a crucial one being spatiality (cf. Livingstone 2003; Anderson and Adams 2008:184). Space is instrumental in (de)legitimizing scientific claims, and innovations ‘out of place’ might easily turn into deviations. Further, I argue that troubling the assumption that knowledge production only occurs in circumscribed places (mainly the laboratories of the Global North; cf. Raj 2010:514) and taking into account the multiplication of possible spaces of innovation also entails a rethinking of the notion of space. Narratives of diffusion, for instance, rely on and promote a modernist understanding of space (apart from what Dipesh Chakrabarty (2000:8) has called a “‘first in Europe and then elsewhere’ structure of time”). But the “cosmology of ‘only one narrative’ obliterates the multiplicities, the contemporaneous heterogeneities of space. It reduces simultaneous coexistence to place in the historical queue” (Massey 2005:5). Massey instead understands space as multiple, relational, and emergent. Her suggestion to “imagine space as a simultaneity of stories-so-far” (2005:9), thereby emphasizing multiplicity as well as “the process of change in a phenomenon” (2005:12), makes it possible to analyze the negotiations over India’s first IVF baby within a shifting landscape of authorized spaces of innovation.

Contested conceptions

It is 1978, the year Louise Brown, the world’s first IVF baby, came into the world in the United Kingdom. Only a few months later, on October 4, 1978, newspaper reports announced that a “test tube baby” had been born the previous day in Kolkata, the capital of the East Indian state of West Bengal. The news was proclaimed by the gynecologist Dr. Saroj Kanti Bhattacharya, associate professor of Gynecology and Obstetrics at Calcutta Medical College, who delivered the baby by C-section; Sunit Mukherjee (Prof. Sunit) from Jadavpur University, who cryopreserved the embryos; and Dr. Subhas Mukherjee (Dr. Subhas), professor of Physiology at Bankura Sammilani Medical College, the head of the operation. Dr. Subhas (1931–1981) graduated in medicine at the National Medical College and completed his DPhil at Presidency College, Kolkata. A Colombo Plan scholarship facilitated his studies at the University of Edinburgh, where he received a PhD in reproductive endocrinology under Prof. John A. Lorraine (Mukherjee and Lodh 2001; Chowdhury 2006). After his return to West Bengal, he worked as a professor and researcher at government institutions and ran a gynecological practice.

The pronouncement of the three researchers in 1978 was not only an assertion that they had produced the first IVF baby in India and the second worldwide. It also constituted a claim to three ‘firsts,’ since the team’s approach differed substantially from the one in the United Kingdom. These involved (1) ovarian stimulation with the hormone hMG (human menopausal gonadotropin), instead of conducting the procedure during an unstimulated cycle; (2) the extraction of egg cells by posterior colpotomy, instead of laparoscopic removal; and (3) cryopreservation of embryos and embryo transfer in another reproductive cycle, instead of conducting embryo transfer during the same cycle.

At first, the news was received with great interest in India: the researchers were interviewed, the condition of the baby and the mother was followed, and medical officials expressed careful enthusiasm about a possible instance of innovation. Dr. Mani Chhetri, the Director of Health Services (DHS), was cited in Amrita Bazar Patrika (ABP) as finding the claim “quite convincing. If the team could now prove it, West Bengal would get a place of pride in the medical world” (ABP 1978b:1). On October 7, 1978 the three researchers were asked to submit a report to the state government of West Bengal, which established an expert commission to evaluate the case. Two months later, the inquiry committee, staffed with eminent professors but without any experts in the field of reproductive biology or gynecology, dismissed the report as “incredible” and the experiments as “unfeasible”:

The expert committee which submitted its four page report to State Health Minister, Mr. Nani Bhattacharjee on Saturday last, held the fact that a live human baby was born was not disputed. However, it appeared that most of the steps in the techniques adopted by the claimants for the successful transfer of “invitro fertilised frozen
thawed human embryo” resulting in the birth of a normal baby were not substantiated and with the alleged resources, the experiments referred to “seemed unfeasible.” (ABP 1978h:5)

In 1978, the team published a short article in the *Indian Journal of Cryogenics* (Mukherjee, Mukherjee, and Bhattacharya 1978), and Dr. Subhas was able to present their findings at a few conferences in India although he was prevented from traveling abroad. “The DHS, in a letter dated 18 December 1978, specifically prescribed (sic) Mukerji (sic) from attending ‘any conferences in the future without prior permission from the competent authority’” (Kumar 1997:530) and refused to grant him permission to participate in a meeting at Kyoto University to which he had been invited. He was also transferred to institutions, such as the Regional Institute of Ophthalmology, that did not provide any opportunity to pursue his research interests or replicate his results (Kumar 2004:254). Anger and pain were still apparent when Prof. Sunit, during one of our meetings in Kolkata, depicted his fellow collaborator’s and friend’s reaction: “Subhas said after they rejected it: ‘It is fine, don’t believe me, I will do it again. That is how science works.’ But the manner in which he was humiliated by the government, the transfer that did not allow him to carry out this work anymore.”

He was also transferred to institutions, such as the Regional Institute of Ophthalmology, that did not provide any opportunity to pursue his research interests or replicate his results (Kumar 2004:254). Anger and pain were still apparent when Prof. Sunit, during one of our meetings in Kolkata, depicted his fellow collaborator’s and friend’s reaction: “Subhas said after they rejected it: ‘It is fine, don’t believe me, I will do it again. That is how science works.’ But the manner in which he was humiliated by the government, the transfer that did not allow him to carry out this work anymore.” According to my interlocutors, a heart attack in 1980 on top of “the humiliation he was subjected to by his colleagues in Calcutta” (Kumar 1997:530) led Dr. Subhas to commit suicide in his apartment on June 19, 1981.

**Somatic evidence**

Before continuing the story, I want to pause to elaborate on the major criticisms that were raised against the team, as well as to reflect on the production of evidence in the field of IVF more generally. To this day, Prof. Sunit wonders what it would have taken to have had their claim of innovation validated:

> He (Subhas) had recorded (the procedure), records were there, but there is no proof (that a baby is conceived with the help of IVF rather than naturally). Even today, there is no proof. . . . In this last conference, this doctor (a prominent IVF clinician in Kolkata) said, “I have made two or three thousand test tube babies. And I brought some of them.” So some children came on stage and performed something. But how can he prove it that these are really test tube babies? . . . I asked him, and he said, “I kept a record.” But nobody has seen it besides his team. So how is that different from Subhas?

In order to prove the operation of IVF, a baby is not sufficient. Researchers must not only demonstrate that they have been able to emulate the principles of a natural conception but also make evident that they successfully bypassed ‘nature,’ meaning that the baby has *not* been conceived through natural conception but through medical intervention. Dr. Subhas faced three challenges in this regard: he could not present the baby, a picture of the embryo, or evidence of the blocked tubes of the mother.

Mr. Agarwal, the father of the baby, remembered that he and his wife had agreed to “try a new method” when Dr. Subhas asked them, and they were informed about “a chance of deformation of the baby.” However, they were not exactly sure what the procedure entailed and did not imagine that it would create such a stir afterward. While one newspaper published a photo of the baby right after delivery, the parents refrained from public attention later on and were anxious to keep their daughter out of the limelight: they did not agree to give interviews to the press or to testify before the government committee. “It was their duty and responsibility to have a child,” Kanupriya, the now grown-up baby, explained to me, “but they did not see the need to talk about it. My parents focused on having a child, but they wanted to be left in peace afterwards. They were unambitious and they were also scared for me.” They were scared that their daughter would be regarded as abnormal, as they told me, and they therefore even changed her name from Durga to Kanupriya before admitting her to school. This is hardly surprising, considering that in India even today IVF often carries connotations of adultery, abnormality, and aberrancy. It was not until 2001 that a prominent doctor who wanted to prove the team’s claim (see next section) managed to persuade them to sign an affidavit, which also states their reasons for reticence:
Hailing from a conservative (Marwari) family, we were worried of the possible repercussions to our reputation in case the child grew up to be abnormal. Our elders would not have forgiven us for having taken this step and society itself which did not know about these kinds of treatment, which are quite common today, would have scorned at our action.

In addition to the baby, Dr. Subhas was unable to present any pictures of the embryo that later turned into Kanupriya. During a scientific meeting on November 18, 1978, organized by the Indian Medical Organisation (IMA) and the Bengal Obstetrics and Gynaecological Society (BOGS) at Chittaranjan Cancer Institute to evaluate the team’s claim, Dr. Subhas showed pictures of in-vitro embryos with which he had been working earlier. “When he showed slides in the meeting, people laughed,” Prof. Sunit remembered:

Someone asked: “Is that Durga’s picture?” And he replied: “No, this was taken on another occasion.” He knew that when I handle an embryo I should be careful with unnecessary light and handling. But people laughed. Anyways, there is no proof; he could have taken the picture from a book. A sure proof would only be a genetic marker.

But even a genetic test would not have unambiguously established that the baby had been conceived through the method the team described. One doctor interviewed by ABP (1978a:5) at the time got to the heart of the matter:

Even taking it for granted that the birth of the baby was effected through test-tube, there were many snags in proving it scientifically. Firstly, it was difficult to prove that the mother’s fallopian tubes were blocked even before the birth of the baby. Secondly, where was the guarantee that the mother did not conceive in the natural process during the 51-day period when the fertilised ovum was kept in the refrigerator before being pushed back into the mother’s uterus.

In this sense, the conceiving and pregnant body cannot be completely trusted as a “reliable witness” (Stengers 2003:16) in IVF, as the result could have been achieved by ‘treacherous’ means, that is, natural conception. In contrast to clinical realms, where natural conception is a desirable side effect, in experimental terms it constitutes a disturbing factor that has to be controlled. For this reason, later research projects in IVF mostly enrolled women with blocked tubes as experimental subjects, since their bodies could provide conclusive proof that the medical procedure had worked, and not that ‘nature’ had taken its course. The critics therefore demanded a repeated medical examination of the fallopian tubes of the mother. But the Agarwals were not prepared to partake in further examinations without any clinical benefits, as they told an ABP reporter at the time (1978e:7):

“We will neither appear before the enquiry committee set up by the State Government nor will I allow my wife to be the guinea pig of the scientific community,” Mr. Prabhat Kumar Agarwal, father of the baby, said in Calcutta on Sunday. “I got what I wanted. Neither myself nor my wife will take any further trouble by undergoing a troublesome medical check-up,” he added.

While the Agarwals contented themselves with the cure (conception), the government committee demanded proof about the intricate details of the workings of the procedure, in particular with regard to the team’s assertion that it had produced several ‘firsts.’ The documents provided by the three researchers were not recognized as appropriate evidence for their claim of innovation—at least not in 1978.

**Stabilizing IVF histories**

Let me return to the course of events in Kolkata over the next decades. In 2002, the Indian Council of Medical Research published the National Guidelines for Accreditation, Supervision and Regulation of ART Clinics in India (a revised version was published in 2005). The Guidelines included a section on the history of IVF in India that explicitly acknowledged the claim the researchers had put forth in 1978.
The world’s first IVF baby, Louise Brown, was born on July 25, 1978, in the UK through the efforts of Dr. Robert G Edwards and Dr. Patrick Steptoe. The world’s second and India’s first IVF baby, Kanupriya, alias Durga, was born 67 days later on October 3, 1978, through the efforts of Dr. Subhas Mukherjee and his two colleagues in Kolkata. … The techniques used by Mukherjee were markedly different from those used by Edwards and Steptoe. (Government of India 2005:4)

The document, which then enumerates the team’s ‘firsts,’ constitutes the only indirect recognition of Dr. Subhas’s claim by the Indian central government so far. But why did this change of direction happen more than two decades later? And what kind of evidence corroborated the retrofitting of India’s IVF history? An attempt to answer these questions requires the introduction of two central actors: the Dr. Subhas Mukherjee Memorial Reproductive Biology Research Centre (SMMRBRC) and (the late) Dr. Anand Kumar. Their interplay turned the claim advanced in 1978 into a widely accepted and eventually officially recognized fact, at least in India.

The SMMRBRC was established in 1985 to preserve the memory of Dr. Subhas by carrying out scientific research and convening memorial orations. Prof. Sunit, who was not only a collaborator but also a close personal friend of Dr. Subhas, is the driving force behind the foundation. He has published the scientific oeuvre of his friend (Mukherjee and Lodh 2001) and organizes events that provide the opportunity to convince attendees of Dr. Subhas’s work. But all these attempts had remained relatively fruitless until Dr. Kumar got involved. “All turned around after Dr. Anand Kumar. … Without him, Subhas is no one, he has no existence,” Prof. Sunit did not tire of repeating during our conversations.

Dr. Kumar was the former director of the Institute of Research in Reproduction in Mumbai and one of the leading figures on the research project that brought India’s ‘first scientifically documented test tube baby’ into the world in 1986 (cf. Bharadwaj 2002).5 He received several of Prof. Sunit’s invitations to memorial lectures over the years, but kept declining them, since—as he told Prof. Sunit later—his colleagues had warned him about associating himself with this group of “frauds” in Kolkata. When Prof. Sunit finally met him, he convinced him to examine the papers collected by the SMMRBRC. In the end, Dr. Kumar judged them to be credible. “On going through this material I have no doubt that Mokerji (sic) did produce a test tube baby,” he wrote in one of his publications (Kumar 1997:526).6

Besides publicizing his assessment in various ways, Dr. Kumar managed to have Dr. Subhas’s claim acknowledged by the central government through the ‘back door,’ according to my interlocutors. As a member of the Drafting Committee for the National Guidelines, he apparently initiated the inclusion of the history section that mentions Dr. Subhas. Since the document was published online as a government paper, the claim was widely distributed, and the document constituted indirect recognition by the Indian government (Gosh 2005). Other steps followed suit, as a result of which the claim has turned into an established fact in today’s medical community in India. There are conferences and symposia organized in honor of Dr. Subhas, hospital wards and research centers are named after him, doctors proudly cite their earlier association with him (e.g., Chatterjee 2011), and his name was included in a medical dictionary (Chowdhury 2006).

However, what is striking is that the somatic or biomedical evidence has remained constant throughout this tumultuous history. It was not new insights but the report submitted by the team to the government of West Bengal in 1978 that convinced Dr. Kumar, according to Prof. Sunit. Therefore, the question arises: Why was the claim dismissed in 1978 and recognized in 2002, based on the same piece of paper? Instances in which artifacts shift from fraudulent to conclusive are numerous in the history of science—a phenomenon often explained by the phrase ‘the time wasn’t ripe.’ And indeed, this is an argument invoked by Dr. Kumar in one of his publications concerning Dr. Subhas (1997:529): the Indo-Pakistani War of 1971 and the concomitant stream of refugees from Bangladesh to West Bengal, the economic crisis of the 1970s, and, most important, the national state of emergency between 1975 and 1977, with its focus on family planning and forced sterilizations, all resulted in a situation in which research on fertility was not met with sympathy, let alone supported by public funding. Moreover, it is probably safe to assume that an individually
conducted research project on a medically ‘elite,’ ethically dicey, and politically delicate topic was of no particular interest to the newly established Left Front government in West Bengal, which came to power in 1977 and was occupied with land-redistribution programs and the organization of decentralized governance structures.

But the team’s endeavors in the late 1970s were also innovations ‘out of place,’ as I outline in the next section. Keeping in mind the conceptualization of space as a simultaneity of stories-so-far, it is important to note that “location matters” (Abraham 2006:217), and that the audibility of stories depends on the position from which they are uttered. In the following, I draw inspiration from Douglas’s (2002:36) notion of dirt as “matter out of place” and rely on Tim Cresswell’s (2015:190) observation that “deviation from the expected relationship between place and practice leads to labels of abnormality and inappropriateness.” The fact that the test tube baby project occurred in a space that was considered ‘out of place’ in several regards—outside of demarcated scientific realms, outside of state institutions, outside of the medical community, and outside of recognized centers of innovation—contributed to the dismissal of the claim.

Off the beaten track

Outside of the laboratory

When looking through the ABP newspaper reports of the time, it is striking that the procedure was unanimously termed an “experiment,” thereby locating it in the realm of the laboratory (and research) rather than the clinic (and treatment). And in contrast to the pragmatic workings of most clinical fertility work, the field of reproductive biology demands “very specific modalities of performing, witnessing and validating” (Bharadwaj 2014:88), including evidence that is produced and articulated within defined parameters. These modalities also entail authorized spaces where experiments can legitimately be carried out, as is illustrated by the search for the laboratory where the team in Kolkata had undertaken its research.

In 1978, the researchers were criticized for not divulging the location of their laboratory: “The committee has mentioned in its report, according to the sources, that the scientist trio have declined to disclose the location of their laboratory where they have performed the highly sophisticated job” (ABP 1978g:7). In fact, the researchers had stated that the experiments were carried out in Dr. Subhas’s flat in one of Kolkata’s upper-class neighborhoods. But the thought that someone could conduct such a high-tech procedure in the sphere of everyday life seemed fantastic. Even with respect to reproduction and conception—phenomena that are often associated with domestic spaces—the home appeared utterly inadequate in contrast to the bounded space of the laboratory.

Doctors opposed to Dr. Subhas’s claim were skeptical because of the permeability and supposed impurity of the space, as Prof. Sunit remembered:

The doctors said: “You did it in your home, but there must have been contamination.” Subhas said that it was better in the house. Hospitals are really dirty. And the main criterion is your own brain. Experts can do things anywhere without any sophisticated instruments. People have worked under these circumstances. Look at Pasteur: what were his facilities?

For Dr. Subhas’s opponents, the uncontrolled space of his home stood in stark contrast to the sanitized and secluded space of the laboratory. The idea of the laboratory as a “placeless” (Kohler 2002; Livingstone 2003) space is powerful and bestows an illusion of control and therefore credibility regarding events that happen within its borders.

The laboratory space also gains legitimacy through its social demarcation, that is, regulation of access (cf. Shapin 1988) in terms of cultural capital, such as educational achievements or field-specific degrees. Dr. Subhas, however, chose close associates as collaborators whom he trusted and who were able to help with very specific tasks. According to an interview with ABP (1978c:7), one doctor criticized this unorthodox disregard of scientific norms by somewhat slyly characterizing the
process of cryopreservation as a “miracle” and expressing doubts about the involvement of Prof. Sunit (who was neither a medical doctor nor a reproductive biologist).

Outside of institutional structures

The space of the home placed the project not only outside the laboratory but also outside institutional structures. According to the Agarwals, Dr. Subhas asked them to come to his apartment for consultations, where he was running a small clinic, after they had first visited him at his workplace in a medical college. Dr. Subhas was aware that he had to shield his experiments from governmental control and so retreated to the home as a non-institutional space. He also demanded absolute discretion from his collaborators. Prof. Sunit recalled: “Subhas knew that he would have a lot of problems. He used to tell me: ‘Be careful, we are holding the tail of the tiger.’” They realized that their experiments would cause a stir and might be regarded as unethical. “What if it is an abnormal child?” was a pressing question that dominated their research process, a valid one considering that IVF and cryopreservation had not yet been carried out with humans anywhere in the world. Even though the team and the parents were willing to take the risk—as Mr. Agarwal put it pointedly, “a deformed child is better than no child”—they found it advisable to retreat to the privacy of the home until they themselves could be sure about the outcome. Whereas this invisibility to state institutions made it possible to carry out the project, it later presented a challenge for the recognition of the claim.

While private research centers did exist in Kolkata in the 1970s, most knowledge production was legitimized by its generation within the bounds of public institutions. That is not to say that crossovers and joint projects did not occur. Scientists found their way around these boundaries through informal cooperation, thereby blurring the distinction between public and private realms. A scientist and friend of Dr. Subhas, for instance, told me about her work on developmental embryology in a public research institution, where she worked with fetuses that were illegally aborted in private hospitals. Dr. Subhas apparently received ovaries, gas, liquid nitrogen, and so forth either through his own work at public institutions or from friends employed there. Further, Prof. Sunit told me how the cryopreserved embryos were stored in a public facility: “The freezing was also done here in the apartment. . . . Afterwards we stored the embryos in liquid nitrogen elsewhere because it (the tank) had to be refilled. He (Subhas) had friends in labs where that was possible. Afterwards the embryos were brought back for transfer.”

In other words, crossovers between public and private institutions were quite common, and government facilities were instrumental for the team’s ability to carry out its project at home; the point of contention, however, was that the team operated in and announced its success from a private space without first informing the respective public institutions where they were employed. As reported by ABP (1978f:8),

Dr. Chhetri (the DHS) said that of the three scientists two were Government officers and “I think they should have at least taken the permission of the Government before seeking publicity. It may be they have acted in over enthusiasm.”

Outside of scientific conventions

The public proclamation of success through a media announcement (according to Prof. Sunit, by the gynecologist without Dr. Subhas’s consent), right after the birth of the baby, sidestepped more time-consuming procedures of bestowing credibility by the scientific community, such as publication and peer review. Since the team operated outside of scientific conventions and bypassed “gatekeepers of science” (Prasad 2007:548), researchers, clinicians, and the state government could easily dismiss their claim.

Moreover, my interlocutors reported that Dr. Subhas was disliked by senior colleagues in Kolkata, as he did not feel obliged to respect principles of seniority that are of great importance in India’s
highly hierarchical medical communities. For example, he used to openly criticize a senior and powerful gynecologist for conducting too many cesarean sections: this gynecologist turned out to be one of Dr. Subhas’s fiercest critics and became the chair of the scientific meeting organized by IMA and BOGS. Various attendees of the event reported that this meeting ended in chaos, since it was severely disrupted by senior doctors who would not allow Dr. Subhas and Prof. Sunit to present their case (cf. ABP 1978e:7). “I went to the meeting, just out of interest because I knew him (Dr. Subhas),” a scientist and colleague of Dr. Subhas detailed, “and around 200 to 300 people attended. Usually a paper is presented, and then there is a discussion later, but the gynecologists went there purposefully to interrupt him. They had clippings from books and shouted that he could not have done it. Finally the meeting was cancelled.”

According to Prof. Sunit, rather than being excited about an innovation, most senior gynecologists feared losing large parts of their patient load to someone who was supposedly able to perform ‘miracles.’ “He was a pioneer, and people did not like pioneers,” he explained. And junior doctors “did not say anything because they were afraid that their careers would suffer,” he explained.” Many of my interlocutors described the interventions by Dr. Subhas’s colleagues at the meeting as the “crab syndrome” and as characteristic of the scientific landscape in India or West Bengal (cf. Prasad 2005:469). They further speculated that the senior gynecologists were so influential that they were able to reverse the initial optimistic sentiments expressed by the DHS and other government officials. A contemporary politician in West Bengal who came to be entrusted with this case later on confirmed this view: “The government was under pressure by the lobby formed by his senior colleagues and (so they) transferred him where research could not be successfully pursued. . . . The doctors’ community did not support him, so the government went the easy way.” This was only successful, however, because medicine and science were highly politicized spheres in which politicians and bureaucrats interfered regularly—in Dr. Subhas’s case, for instance, not only by transferring him, but also by evaluating his scientific claim and preventing him from publicizing it internationally. According to Prof. Sunit, Dr. Subhas’s commitment to the ideal of science free from politics barred him from accepting help from politically well-connected patients and friends—a stance that made it quite unlikely that his challenge to the medical establishment would be officially sanctioned.

Outside of centers of innovation

Finally, the project was ‘out of place’ in yet another way. The claim about the successful performance of IVF in Kolkata in 1978 implied that it had not been an imitation of the technique used in the United Kingdom but an innovation in its own right. Moreover the team declared that it had used different methods, thereby laying claim to several ‘firsts.’ But much like the home, the Global South could hardly be imagined as a place of innovation, not only in Europe, but also in India (cf. Prasad 2014:1).

While ABP reporters (1978a:5) noted that the incident was mentioned in British news, they also observed the “underlying tone of skepticism in the reports which will not be dispelled until the Calcutta doctors are willing to furnish further medical evidence of their achievement.” Even in Kolkata, Prof. Sunit recalled, “People did not believe it could be done in India: such a sophisticated procedure which needs a lot of material.” A former president of BOGS made the dimension of disbelief clear when I interviewed him in his clinic: “In those days, it was like a miracle. Without any kind of set up, only primitive equipment. This is like I would build a Mars rocket in this chamber and travel with it to Mars and back.”

Critics were particularly suspicious about cryopreservation, as Dr. Chakraborty, a senior colleague of Dr. Subhas who was instrumental in furthering IVF research in Kolkata in the 1980s, told me: “It was not acceptable at that time. Especially cryopreservation had not been done in humans. It was not known. And then people thought one needed electricity for that, and Calcutta was known for its power cuts.” Complaints about the lack of equipment or “constraints of location” (Prasad 2014:86) were omnipresent, and infrastructural challenges were certainly more pronounced before the profound neoliberal reforms in 1991. Many doctors told me that they had to smuggle much of the
equipment required for IVF to India when they went on conference trips abroad, before the first medical distributors began operating in the mid-1990s. Prof. Sunit reported that Dr. Subhas spent a lot of his salary on maintaining his laboratory, that some of his well-off patients supported him in procuring materials unavailable in India, and that he received medication samples from the director of a European pharmaceutical company that produced hormonal products in Kolkata in exchange for advisory services.

But even if materials could somehow be made available, many clinicians pointed out that IVF procedures were not highly sophisticated or rigorously standardized. Dr. Chakraborty, for instance, described practices in Kolkata during the 1970s and 1980s as “uncivilized.” He provided the example of monitoring the surge of LH (luteinizing hormone) before ovulation by a— in his opinion very crude—procedure that often resulted in lost egg cells: “Every two hours, urine had to be taken at night. We did this like tribal people, but now everything is civilized.” These widespread discourses of scientific underdevelopment made the production of a ‘high-tech baby’ in Kolkata in 1978 improbable (see Traweek 1992, for an account of ’colonialist discourse’ among scientists).

Dr. Subhas, however, defended himself by emphasizing that it was not the equipment that was central, but the skills and experience he had acquired through earlier experimental work in this field. Prof. Sunit also remembered that:

Subhas always said that IVF requires high skill, not so much the instruments. Freezing is not complicated, (freezing) cow semen, you can do it in a cattle shed. What is complicated is the synchronization with the uterus (to estimate an opportune time for embryo transfer). . . . The DHS also asked us: “How do you know when to transfer, there are so many hormones?” But Subhas just used to see the cervical fluid and its viscosity: “If it is sticky like a gum, it (the embryo) will stick.” There were three transferred, and one stuck.

Another example Prof. Sunit described is the incubator in which Dr. Subhas stored egg cells and early stage embryos. In contrast to contemporary incubators, the researchers could only control the temperature but not the mixture of gases inside the device. Apparently, Dr. Subhas therefore used to take out the vessels containing the embryos once in a while and blow on them to provide the necessary carbon dioxide. A commentator in ABP emphasized these unfavorable conditions and observed that it is exactly instances of lack that encourage an attitude of inventiveness:

That despite the absence of delicate and sophisticated equipment the team had the daring to conceive and carry out such an experiment is indeed admirable and offers an eloquent commentary on the capability and resourcefulness of India’s medical men and scientists. In fact, the lack of experimental facilities was a test for the ingenuity of the doctors who were ultimately obliged to adopt methods distinctly different from those followed in Britain. . . . Since all the details of the long process through which Calcutta’s test tube baby was born is yet to be made public, it is too early to visualize the possible impact which the achievement will make on the various branches of science. (ABP 1978d:6; cf. Abraham 2000:173)

As demonstrated, the impact remained minimal even though successors to Dr. Subhas were inspired to continue his work in order to “prove that it is not impossible in our country,” as Dr. Chakraborty remarked. But in 1978, India remained confined to a space of imitation in the biomedical landscape, a space that innovations diffuse to rather than emerge from.

**Shifting topologies**

Place matters when innovations have to stand the test of credibility. The Kolkata team’s claim of innovation was dismissed in 1978 because the researchers were not able to make themselves heard due to their ‘offside’ position. They conducted and revealed their experiments outside of authorized spaces—the closed-off laboratory, the public institution, the rule-obeying scientific community, and the well-resourced research environment. Within the topology of scientific and biomedical power, Dr. Subhas’s home in Kolkata was too far off the beaten track and could therefore not lend credence to a claim of innovation.
But although imagined geographies of innovation proved to be consequential, space is also “mobile and mutable” (Livingstone 2003:8): more than two decades later, the conversion of the team’s report from an insufficient document to a sign of proof became possible through the advocacy work of the SMMRBRC and Dr. Kumar. Moreover, a generational change in the medical and political fields in Kolkata, a general shift away from the exclusive focus on population control in family-planning programs, the flourishing of the IVF industry in India after the neoliberal economic reforms in 1991, and the acknowledgment of IVF as a normalized and standardized medical procedure that had long lost its connotation of being something out of the ordinary all contributed to the reevaluation of the claim in the late 1990s and early 2000s.

Furthermore, it was reassessed in a different spatial constellation. In addition to a greater acknowledgment of India’s scientific, political, and economic standing by the Global North, the country’s self-conception as a scientific superpower—take, for example, the proliferation of biotechnological research and pharmaceutical production (Pordié 2014:2; cf. Sunder Rajan 2006) or the nuclear and space programs—contributed to a reconfiguration of the landscape of legitimate spaces of innovation. India could now be imagined as a place in which novelties originate. This was certainly facilitated by the central government’s increasing interest in fostering scientific innovation, coupled with the promotion and valuation of ‘indigenous’ technology by both the Congress-led UPA and the BJP-led NDA during the 1990s and 2000s (e.g., Government of India 2003; cf. Abraham 2000:167). Policies and guidelines eventually cumulated in the declaration of 2010–2020 as the “Decade of Innovations” by then-Prime Minister Manmohan Singh at the Inauguration of the 97th Indian Science Congress (Government of India 2010). Dr. Subhas’s story—as an epitome of ‘indigenous’ ingenuity—fits this agenda nicely and can now be called on to promote India as a pioneer in IVF, as a locus of medical expertise, and as a rightful international destination for reproductive care (e.g., Tikku 2013).

Like India, domestic and noninstitutional spaces were also reclassified as potentially innovative places. Take, for example, the mythos of ‘garage inventions’ so popular in entrepreneurial North America, which now translated more easily to India and its growing knowledge economy (e.g., the IT sector); or later, the rise of citizen science and DIY laboratories that purposefully circumvent institutional structures, which resonates with the widespread praise of jugāṛ in India, a concept of bricolage that productively combines lack and inventiveness. These changes became palpable in stories of second-generation researchers in Kolkata who started IVF in the 1980s and who told me proudly that they began their IVF career in unpropitious spaces, such as homes, garages, and storerooms. In retrospect, they were able to redefine their trajectory as a struggle in which, against all odds, they had been successful by improvising “with locally available materials,” according to one doctor.

Hence, altering topologies of scientific and biomedical power—from central institutions in the Global North to decentralized spots in different parts of the world—are one of the reasons that made the retrospective recognition of the team’s claim plausible: simultaneity was now more readily conceivable, at least for my interlocutors in India. That is not to say that the claim of the Kolkata researchers has been unanimously recognized nor that power differentials have completely dissolved and accusations of deviation or fraud no longer occur (see Aditya Bharadwaj 2014, for a vivid example). Although Dr. Subhas’s work is widely acknowledged in medical circles in India, it remains largely unnoticed at the global level. And Prof. Sunit continues to fight for definite recognition of Dr. Subhas’s achievements by both the state and the central government. From the disappearance of the history section in the ART (Regulation) Bill 2010, one can assume that the central government is unwilling to take the risk of formally sanctioning the claim and, consequently, disrupting global IVF historiography, which credits the first cryopreservation and the first ovarian stimulation with hMG to Australia and the United States, respectively. However, even though established centers of innovation do remain influential in many respects, global asymmetries nevertheless prove to be dynamic (cf. Pordié 2015; Raina 2003), and the spaces in which claims of innovation can be reasonably put forth have grown larger.
By the same token, the controversies over the team’s claim have contributed to reshaping the landscape of authorized spaces of innovation. If space is conceived of as a simultaneity of stories—so far that is “always under construction . . . never finished; never closed” (Massey 2005:9), then it becomes obvious why these narratives matter. And why, more than 30 years after Dr. Subhas’s death, Prof. Sunit continues to devote his life to fighting for recognition. Not only do spatial constellations influence the negotiation of evidence, but stories themselves can stretch the contours of legitimate spaces of innovation.

Conclusion

In this article, I divert from narratives of diffusion and diversion and use the emergence of IVF in India to engage with the production of science and technology in the Global South. By tracking controversies over the simultaneous occurrence of IVF in Kolkata and the United Kingdom, and the reinterpretation and sedimentation of this origin story over the course of several decades, I probe the presumed geographical hierarchy between innovative centers and imitating peripheries. I argue that “technoscientific Othering” (McNeil 2005:109) prevents claims of innovation from being acknowledged when they are voiced from spaces ‘out of place,’ as was the case in Kolkata. In other words, the diversion from authorized scientific spaces may contribute to the denouncement of claims of innovation that are negotiated not only biomedically, politically, and socially, but also geographically (cf. Livingstone 2003). Hence, space matters, not only with regard to the circulation but also in terms of the production and recognition of science.

Relying on Mary Douglas’s notion of dirt as “matter out of place” and Doreen Massey’s relational conceptualization of space, I explain the initial repudiation and subsequent partial recognition of the claim of the Kolkata team through shifts in the landscape of legitimate spaces of innovation—shifts to which the pronouncement of the claim itself has contributed. It is therefore crucial to not only attend to dominant stories of success in the centers of scientific power but also spotlight marginalized narratives in order to scrutinize sedimented topologies of scientific and biomedical power, and so reshape the global landscape of legitimate spaces of innovation.

Notes

1. Following Jean and John Comaroff (2012a), I define the term “Global South” not in a substantive but in a relational sense that “always points to an ‘ex-centric’ location, an elsewhere to mainstream Euro-America, an outside to its hegemonic centers, real or imagined.”
2. It would be worthwhile to investigate Dr. Subhas’s relationship with acknowledged centers of innovation during his fight for recognition. According to Prof. Sunit, both of them had been in contact with Prof. Edwards and other reproductive biologists in different parts of the world who were not always supportive of their cause.
3. Among them were the Fifth International Congress on Hormonal Steroids in New Delhi in November 1978, the satellite symposium of the congress in Varanasi, and the Indian Science Congress in Hyderabad in 1979. He also gave lectures at Gangaram Hospital in New Delhi and Gauhati Medical College (Kumar 1997:528).
4. The history section disappeared from the Ministry of Health & Family Welfare’s ART (Regulation) Bill 2010, a revised version of which awaits debate in Parliament.
5. India’s ‘first scientifically documented test tube baby’ was delivered in 1986 in Mumbai through cooperation between the Institute of Research in Reproduction and the King Edward Memorial Hospital.
6. For many, Dr. Kumar’s words gained even more gravity, since by supporting Dr. Subhas’s claim he lost his own status of having produced India’s first IVF baby (cf. Bharadwaj 2002).
7. The comparison to Louis Pasteur is intriguing. According to Latour (1983), one of Pasteur’s strengths was exactly his success in extending the laboratory to the field through a succession of displacements, thereby dissolving the inside/outside dichotomy. However, he did not start this endeavor from the home but from his laboratory at the École Normale Supérieure—a space endowed with credibility from the outset.
8. Even Dr. Kumar commented critically on the rugged transition from concealed experimentation in a hidden space to public declaration. He noted that although similar controversies emerged in the United Kingdom, a
“combination of transparency, scientific debate as well as discussing moral, ethical, legal and religious issues” made the process acceptable to the general public as well as the scientific community (Kumar 1997:530).

9. They explained that in the same way that crabs trapped in a basket prevent each other from climbing out of their prison (by pulling more advanced crabs downwards), Dr. Subhas’s colleagues prevented him from receiving recognition. A recent documentary on Dr. Subhas by Rajib Sarkar is entitled “Effect of Indian Crab Syndrome” (Deccan Herald 2014).

10. See Itty Abraham (2006) for a discussion of the ideological reliance of modern nationalism in India on local knowledge, and Gyan Prakash (1999) for the long-lasting intimate relationship between science, colonialism, and nationalism.

11. Simultaneously, however, they emphasize their international connections and their training from commonly acknowledged centers of innovation.

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