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Unmaking a National Space Legislation for India: Indigenizing Space Law Through the “Organic Science” of the Indian Space Program

S. G. Sreejith

O.P. Jindal Global University, sgsreejith@jgu.edu.in

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**UNMAKING A NATIONAL SPACE LEGISLATION FOR
INDIA: INDIGENIZING SPACE LAW THROUGH
THE “ORGANIC SCIENCE” OF THE
INDIAN SPACE PROGRAM**

S.G. SREEJITH*

ABSTRACT

This article addresses, in a framework, the efforts to make national space legislation for India. It identifies that such efforts are in a forgetfulness of the indigenous specialties of the Indian Space Program, particularly of its science which has India advancing in space technology. All efforts in making a national space legislation have become an imitation of efforts elsewhere because of their absorption in the otherness of epistemologies foreign to the Indian self. The article recognizes that, for the continued success of India as a space faring nation, legislation or policy, as the case may be, needs to recover the indigeneity of the science of the Indian Space Program. Hence, this article builds a framework that can challenge the misguided ambitions of the advocates of national space legislation. It also includes an Indian narrative on human space exploration based on the national experience of India on matters relating to space. The article also proposes means for India to continue to fare in space through a reimaged triad of science, legislation, and policy.

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* M.Phil. (JNU), LL.D. (University of Lapland), Associate Professor and Associate Dean (Academic Affairs), Executive Director, Center for International Legal Studies, Jindal Global Law School, O.P. Jindal Global University. The author thanks the participants of the “International Conference on Future Developments in Space Law,” West Bengal National University of Juridical Sciences, Kolkata (May 10, 2016), for their comments on an earlier version of this article and also Sandeepa Bhat for the invitation to the conference. The author also thanks Sushant Chandra for his written comments on the afterword.

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I. INTRODUCTION

SINCE THE INAUGURATION of the Indian Space Program (ISP), the science on which it is based has a characteristic of “indigeneity” to it. “Indigenous science” is based on the cultural characteristic of a nation that results in a refusal to share areas colonized by mainstream Western science. The pioneers of Indian space science such as Vikram Sarabhai and Satish Dhawan, and later A.P.J. Abdul Kalam, envisioned and practiced a space program for India based on scientific self-sufficiency through localized advanced technology. Their down-to-earth approach defined space technology as a means for helping humanity in its collective self-becoming. They placed technology at the services of humanity, which contrasts starkly to the totalizing approach of Western science. However, does India’s current space policy properly mirror the indigeneity of India’s sciences? Or does it more closely resemble international space law (which is a Western artifact based on a war-and-peace framework) in abject rejection to the high ideals of the ISP? Considerations like these cannot be overlooked—especially since India is currently framing national space legislation.

This article creates a comprehensive argument so that any future legal activity regarding national space legislation for India does not ignore the ontology of Indian space science. Part I ar-

gues that, amid many other scientific approaches, the Western science of the Cartesian-Newtonian model has eclipsed other sciences through its violent claims of superiority. It explains briefly how Western science became “the-science” by marginalizing indigenous sciences.

In Part II, this article argues that human space exploration is primarily based on “the-science” and that the violence of such is ingrained in the exploration and use of outer space, the moon, and other celestial bodies. In that advance, space science has developed a consciousness that alienates basic human values, and instead submits itself to the service of markets.

Part III demonstrates how the science of the ISP differs fundamentally from Western science. It explains that the indigeneity is a key characteristic of the ISP, and that it follows the ontological realities of the universe and the socioeconomic conditions of the people of India (as opposed to having the highly-politicized hegemonic worldview of the international space program). Lastly, this part provides a general Indian narrative of space exploration through the works of Indian space scientists Vikram Sarabhai, Homi J. Bhabha, Satish Dhawan, and A.P.J. Abdul Kalam.

In Part IV, the article delves further into international space law, and how it is a product of bipolar politics and consensual diplomacy, far off from the philosophy of the ISP. The science underlying international space law is the “big science” of political nationalism. In using big science, international space law has forged a tense forum for the once-Cold War combatants to flaunt power to one another.

Part V deliberates national space legislation for India and its current efforts. Its primary objective is to analyze the ISP’s scientific uniqueness. It critically reviews the work done up until now—which is caught between a madness for modernity and the classicism of international law—and yields results that skew the ISP from its characteristic indigeneity. Therein, the article asks what is rarely asked—*Why does India not have national space legislation?* Part V argues that the ISP was better off before, and that the current demand for national space legislation is based on misconceptions about the role of law. Finally, the article provides some suggestions to nonetheless streamline national space legislation, if at all, to include the visions of the ISP, particularly, to sustain and protect the indigenous science as has always been before. In this scheme, it is the organic science of the ISP that becomes the paradigm for any possible renewal.

II. THE VIOLENCE OF WESTERN SCIENCE: “THE-SCIENCE” AND “SUCH-AND-SUCH SCIENCES”

The objectivity of science is largely undisputed. Further, little deliberation is given to the fact that scientific objectivity is secured by social concerns.¹ Such a socialness of science instantly requires itself to consider human wellbeing in the world.

Perhaps the socialness of science is a matter of conversation among the few scientists who take pleasure in self-infliction. But a certain few skeptics, who may be branded as “sinners of science,” have taken the absoluteness of science simply as a given, a self-referentiality. Hence, they search for science in cultural pluralities—science of “such-and-such” culture, science of such-and-such civilization. But then amid them the mighty Western science that has self-proclaimed itself as the-science, falsely singular, yet totalizing (and colonizing) all such and such sciences.

On that note, the “the-science” clean image of Western science claims that it has the means to find the truth. However, this assertion is only found by dominating other scientific approaches that often toil in the name of human development. “The-science” thus instills in its users what Michel Serres calls, “the unbearable pride of a possessive and domineering science,” and an “arrogance” which is in contrast to a devoted enthusiasm to know the marvels of nature.² This conceitedness of “the-science” makes it dangerous.

In its assertion in what conveniently appeases power, “the-science” has espoused the means of violence. Its violent ways are hidden in its claims of standing for worldly peace (while it in fact forges a war-peace framework, which is in fact a peace-through-war analytic). In order to ensure human wellbeing, “the-science,” kills hundreds of thousands of “lesser animals”: frogs, rats, and pigs have bled on lab tables for human wellbeing.³ To promote human development on this planet, “the-science” has vandalized nature; trees, rivers, and mountains have been wiped out to give humans cozy habitats. Valleys, livelihoods, and downstream ecosystems have been destroyed for

¹ See generally HELEN E. LONGINO, SCIENCE AS SOCIAL KNOWLEDGE: VALUES AND OBJECTIVITY IN SCIENTIFIC INQUIRY 3–14, 66–69 (1990).

² See CATHERINE LARRÈRE, *Ethics, Politics, Science, and the Environment: Concerning the Natural Contract*, in EARTH SUMMIT ETHICS: TOWARD A RECONSTRUCTIVE POSTMODERN PHILOSOPHY OF ENVIRONMENTAL EDUCATION 115, 120 (J. Baird Callcott & Fernando J.R. da Rocha eds., 1996).

³ M.K. GANDHI, HIND SWARAJ: THE SELECTED WORKS OF MAHATMA GANDHI 123 (1968).

constructing dams and hydroelectric projects. In order to ensure worldly peace, “the-science” has assisted in dropping bombs to wipe away anyone rebelling against peace. Whatever neutrality “the-science” claims is a sham. As Shiv Viswanathan puts it, either that science is subverted by politics, or that science’s perversions come into play when once it begins to dictate society.

Let us focus on the former of Viswanathan’s two-part statement, that science, which is otherwise serene and pacified, is subverted by virulent political forces of the social world. Ashish Nandy has a similar forethought on the politicization of science: “May the sources of violence [of science] lie partly in the nature of science itself? Is there something in modern science itself which makes it a human enterprise particularly open to co-optation by the powerful and the wealthy?”⁴ Perhaps, yes. But note, science invited people of the world to instrumentalize for their own self-indulgence, for science promises to become the best instrument to ensure the continuity of hedonism. It is the consistency of science with sensual self-indulgence, and the promise for material bliss, that perhaps caused science to become the instrument of politics?

The second view of Viswanathan is that science, which is otherwise disciplined, turns unruly when it becomes an opportunity for social ordering. This is particularly evident from the role played by science in the “civilizing mission” of the imperial powers. The modernist approach of science annihilated the indigenous sciences that had been used to improve the quality of life of the peoples in the colonies. For example, biology distorted indigenous life sciences through the process of, what Londa Schiebinger calls, “bioprospecting.”⁵ Specifically, the Western scientific standards of hygiene and sanitation as portrayed in scientific media reduced the indigenous practice of hygiene to a glorified uncleanliness. The “scientific racism” of these forces forged pseudoscience to demote any inquiries that were part of a primitively scientific culture.⁶ Science thus became the champion of the politics of knowledge.

Viswanathan concludes his critique with the observation that science as it is today—highly politicized and bureaucratized—

⁴ Ashis Nandy, *Introduction: Science as a Reason of State*, in *SCIENCE, HEGEMONY, AND VIOLENCE: A REQUIEM FOR MODERNITY 2* (Ashis Nandy ed., 1988).

⁵ Suman Seth, *Putting Knowledge in Its Place: Science, Colonialism, and the Postcolonial*, 12 *POSTCOLONIAL STUD.* 373–74, 378–79 (2009).

⁶ *Id.* at 375.

represents a “crisis of conscience.”⁷ Not only has science lost its innocence and civility, but it also has become “allergic to democracy.”⁸ “What should have been a partnership of openness [has] become a dull civics, where ‘the scientific method’ as an ideology became a Victorian corset constricting creativity.”⁹

“The-science’s” violent and perverse tendency to totalize knowledge does not and should not deny the existence and worth of “such-and-such sciences.” This term signifies the idea that there are knowledges here, there, and elsewhere, that are scientific in the puritan, non-Western sense of the term. These knowledges are savagely indigenous from Western views of science, and provide alternative paradigms to “the-science.” This alternativeness stems from the culture of its nation of origin. As Gandhi intended in *Hind Swaraj*, the “tinsel splendour of glassware” cannot dazzle a community that has found aesthetic satisfaction in the serene flame of “handmade earthen saucers.”¹⁰ He holds that true science is an experiment on the self rather than on the other, and science should help mankind to come closer to its maker.¹¹ This approach is a holism wherein science helps the *microcosm* in a relative existence to persistently try to relate its Heideggerian “everydayness” to an all-encompassing cosmic *macrocosm*. Their overlying theme is to achieve the union between the microcosm and the macrocosm through right knowledge and right practices. In that scheme of things, the role of scientists lies “neither with the exploiting market nor with the stifling state, but with the people,” and in tenderly nursing them to recover from the vices of the material world.¹²

III. “THE-SCIENCE” AS THE SCIENCE OF SPACE EXPLORATION

Earlier space science, through its policies, is defined as the knowledge meant to conquer the distant spaces of the cosmos. The conquest was meant to demystify the exoticism that was attached to the spaces above the earth, in what Hannah Arendt

⁷ See SHIV VISVANATHAN, A CARNIVAL FOR SCIENCE: ESSAYS ON SCIENCE, TECHNOLOGY, AND DEVELOPMENT 148–50 (1997).

⁸ SHIV VISVANATHAN, THEATRES OF DEMOCRACY: BETWEEN THE EPIC AND THE EVERYDAY 255 (2016).

⁹ *Id.*

¹⁰ GANDHI, *supra* note 3, at 158.

¹¹ See Shambu Prasad, *Towards an Understanding of Gandhi’s Views on Science*, 36 ECON. & POL. WEEKLY 3721, 3724–25 (2001).

¹² *Id.* at 3730.

depicts as the “rebellion against human existence.”¹³ In other words, the conquest of outer space is the ultimate conquest for science: of not only the physical spaces outside the earth but also the meta-spaces of human minds which intimately believed that the cosmos—its crystalline planets and stars—belonged to them.¹⁴ For scientists, such sentiments are too lay; for them, “man is no more than an observer of the universe in its manifold manifestations.”¹⁵

Norman Mailer denounces the goals of space science in the same vein as Arendt, that the conquest of space is seen as the means to salvage humanity from its “metaphysical pits.”¹⁶ Though this in fact was an effort at de-romanticizing the cosmos, supporters of space conquest called the ambition of space sciences a desire to demystify humanity from the awful exoticism surrounding the cosmos, and by conquering it, to ground it on human utility. Scientists deemed it as the glory of modern science, says Arendt, “that it has been able to emancipate itself [and its followers] completely from all such anthropocentric, that is, truly humanistic concerns.”¹⁷ Thus space science made its materialist beginning by proclaiming to disconnect humanity from its romanticism. The scientists rejected as old-style and redundant the perspective that cosmic harmony, the actual universe, is an ontological category of the non-dualism of mind and matter. Instead, holding on to a rational dualism, they held that one would “have to step outside any merely given sequence or series of occurrences if they wanted to discover the overall beauty and order of the whole, that is, the universe.”¹⁸ Worse was yet to come: science thenceforth told mothers not to tell their children that stars are serene twinkling diamonds, but rather fireballs emitting heat flares.

The first conception of space science was the science of rockets. Early applications of rocket science include, for example, the Chinese using gunpowder in tubes that were attached to arrows of fire to attack targets, applying the Newtonian third law

¹³ HANNAH ARENDT, *THE HUMAN CONDITION* 2 (1958).

¹⁴ See Hannah Arendt, *The Conquest of Space and the Stature of Man*, 18 *THE NEW ATLANTIS: J. OF TECH. & SOC'Y* 43, 44–45, 51–54, <http://www.thenewatlantis.com/publications/the-conquest-of-space-and-the-stature-of-man> [<https://perma.cc/49UR-MS3D>].

¹⁵ *Id.* at 44.

¹⁶ NORMAN MAILER, *OF A FIRE ON THE MOON* 471 (1970).

¹⁷ Arendt, *supra* note 14, at 43.

¹⁸ *Id.* at 48.

of motion.¹⁹ Later on, Robert H. Goddard, known as the father of modern rocket science demonstrated the application through the “bazooka” and subsequently offered to extend its scope to the U.S. Navy for their on-field activities.²⁰ The leitmotif for furthering research in rocket science for Goddard was effective warring, as he stated in *A Method of Reaching Extreme Altitudes*: “Smokeless power rockets, during World War II, have grown in size and controllability, but have not given much higher jet velocities than were earlier obtained. Multiple charge, or reloading powder rockets appear still to be [developed].”²¹

Thus, rocket science began by exploring the possibilities of destruction and violence. Elsewhere, some of the early rockets like V-2s were given the technical ability to travel 300 kilometers to destroy civilian and military targets. There was also a dangerous optimism that surrounded this discovery:

[T]he postwar period became the age of the rocket; it actually began during World War II, with the use of rockets in aircraft, to supplement artillery, and with the German development of the V2 long-range ballistic rocket. By the 1960s ballistic rockets had achieved greater accuracy and extended their range to over 5,000 miles. Such missiles still defied anti-aircraft defense and could carry a nuclear warhead far more powerful than the two bombs dropped in World War II.²²

Rocket science thus ripened to a state of salience through World War II, the violent elements of which would remain with rocket science. Even on a more operational level, the action force, thrust, and the reaction force based on Newton’s Third Law of Motion roll together to make rocket launch have a certain violent force.

With rockets all around, in 1957, space science succeeded in the first satellite launch, the launch of *Sputnik*. Policy circles celebrated *Sputnik* and its science as a power-gain. Proclamations of such a power-gain by the launchers of *Sputnik*, and the laying down of policies on the possible utilization of space power by the gainers put the rest in qualms about the impending risk of space programs. In the United States, President Eisenhower was urged by the American scientific and policy intelligentsia to

¹⁹ STEVEN OTFINOSKI, ROCKETS 11 (2007).

²⁰ See Dr. Robert H. Goddard: American Rocketry Pioneer, NASA GODDARD SPACE FLIGHT CTR. (Rob Garner ed., Aug. 4, 2017), http://www.nasa.gov/centers/goddard/about/history/dr_goddard.html [<https://perma.cc/K5K3-LQH7>].

²¹ ROBERT H. GODDARD, ROCKETS: TWO CLASSIC PAPERS ix (2002).

²² ARCHER JONES, THE ART OF WAR IN THE WESTERN WORLD 597 (1987).

enter into a dialectic of science with the Soviet Union to ensure the participation of the United States in the space race.²³ This was followed by strategic reforms in science education that focused on developing a utility-based high science that can be equally useful to the U.S. government.²⁴ Soon, through the National Defense Education Act, 1958, the Eisenhower Administration gathered the brightest students with the most scientific ingenuity and acumen to participate in the production of high science and help the government in its dialectic war of science-power; as the Act lays down, “[t]o strengthen the national defense and to encourage and assist in the expansion and improvement of educational programs to meet critical national needs; and for other purposes.”²⁵ This degradation of science to a utility-function, in abject neglect of the joyful curiosity and playfulness of the scientists of an era, however, was subject to criticism by American scholars, writes Hans J. Morgenthau:

[T]he commitment of unmatched resources for certain scientific and technological projects chosen by the government exerts a well-nigh irresistible attraction upon scientific and industrial research. Thus the direction of scientific exploration and technological innovation is no longer left to the free interplay of intellectual curiosity and technical ingenuity but is predetermined by the interests and the power of the government.²⁶

Science soon became a language for speaking power among the nations, and space science developed into a privileged possession, prompting all powers-seekers in a war of physics in the politics of “big science.”²⁷

Within a few years, the U.S. Apollo Missions added a fillip to the big science project. Apollo, in fact, became a realization of the dialectic advantage the United States was looking for in the dialectic of science with the Soviet Union. It was also a dialectical match for the scientific nationalism that the launch of *Sputnik* and Yuri Gagarin’s space travel had infused among the

²³ WAYNE J. URBAN, *MORE THAN SCIENCE AND SPUTNIK: THE NATIONAL DEFENSE EDUCATION ACT OF 1958* 80–81 (2010).

²⁴ *Id.* at 156–59.

²⁵ National Defense Education Act of 1958, Pub. L. No. 85-864, 72 Stat. 1580, http://wwwedu.oulu.fi/tohtorikoulutus/jarjestettava_opetus/Troehler/NDEA_1958.pdf [<https://perma.cc/AF2W-F42S>].

²⁶ Hans J. Morgenthau, *Modern Science and Political Power*, 64 COLUM. L. REV. 1386, 1392 (1964).

²⁷ ZUOYUE WANG, IN *SPUTNIK’S SHADOW: THE PRESIDENT’S SCIENCE ADVISORY COMMITTEE AND COLD WAR AMERICA* 142, 144 (2008).

Soviet populace.²⁸ Apollo gave Americans a similar sense of nationalism, a confidence to speak and an imagination to act.²⁹ At the international level, the advantage that the United States gained from the Apollo Mission provided an effective position in the diplomatic negotiations that led to a legal framework for the moon and other celestial bodies.

Meanwhile, in practice, on the functional scientific front, space science split into fragments and further divided into scientific projects for bids. The aristocracy of space science—its inherent inquisitiveness about the mysteries of the universe, its closeness to the collective existence of humanity, and its satisfaction of human curiosity—was lost as the many space sciences began to compete for funding, as captured by an observer in NASA:

The planetary science community preferred smaller, tested spacecraft flying short missions over large, expensive, complex and lengthy projects. They feared that the government might cancel their smaller projects in times of tight budgets in favor of a few expensive high-profile missions. Moreover, with small inexpensive spacecraft launched at relatively short intervals, scientists could more easily follow up on new discoveries than they could with one large complicated spacecraft that took many years of preparation.³⁰

Thus, space science in the United States, which otherwise started on grand counterclaims against the security-centered Soviet science, abashedly yielded to economic efficiency. This in fact reduced American space science to items of convenience in addition to the epistemological reduction of big science to cut-rate technology.³¹

Today, in modernity, space science is a bearer of historical consciousness. That consciousness has distanced itself from human considerations of all it has become, the grimmest is its role as a medium of political communication between power-blocs. It also has a meanness—stemming from the freedom it has from human-specific values—such that by using it, the most destructive ambitions can be fulfilled. It masks its destructivity

²⁸ See Asif A. Siddiqi, *Competing Technologies, National(ist) Narratives, and Universal Claims: Toward a Global History of Space Exploration*, 51 *TECH. & CULTURE* 425, 429–30 (2010).

²⁹ *Id.* at 426, 430.

³⁰ Andrew J. Butrica, *Voyager: The Grand Tour of Big Science*, in *FROM ENGINEERING SCIENCE TO BIG SCIENCE* 251, 253–54 (Pamela E. Mack ed., 1998).

³¹ *Id.* at 253–55.

behind the bigness (sheer quantity and magnitude of its sphere of application) of its ambitions—”thou cannot gain without pain.” Finally, as a postscript, space science today is neoliberal and only meets market demands: all set to branch off to become a well-nourished sidekick to a global greed.

IV. INDIGENEITY OF THE SCIENCE OF THE INDIAN SPACE PROGRAM

The science of the ISP is based on the imagination of C.V. Raman, that “science is material and spiritual wealth.”³² In the same vein, Vikram Sarabhai, the father of the ISP and a disciple of C.V. Raman, held dear the belief that India’s space program, an integration of the nation’s cultural and civilizational aspirations, shall be at the service of the nation and its peoples.³³ Moreover, Sarabhai published his work in a Nerhuvian era, wherein science was in search of an indigeneity. Amrita Shah explains in her biography of Sarabhai: “[I]t had been fashionable for Indian scientists to design their research projects in such a manner that some peculiarity or other of indigenous conditions would be highlighted.”³⁴ As the leader of the ISP, Sarabhai’s vision was to empower India through a space science, and of course the technology thereof, through scientific self-sufficiency. Ajey Lele echoes Sarabhai’s vision: “[Sarabhai] stated that India’s space programme would be civilian in nature, with a focus on the application of space technology as a tool for domestic socioeconomic development.”³⁵ Further, Sarabhai believed that the real advancement in space science lies in making space benefits available to the common populace.³⁶ His initial effort was to explore indigenous possibilities in realizing that goal. This was in fact a desire to overcome the colonial abjection of a left-behind poor economy. It was the dream of the early men of the ISP that a turn to indigeneity would help them avoid the horror of a technological re-colonization. This sentiment is reflected in words of Sarabhai:

³² Sir Chandrasekhara Vankata Raman, *An Indian Academy of Science*, 1 CURRENT SCI. 335, 335 (1933), http://www.currentscience.ac.in/Downloads/article_id_001_11_0335_0337_0.pdf.

³³ See AMRITA SHAH, VIKRAM SARABHAI: A LIFE 39–42 (2007) (discussing Raman’s influence on Sarabhai).

³⁴ *Id.* at 62.

³⁵ Ajey Lele, *India and Other Maturing Asian Space Enthusiasts*, in YEARBOOK ON SPACE POLICY 2012/2013 271, 273 (Cenan Al-Ekabi et al. eds., 2015).

³⁶ K. KRISHNA MURTY, 50 TIMELESS SCIENTISTS 168 (2008).

There are some who question the relevance of space activities in a developing nation. To us, there is no ambiguity of purpose. We do not have the fantasy of competing with economically advanced nations [in the exploration of the moon or the planets or manned space-flight]. But we are convinced that if we are to play a meaningful role nationally and in the community of nations, we must be second to none in the application of advanced technologies to the real problems of man and society.³⁷

However, Sarabhai was also conscious that getting too localized in the name of indigeneity would hardly yield results, let alone any international recognition. K. Krishna Murty writes, “He [Sarabhai] realised the traditional approaches do not really yield desired fruits and decided to harness the vast indigenous technological skill and knowledge for a revolution in the fields of communication, meteorology, remote sensing and education.”³⁸ The idea was not to allow an integration of Indian and Western space sciences; rather, it was to set a dialectical connection between the culturally-given communitarian scientificism of the ISP and the security-centered expansionist science of the West. Asif A. Siddiqi paraphrases such stance in a postcolonial tone: “[T]he Indian space program, as manifested in its technology, its goals, and its architects, represents a kind of modernity that is neither completely Western nor fully postcolonial—it is a vision of modernity that is decentered, constantly mutating, often contradictory, and globalized.”³⁹

In 1963 and under Sarabhai’s leadership, India launched its first rocket from Thumba Equatorial Launching Station at Thiruvananthapuram.⁴⁰ In this feat, India broke the prevalent concept of rocket as a projectile; it instead created the notion of civilian rockets, and the imagination of getting to know the universe and drawing on its immense resources and possibilities.⁴¹ For the first time, the streaking of a rocket toward the sky became a symbol of hope for a gracious universe becoming the means for the betterment of life on earth. This optimism of an entire culture, one which deemed the universe as the plenary consciousness of humanity was well reflected in the words of Sarabhai: “The natural scientist looking for the subtle links through which

³⁷ G.S. Sachdeva, *Space Policy and Strategy of India*, in *SPACE STRATEGY IN THE 21ST CENTURY: THEORY AND POLICY* 303, 303–4 (Eligar Sadeh ed., 2013).

³⁸ MURTY, *supra* note 36, at 167.

³⁹ Siddiqi, *supra* note 28, at 435.

⁴⁰ SHAH, *supra* note 33, at 126–28.

⁴¹ *See id.* at 128–32.

the sun affects the earth and our lives has at last acquired in the exploration of space a dramatic new capability for study.”⁴²

Sarabhai set the patterns for the ISP by drawing on the Nerhuvian socialist model of science as a “public thing” to promote national integration and economic self-sufficiency in the larger interest of the nation. As if self-sufficiency and indigeneity are self-fulfilling prophecies, two years later *Science* would report:

The Indians chose to manufacture foreign rockets . . . This is why at least 12, and perhaps as many as 24, Centaures will be built in Bombay. In contrast to the first payloads, most of the 20 scheduled to be flown during the year ending 31 March 1966 will be constructed in India.⁴³

The pattern set by Sarabhai was well supported by Homi J. Bhabha, a friend and collaborator of Sarabhai on many fronts. Bhabha believed in the “trickle-down theory of development,” that benefits of knowledge production should reach even those on the lower strata of society.⁴⁴ Like Sarabhai, Bhabha also believed in indigeneity, for indigenous manufacturing of equipment is the process of construction of cultural identities through the product—the product then becomes a cultural category and pride, while developing local expertise.⁴⁵ Reviewing the role and contributions of Bhabha to Indian science, George Greenstein provides a striking illustration of the realization of the egalitarian ambitions of the ISP through an indigenous approach dearer to Bhabha, which is worth quoting in full:

The most impressive example I know of is the Satellite Instruction Television Experiment. Under this so-called SITE program, the government gave each village a television set, and educational programs were beamed nationwide via a geosynchronous satellite. Care was taken that these programs concerned themselves with technology appropriate to village life: crop rotation, water purification, and the like . . . The antennas by which these satellite broadcasts were received themselves were a triumph of appropriate technology—a mere few wires suspended from poles stuck in the ground. The SITE experiment reached twenty thousand villages and went on for a year; its place has since been

⁴² Comm. on the Peaceful Uses of Outer Space, Rep. of the Legal Subcomm. on Its Twenty-Third Session, U.N. Doc. A/7285, at 33 (1968).

⁴³ Victor K. McElheny, *India's Nascent Space Program*, 149 *Sci.* 1487, 1488 (1965).

⁴⁴ George Greenstein, *A Gentleman of the Old School: Homi Bhabha and the Development of Science in India*, 61 *AM. SCHOLAR* 409, 414 (1992) (internal quotations omitted).

⁴⁵ *See id.* at 417.

taken by a series of half-hour broadcasts each night. This modest, low-technology enterprise has done more to benefit the bulk of India's population than any amount of "Western-style" science.⁴⁶

The communitarian nature of the ISP, relayed through a proletarian textualism, also had a nation-building potential such that the ISP became a means for national integration, thanks to its recognition of the cultural specialties of the nation. However, while the ISP was a cultural artifact, it co-opted the concept of culture as a unified Indian culture *inter alia* "by constructing a truly national television system."⁴⁷ Pretty much as Gandhi had portrayed *charkha* (the spinning wheel) as symbolic of Indian indigeneity and unification, the ISP has constructed an iconography of satellites that has provided India the imagination of indigeneity, self-sufficiency, and unification. Brian Frank, in a piece appropriately titled *Satellites and Plowshares*, succinctly states in a similar vein: "[A]lmost any description of the Indian space program includes a map, of all of India, without any boundaries whatsoever, but showing all of the different centers and laboratories."⁴⁸

After Bhabha's and Sarabhai's demise, it was only natural that the ISP fell into the hands of Satish Dhawan, who—according to Amulya K.N. Reddy—is an "embodiment of the fusion of science and human values."⁴⁹ In setting the agenda for the ISP, as if in reverence to the Vedic premise that sun is a representation of *Brahman*, the cosmic self, Dhawan shared the sentiments of the forefathers of ISP that the sun is the "driving force for almost everything on earth, be it the weathers, rivers, vegetation or essentially life itself."⁵⁰ Hence, for him and his predecessors, exploring the sun and the outer spaces of the earth offered immense possibilities.⁵¹ However, Dhawan's vision of the ISP was not the least bit transcendental. Rather, he believed in translat-

⁴⁶ *Id.* at 414.

⁴⁷ Brian Frank, *Satellites and Plowshares: The Potential Demise of the Indian Space Program*, 15 HARV. INT'L REV. 54, 55 (1993).

⁴⁸ *Id.*

⁴⁹ Amulya K.N. Reddy, *A Tribute to Satish Dhawan*, 37 ECON. & POL. WKLY. 195, 195 (2002).

⁵⁰ SMT. RAJESHWARI KRISHNA, DR. SATISH DHAWAN: A BIOGRAPHY OF SATISH DHAWAN IN ENGLISH (L.S. Seshagiri Rao ed., 2008).

⁵¹ *Id.*

ing the possibilities space exploration offered for the benefit of people at large.⁵²

Dhawan was highly sensitive to the needs of the Indian populace and knew very well the benefits of bringing science to them. Hence, he kept a bifurcated approach to science: 1) science as an epistemology that broadened human understanding about its existential reality; and 2) science as a means to “augment human welfare or mitigate human suffering.”⁵³ The space program under Dhawan, writes Ramachandra Guha, was guided by the spirit of inquiry and scientific humanism, which is obvious from the fact that Dhawan believed that “satellite technology must be used to garner information useful in agriculture and other sectors of the economy, and to promote distance learning in remote areas not easily served by other forms of communication.”⁵⁴

He was cautious and reflective in deploying space projects, for he believed that any inappropriate intersection between the technology and the socioeconomic contexts could be disastrous for the nation. A foreign product, no matter its utility elsewhere, cannot serve the socioeconomic context of India. Dhawan explained this in his Aryabhata Lecture delivered on August 2, 1985:

Many of the problems of the third world in S&T applications are related to this issue and often are compounded by internal socio-political weaknesses and the distortions generated by foreign governments and international organizations which influence aid programmes with the selectivity mechanisms based on parameters derived from applications in the advanced countries.⁵⁵

Dhawan’s efforts at indigenously developing home-based space applications (designed to suit the socioeconomic conditions and needs of the people) stemmed out of such caution and reflections.⁵⁶

Such an indigeneity in his approach, however, does not constrain him from exploring international possibilities. He wanted the Indian Space Research Organization (ISRO) to be internationally connected through networks. The logic of such an ap-

⁵² Y.S. Rajan, *An Article on Prof. Sathish Dhawan*, Y.S. RAJAN: ARTICLES (2016), <http://www.yusrajan.com/index.php/articles/122-an-article-on-prof-sathish-dhawan-by-y-s-rajan> [<https://perma.cc/TGJ4-Q7CH>].

⁵³ RAMACHANDRA GUHA, *THE LAST LIBERAL & OTHER ESSAYS* 89 (2004).

⁵⁴ *Id.*

⁵⁵ Rajan, *supra* note 52.

⁵⁶ *Id.*

proach lies in the prudence of Sarabhai that the ISP, though not subscribed to international processes, should stay connected to the political and international decision-making regarding space.⁵⁷ In pursuing this, Dhawan, following the footsteps of Sarabhai, displayed the eclecticism of what could be called a “dialectic of diplomacy” for gaining “elusive insights.”⁵⁸ This perspective can be best aligned with the concept of “fruitful dialogues” of Martin Weber, “where the purpose is to present a perspective on normalized practices, time-honored rituals, or at-the-ready assumptions, which renders these strange, specific, particular, and potentially subject to renegotiations.”⁵⁹ Through the dialectic mill of international forums, the ISP intended to gain an enabling perspective on its uniqueness. This stance of Sarabhai and Dhawan is a reflection of Marxist-Leninist internationalism that considers “international” as a dialectic site and a social process for the discovery and rediscovery of the nationalist self.⁶⁰ A finer rationalism for this is the fact that Nerhuvian socialism, which was the leitmotif of the ISP, has in it a large dose of the Leninist scientific socialism as against the Trotskyian dogmatic socialism.⁶¹

The ISP’s commitment to self-sufficiency through indigeneity was carried further by the ISRO’s subsequent chairs. In the early 1990s, on being unsuccessful at the international political level to import cryogenic rocket technology due to neoliberal policy objections, the ISRO attempted to indigenously devise the same for its GSLV satellites. Though implementation of this project was delayed due to unanticipated reasons, the ISRO eventually succeeded in developing the indigenous cryogenic engine. The technology was then used in many GSLV projects and in the lunar mission *Chandrayan*.⁶²

⁵⁷ See *From Fishing Hamlet to Red Planet: Book Review & Commentary*, NEWSpace INDIA (Jan. 4, 2016), <http://www.newspaceindia.com/from-fishing-hamlet-to-red-planet-book-review-commentary/> [https://perma.cc/X7BN-EHUU].

⁵⁸ Martin Weber, *Critical Theory and Contemporary World Politics*, 12 INT’L STUD. REV. 444, 449 (2010).

⁵⁹ *Id.*

⁶⁰ See STEVEN C. ROACH, CRITICAL THEORY OF INTERNATIONAL POLITICS: COMPLEMENTARITY, JUSTICE, AND GOVERNANCE 7–8 (2010).

⁶¹ See Saroj Malik, *Socialist Ideas of Jawaharlal Nehru: Ideal and Reality*, in THOUGHT AND VISION OF JAWAHARLAL NEHRU 72, 72–74 (Suneera Kapoor ed., 2005).

⁶² BRIAN HARVEY ET AL., EMERGING SPACE POWERS: THE NEW SPACE PROGRAMS OF ASIA, THE MIDDLE EAST, AND SOUTH AMERICA 225 (2010).

It is interesting that Indian citizens' pride regarding space achievements has such a cultural confidence to it: that the victory of the scientist is the victory of the nation, its culture, and its civilization. Furthermore, in India, the masses idolize the scientist as the liberator of the nation from its underdevelopment of primitiveness and onto to the luxuries of modernity. For Indians, scientists are not simply national heroes but gurus or guides who help the nation in re-discovering its national selfhood. The scientist, for them, is the possessor of the knowledge about the universe and about human existence in the grand scheme of things.

A.P.J. Abdul Kalam, one of the rocket boys of Sarabhai who would become the eleventh President of India, through his life and work, has ignited a similar imagination in the collective consciousness of Indians. Kalam believed that "science is the only reliable way to understand the natural world, and its tools, when properly utilized, can generate dazzling insights into material existence."⁶³ In the spirit of such a faith, Kalam deemed himself to be indigenous.

Kalam's initiation into indigeneity was through Sarabhai, who entrusted Kalam with the task of developing an indigenous equivalent of the Russian RATO plane.⁶⁴ Later on, when the ISP entered into an active phase of indigenization, Kalam became the pioneer of this so-called "swadeshi space programme."⁶⁵ Under this program, Kalam led the team that designed the SLV-3 project, the first indigenously developed rocket to put a satellite in low earth orbit.⁶⁶ According to Arun Tiwari, Kalam's ex-colleague and biographer, SLV-3 was inspired by the Scout design of the United States. However, "though SLV-3 resembled Scout in its morphology, the sub-assembly and the fuel assemble were designed afresh by Indian scientists and engineers."⁶⁷

Despite the neoliberal era in which Kalam continued to work for the ISP and India at large, he never subscribed to the abandoning of the the ISP's indigenous science—even though global ambitions of successive governments necessitated scientific interdependence. Science did continue to assume a market character in India; however, the "civic science," as Visvanathan calls

⁶³ A.P.J. ABDUL KALAM & ARUN TIWARI, *TRANSCENDENCE: MY SPIRITUAL EXPERIENCE WITH PRAMUKH SWAMIJI* 167 (2015).

⁶⁴ ARUN TIWARI, *A.P.J. ABDUL KALAM: A LIFE* 68–73 (2015).

⁶⁵ *Id.* at 71.

⁶⁶ *Id.* at 77–79.

⁶⁷ *Id.* at 78.

it, of a Nerhuvian-Sarabhaian imagination about science continued to be the staple for fulfilling the socioeconomic needs of the country, whereas on the global space market India provided launch and related technological assistance to foreign states.⁶⁸ In such transformative times, Kalam endeavored to hold the organic nature of the science of the ISP, while not foiling the scope for the country in its political madness to sustain itself in the markets. This was a vision well shared by C.V. Seshadri. As Visvanathan paraphrases: “Science and technology have always been and will always be the pursuit of exploitable knowledge with all the artefacts of such exploitation. All we can do is seek to minimize these effects.”⁶⁹

On balance, the science of the ISP has a uniqueness—it has a genealogy of self-inquiry, be it into the individual selfhood, the collective selfhood (the nation), or the universe (cosmic self) in its manifold microcosmic and singularly macrocosmic forms. The inquiring subject of that science has a sense of “I-ness.” Visvanathan explains: “there is the I of evolution, of cosmology, of genealogy, of civilisation, [and] of citizenship.”⁷⁰ However, that I-ness is today “denatured” and supplanted by considerations on selfhood that are alien to science as it is understood and employed by the ISP.⁷¹ And yet, it is largely a science of the self—the individual and the collective—which was divergent, socialistic, sensual, playful, and communitarian. We have called it indigenous, for it had an imagination engendered by a civilizational glory.

V. THE-SCIENCE OF INTERNATIONAL SPACE LAW

International space law is largely a product of bipolar politics and consensual diplomacy from the Cold War era. The Cold War, despite the political thematization it has been subject to, was primarily fought on science. Further, it should be noted that the science of the Cold War was the “big science,” which con-

⁶⁸ See C.V. Seshadri & Shiv Visvanathan, *The Laboratory and the World: Conversations with C.V. Seshadri*, 37 *ECON. & POL. WKLY.* 2163, 2164 (2002) (discussing civic science); see also *The ISRO Journey: A Fascinating Tale of India's Attempts Towards Space Domination*, *HOMEGROWN* (July 10, 2015), <http://homegrown.co.in/article/27376/the-isro-journey-a-fascinating-tale-of-indias-attempts-towards-space-domination/> (discussing India's market participation) [<https://perma.cc/S2VX-EKNQ>].

⁶⁹ Seshadri & Visvanathan, *supra* note 68, at 2170.

⁷⁰ *Id.* at 2164.

⁷¹ *Id.*

tained ambition and nationalism that “ran counter to the values of open cooperation and competition that scientists traditionally believed should characterize their work.”⁷² No matter its politicized image and character, the Cold War’s connection to space diplomacy has become a framework to analyze current international space law.

Big science, both generally and in space exploration specifically, has heavy traits of nationalism and patriotism, which is what catapulted it to the most popular type of science.⁷³ Big science clearly outplayed the little science’s genealogy of space activities mainly because of the prioritization and the resultant institutionalization of the big sciences.⁷⁴ Most of the arguments supporting the ingenious creativity of scientists doing little sciences were dwarfed before the fiscal reckonings and the payoffs of big sciences.⁷⁵ Space activities in no time completely espoused the big science.

Managing big science was really a nascent art, the “politics of science.”⁷⁶ It was imperative to optimize fund allocation as well as management and allocation of human resources.⁷⁷ The whole process was in fact an institutionalization of scientific talents and resources under a liberal agenda to out-power the political opponents abroad. However, internationally, big science was not only a matter of prestige for nations, but also a means of dialogue between them. Hence, the big science therein needed to have a nonaligned image so that its dialectic possibilities were best utilized by states.

Accordingly, international space law became the dialectical medium for the Cold War combatants—it also maintained an image of neutrality in terms of its normative and communitarian aspirations. As the 1963 Declaration on Outer Space states, international space law aims to “contribute to broad international co-operation in the *scientific* as well as in the legal aspects of ex-

⁷² MARY JO NYE, *BEFORE BIG SCIENCE: THE PURSUIT OF MODERN CHEMISTRY AND PHYSICS 1800–1940* 225 (1996).

⁷³ ANDREW FEENBERG, *ALTERNATIVE MODERNITY: THE TECHNICAL TURN IN PHILOSOPHY AND SOCIAL THEORY* 44 (1995).

⁷⁴ See Comm. on Solar-Terrestrial Research et al., *A Space Physics Paradox*, NAT’L ACAD. PRESS 15, 16–17 (1994).

⁷⁵ See, e.g., G.B. Kistiakowsky, *Allocating Support for Basic Research and the Importance of Practical Applications*, BULL. ATOMIC SCIENCES 12, 17–18 (1966).

⁷⁶ See DEBAL DEB, *BEYOND DEVELOPMENTALITY: CONSTRUCTING INCLUSIVE FREEDOM AND SUSTAINABILITY* 405 (2009).

⁷⁷ *Id.* at 406.

ploration and use of outer space for *peaceful* purposes.”⁷⁸ While the normative requirement of the peaceful uses of outer space neutralized the domain, an unconditional freedom for the pursuit of science set the dialectical stage.⁷⁹

Just as “peaceful purposes” did, scientific purposes also received a conceptual treatment in space law forums. This treatment has since sufficiently accommodated the grand ambitions of the big science. Mr. Luedeking, the German representative to the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), explains: “Exploration missions should serve a clear scientific purpose such as basic research into the origin of the solar system for example. They should focus on projects of high scientific value with great potential for innovation including in non-space domains.”⁸⁰ Interestingly, the big science of the international space program, as Mr. Luedeking has helped us imagine, was not just a desire to conquer outer spaces and planets through bigly funded projects (and thereby get new dimensions to look at human existence). It also was the international opponent on the other side of the dialectical loop—to prove that we have more science than you—the more it is, the politically more advantageous the science is. The Outer Space Treaty has cast the die for such power plays in its own preamble, wherein science is set as the fulcrum for power purchases: international space law desires to “contribute to broad international co-operation in the scientific as well as the legal aspects of the exploration and use of outer space.”⁸¹

However, in international space law, science has no violent characterization as such because the big science is about bigness in terms of money and ambition rather than physical violence. That said, we cannot ignore the prevalent imagination that the domain of space has violent and destructive possibilities. Hence,

⁷⁸ G.A. Res. 18/1962 (XVIII), 1, Declaration of Legal Principles Governing the Activities of States in the Exploration and Uses of Outer Space (Dec. 13, 1963) (emphasis added).

⁷⁹ Many political forces and pressures contributed to the emergence of such a dialectical position. See EDYTHE E. WEEKS, OUTER SPACE DEVELOPMENT, INTERNATIONAL RELATIONS AND SPACE LAW: A METHOD FOR ELUCIDATING SEEDS 51–54 (2012).

⁸⁰ Comm. on the Peaceful Uses of Outer Space, 24th Sess., U.N. Doc. COPUOST/T.629 (June 1, 2011), at 10, 11, http://www.unoosa.org/pdf/transcripts/copuos/COPUOS_T629E.pdf [<https://perma.cc/L9XX-S9PN>].

⁸¹ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies 207, Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205.

international law has predicated (often equated) scientific purposes on peaceful uses.⁸² Interestingly, peaceful uses of outer space is a repetitive affirmation in every international space law, which, in a sense, shows acknowledgment that there is a potential for violence if care is not taken.

There are more hints we can take from the language of these binding agreements. Article IV of the Outer Space Treaty of 1967 has a strange and instructive juxtaposition of scientific purpose and military purpose. It dictates that “establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on celestial bodies shall be forbidden.”⁸³ Though these are not necessarily violent activities, some can be. That means they are forbidden because they are military activities that have the possibility of violence ingrained in them. However, the clause further states that “[t]he use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited.”⁸⁴ So basically, if performed in the name of science, the violent possibilities of science is not as constrained as international space law perhaps intended.

What does this sort of a semantic deconstruction convey? First, it presumes that science, which is violent per se, when predicated on peace, fetches best possible outcomes for humanity—science may be violent, but it alone can bring progress. Further, outer spaces, moons, and other celestial bodies are possible sites of the modernization of human imagination. However, if not properly regulated, war grounds of military bases could invade in the name of science. International space law hence finds that science is the classiest language, the language of power, which can impose order in space. In that perspective, Article IV is a fine illustration of science complementing the use of military in outer space, thereby determining the social process.

Second, it highlights the dispute on the definition of “peaceful”—is peaceful properly construed as “non-military” or “non-aggressive”?⁸⁵ Such a dispute exists because international space law does not prohibit military activities performed for scientific

⁸² See *id.* at 206–08.

⁸³ *Id.* at 208.

⁸⁴ *Id.*

⁸⁵ See, e.g., Bin Cheng, *Military Use of Outer Space: Article IV of the 1967 Space Treaty Revisited*, in *THE UTILIZATION OF THE WORLD’S AIR SPACE AND FREE OUTER SPACE IN THE 21ST CENTURY* 305 (Chia-Jui Cheng & Doo Hwan Kim eds., 2000).

purposes. The non-American camp always held that peace means non-military, rather than non-aggressive. As Ivan Vlassic states, “If peaceful means non-aggressive [only], then it follows logically—and absurdly—that all nuclear and chemical weapons are also peaceful, as long as they are not used for aggressive purposes.”⁸⁶ However, Vlassic’s concern, though right in its own way, would be defeated by the determining role of science such that it is only aggressive activities (that is, activities which have use of “force,” as physics primers would say), and not military activities per se, which international space law prohibits. Military activities, as long as they are for scientific purposes, are deemed peaceful. The violence that science has disgorged in international space law has caused the term “peaceful” to be limited to the narrow construction of non-aggressive.

In sum, the violence of science in international space law is a violence spewed by the “socialness of science,” which is a privileged social participation that science has in collective social decision-making. Particularly in the case of international space law, science has become the standard for measuring political power, as well as a medium for states to communicate power between one another. Further, science became the arbiter and determinant of meanings—it has a hermeneutical mission to infuse meanings in words and contexts in international space law so that Cold War combatants speak to each other through science. The science here is thus a far cry from science of the ISP—a representation of universality, self-sufficiency, and national integration—which almost certainly makes international space law less apposite an inspiration and guidance for the making of a national space legislation for India.

VI. INDIGENIZING SPACE LAW: A NATIONAL SPACE LEGISLATION?

A. WORK THUS FAR: A FORGETFULNESS BETWEEN MODERNITY AND CLASSICISM

It has indeed been the ambition of the Indian space community to have legislation that contains the indigenous imaginations and experiences of the Indian space scientists that dreamt the dream of a scientifically and technologically self-sufficient nation. As Saligram Bhat writes, “In India, scientists have represented most perspectives on space exploration and hope to

⁸⁶ *Id.* at 321 (internal quotations and citations omitted).

make national legislation in due course based on national experience.”⁸⁷ A law based on the national experience of the concerned communities will have the cultural content that brings pan-temporal appropriateness and cultural sufficiency to that law. However, of late, there is a tendency to the contrary. Sir John Mummery writes that there is a “tendency, pushed forward by political and business agendas, to value experiment at the expense of experience, to be over-optimistic and short-term about the potential of untried laws and what might be achieved by them in the long term.”⁸⁸ Mummery says that such naivety and haste will have long-term costs on the legal system and the nation.

This does not always have a healthy effect on the development of the law or on the wider social order. You can underestimate the importance not just of people, history and geography but of traditions and traditional concepts of law, justice and national and local cultural identity, which may lead to disillusionment with remote legislators and courts.⁸⁹

The efforts of the Indian space community toward making national space legislation thus far has been in such a false piety to a dazzling sense of modernity. It is a sense to cut loose from an indigeneity to certain categories of modernity which makes very little sense to the indigenous Indian self. Yet, the Indian self is all in for modernity because it promises progress as contextualized in Western discourses. It is out of this sense of modernity that scholars ask the questions: *Does India need a space legislation? Why does India need a space legislation?* Ironically, the answer to both questions is that India needs space legislation, for India is neoliberally modern, searching for participatory rights and opportunities in the market.

When speaking about national space legislation for India, scholars emphasize necessity created by the market rather than the indigeneity of the ISP—it is an abjectness that plausible alternatives do not exist. A scholarly writing evinces the moral necessity: “[T]he author is guided by the belief that national space law ought to be legislated for the purpose of creating clear and transparent regulatory guidelines for domestic industry in order

⁸⁷ Saligram Bhatt, *Inspiration to Humankind from Space Law and Science and Experience in India*, 35 J. SPACE L. 291, 292 (2009).

⁸⁸ Sir John Mummery, *Links with National Courts*, in MAKING COMMUNITY LAW: THE LEGACY OF ADVOCATE GENERAL JACOBS AT THE EUROPEAN COURT OF JUSTICE 100, 109 (Philip Moser & Katrine Sawyer eds., 2008).

⁸⁹ *Id.*

to accelerate investment and to ensure the growth and development in this capital intensive - high return strategic sector.”⁹⁰

However, the necessity to espouse the above said modernity is also policy-documented. “Indian Space Research Organisation (ISRO) has initiated a process of formulating a National Space Act for India for supporting the overall growth of space activities, with enhanced levels of private sector participation and offering more commercial opportunities.”⁹¹ Such sentiments are also widespread, reports a national daily: “[India] started the space programme and later entered the global market with products and satellite launches, [yet] India does not have a space law to protect sovereign, public or commercial interests.”⁹²

Other scholarly expositions on the topic, however, are less motivated by the call of a market modernity. Rather, their motivation stems from normative concerns. Call it the dualist, deep-seatedness of the Indian legal system apropos of international obligations; call it the normative ingenuity of Indian scholars concerning the effectuation of international law at the domestic level; either way, there has been a demand for creating domestic law in order to sift through the obligations India has incurred under space treaties.⁹³ Ranjana Kaul explains this standard Indian position on international law vis-à-vis outer space:

The requirement to harmonize international treaty obligations is inherent in the international treaties [on space law]. Harmonization thus represents the essential physical link, as it were, between a nation’s universally declared stand in the international arena on outer space (or any other matter) and its national application. In its spatial context harmonizing treaty obligations with national law demonstrates the continuing resolve of a country to support the imperative need for collective measures to

⁹⁰ Ranjana Kaul, Does India Need National Space Laws?, National Space Legislation: A Blueprint for India, Regional Space Conference on Bringing Space Benefits to the Asia-Pacific Region, Bangalore 27–29 June, 2005 (on file with the author).

⁹¹ Press Release, Dept. of Space, Gov’t of India, National Space Law (Dec. 16, 2015), <http://pib.nic.in/newsite/PrintRelease.aspx?relid=133383> [<https://perma.cc/TK4S-9P4W>].

⁹² *Experts Bat for Space Law*, THE HINDU (July 19, 2015, 2:28 AM), <http://www.thehindu.com/sci-tech/india-needs-space-law-say-experts/article7438953.ece> [<https://perma.cc/GN2U-FFKR>].

⁹³ See Kaul, *supra* note 90.

manage international affairs in such a way as to ensure that outer space does not become yet another battleground for nations.⁹⁴

In a similar vein, V.S. Mani holds that the effectuation of international obligations through domestic laws help promote community aspirations regarding space otherwise remaining dormant in policy documents—only a “well thought out space law would go hand in hand with a well thought out space policy.”⁹⁵ He calls for a domestic implementation of space treaties through the enabling provisions of the Constitution of India.

The imaginations of national space legislation for India are thus caught between the binaries of a madness for modernity and fixation with the classicism of international law, leaving hardly any consideration for the scientific and indigenous ambitions of the forefathers of the ISP. Whatever little results are available, this concept—when translated to legislation—will forget the ontology and genealogy of the ISP. All efforts have been, perhaps inadvertently, in the direction of decentering the indigeneity—which is the leitmotif and related experiences and practices of the ISP—evincing “[an] arrogance and ignorance, and a lack of respect and humility in the face of the lessons of accumulated experience.”⁹⁶ Mummery’s caveat is worth heeding at this juncture: “Laws, like people, should be valued for what they have accomplished and for the experience gained, even if it is negative in some respects.”⁹⁷

B. REFRESHING THE WORK: TOWARD NEWER ACTIONS

One question remains unasked by both the modernist and classicist camps in the pursuit for why India, a state that is normatively enlightened and has a legal self-consciousness of the finest order, does not have space legislation. It is certain that India was a compliant state that honored all the international space treaty obligations. India’s approach to these treaty obligations is what George Pavlakos and Joost Pauwelyn call “principled monism.”⁹⁸ That is, India practices not hard legal

⁹⁴ *Id.*

⁹⁵ V.S. Mani, *Space Policy and Law in India and Its Relevance to the Pacific Rim*, 35 J. SPACE L. 615, 631 (2009).

⁹⁶ Mummery, *supra* note 88, at 109.

⁹⁷ *Id.*

⁹⁸ See George Pavlakos & Joost Pauwelyn, *Principled Monism and the Normative Conception of Coercion Under International Law*, in BEYOND THE ESTABLISHED LEGAL ORDERS: POLICY INTERCONNECTIONS BETWEEN THE EU AND THE REST OF THE WORLD (Malcolm Evans & Panos Koutrakos eds., 2011).

structures, but legitimate, malleable policies that honor the ambitions and experiences of the actors in areas the policies sought to regulate. Yet, there was neither any criticism of the justness and fairness of India's space policy, nor any empirical challenge to the treaty breaches by India.

This prompts us to believe that, in regulating space, India was better off with policies within its larger international ethic of principled monism. That policy governance, until recently, was motivated by a sense of philanthropy and communitarianism, free from "technocratic agendas."⁹⁹ The subjective scope of the policies helped India and the ISP rationally self-guide its indigenous ambitions and balance them against the demands of modernity.¹⁰⁰ However, the ISP is often criticized for its modesty of self-containment in policies, which is also a cause for the mad rush toward national space legislation. But little such criticisms are informed by the fact that such modesty is not because of any normative constraints on India, but because of a cost-based rational choice of the state in the policy-spaces for the fulfillment of the state's sociopolitical and ideological ambitions.¹⁰¹

Even in the 1990s and 2000s, India's space policy, as generally believed, was not overturned by the massive wave of liberalization. Rather, by establishing a commercial wing called the ANTRIX Corporation, which maintained the ISP's "organic linkage to ensure a high level of contribution and commitment to customers' programmes," the ISP optimized the indigenous potential of Indian space science.¹⁰² Indeed, ANTRIX did not reinvent the indigenous science of the ISP. Rather, it adopted the strategic position of market bilateralism to sell the data India collected and processed through its indigenously built satellites.¹⁰³ Even during times of crisis in the global market, ANTRIX was maxed out by strategic adaptations. Gopinath reports that the best use of internal indigenous capabilities as against the alternative, popular strategy of "farming out" helped ANTRIX safe-

⁹⁹ See Rajeswari Rajagoplan, *The Growing Case for an Indian Space Policy*, BROOKINGS (May 27, 2015), <http://www.brookings.edu/research/The-Growing-Case-for-an-Indian-Space-Policy/> [<https://perma.cc/BJ8Z-PJ6A>].

¹⁰⁰ See *id.*

¹⁰¹ See Mukund Kadursrinivas Rao et al., *Future Indian Space: Renewing Policy Dimensions*, COORDINATES (Jan. 2015), <http://mycoordinates.org/future-indian-space-renewing-policy-dimensions/> [<https://perma.cc/Y7BE-KW8V>].

¹⁰² See C. Gopinath & L. Surendra, *Antrix Corporation Limited: A Strategy for the Global Market*, 28 CASE RESEARCH J. 1, 2 (2008) (internal quotations omitted).

¹⁰³ *Id.* at 7.

guard the ISP's goal of self-sufficiency.¹⁰⁴ In fact, it is the hermeneutic and dialectic scope of policy frameworks that enabled ANTRIX to sustain effectually in the market.

If that is the case, why does India need national space legislation at all? It is possible that the need is just an innocent and ill-informed demand for hard norms under a paradigm that falsely assumes that “law is authoritative and capable of changing outcomes irrespective of pre-existing conditions . . . legal institutions once in place will be used in a bottom-up process of social ordering where, in principle, everyone can mobilize the law to further their ends.”¹⁰⁵ Most of the demands for national space legislation are fueled by an optimism that in ensuring better participation in the global market, “domestic legislation can regulate more intensively and extensively than can the space law treaties.”¹⁰⁶

However, the demand for a national space legislation is based on two misconceptions. First is that *international space law continues to have a normative relevance for states, and hence any effectuation of those norms through domestic enactments would make the states better off*. In fact, the historicity in which the said norm formation happened has increasingly been under criticism—S.G. Sreejith and Yugank Goyal ask, does international space law’s “splendidly normative architecture carry any more significance than an artifact of [Cold War] diplomacy?”¹⁰⁷ It does, but not as norms of a normative legal system, but instead as a strategic information of a non-normative character that would help states make rational choices.¹⁰⁸

The second misconception is that *domestic legislation is a tool for market access and market integration*. Theoretically, this is in fact the case—a domestic legislation that is in harmony with international market standards can guarantee trade liberalization and public regulation.¹⁰⁹ However, a less thought-out national space legislation that merely harmonizes to ensure market access is likely to restrict the state’s pursuit of its domestic preferences.

¹⁰⁴ *Id.* at 12.

¹⁰⁵ Katharina Pistor et al., *Social Norms, Rule of Law, and Gender Reality: An Essay on the Limits of the Dominant Rule of Law Paradigm*, in GLOBAL PERSPECTIVES ON THE RULE OF LAW 241, 254 (James J. Heckman et al. eds., 2010).

¹⁰⁶ FRANCIS LYALL & PAUL B. LARSEN, *SPACE LAW: A TREATISE* 37 (2009).

¹⁰⁷ S.G. Sreejith & Yugank Goyal, *Institutional Cost of Space Law*, 41 J. SPACE L. 57, 60 (2017).

¹⁰⁸ *Id.*

¹⁰⁹ Armin von Bogdandy, *Law and Politics in the WTO: Strategies to Cope with a Deficient Relationship*, 5 MAX PLANCK Y.B. U.N. L. 609, 634–35 (2001).

Further, it would disregard the national and cultural specialties of its space program.

This article does not argue that there should not be national space legislation. Rather, it urges lawmakers to make a cost-benefit analysis to determine whether the cost of such legislation outweighs the prevailing policies. A blind adoption of national space legislation, relying on models tested and proven in different sociocultural contexts, would destroy the indigenous science and the nationally-motivated vision of the ISP and its forefathers. Hence, legislation or policy, whatever the cost-benefit analysis would indicate, must have a means to defend the indigeneity of the ISP. This article proposes that the organic nature of the science of the ISP must be the guiding force in moving forward.

C. RESTORING INDIGENOUS GENEALOGY: THE ORGANIC-SCIENCE FORMULA FOR LAWMAKING

Science is what enables the human exploration of outer space. Hence, science will determine the sociopolitical conditions that space exploration has potential to create. However, if science, in its socializing potential, acts out of its caprices in a totalizing manner, as “the-science” does, societies will have to compromise their sociocultural and civilizational specialness. Science will then potentially render societies unutilized in the progressive development of the world. Martin Heidegger critiques the falsity of science’s ways of rationalizing existence, claiming that science is only a “condition posited by the will to will itself, through which the will to will secures the dominance of its essence.”¹¹⁰

However, as argued elsewhere in this article, science, save for its vulnerability to yield to the needs of its possessors, is a gentle and neutral force that can be put to the best constructive use of society. However, for achieving that constructivity, science needs to be accepted in its finest varieties. A framework for such a recognition is put forward by Visvanathan under the rubric “cognitive justice,” which is a framework that “recognises the right of different forms of knowledge to coexist . . . It demands recognition of knowledges, not only as methods but as ways of life.”¹¹¹

¹¹⁰ MARTIN HEIDEGGER, *PATHMARKS* 231 (William McNeill ed., 1998).

¹¹¹ Shiv Visvanathan, *The Search for Cognitive Justice*, SEMINAR 6 (2009), http://www.india-seminar.com/2009/597/597_shiv_visvanathan.htm [https://perma.cc/J59B-JQ6Y].

Cognitive justice is not a framework that needs to be built. It is here, there, and everywhere. It confers a right, and a claim thereof, of cultures to actualize their ontology in epistemologies.¹¹² Visvanathan further explains that cognitive justice is far from a campaign. It is also “not a lazy kind of insistence that every knowledge survives as is, where is.”¹¹³ Rather, it provides a right to debate and dissent within models of dialectic, transcending the “old dichotomies of tradition and modernity, of development and underdevelopment.”¹¹⁴

Considering the indigenous nature of the science of the ISP and the success and individuality it has brought for India, a national space policy or space legislation must first assert the “accumulated experience” of the nation in developing means for exploring outer space.¹¹⁵ It should also have the cognitive justice framework in its design. It should not be polarized (like the Western science) but instead dialectically demonstrate the antinomies in the totalizing approach of the-science, and invite all sciences to dialectically engage with their own universal onto-epistemological self.¹¹⁶ As Visvanathan succinctly states, “We need ‘thought experiments’ that disturb both worlds and allow both the self and other to confront each other in a kaleidoscope of new experiences.”¹¹⁷

However, a blind adherence to indignity and ignorance of the increasingly globalizing world would be a temporal mistake. True, indignity of the science distinguishes the ISP from the totalization of the-science, but it can also provide a comparative advantage in the global market. That is not to subscribe to the view that India should assimilate to global competition (and its ethics). Instead, imagine the possibility of the indigenous rediscovering itself in the international institutions and processes. Anthony B.L. Cheung shares a similar optimism by asserting that, in a globalizing world, “Indigenous values and projects count more than simply emulating some external [capitalist] models, even as the process of policy learning and diffusion

¹¹² *Id.*

¹¹³ *Id.*

¹¹⁴ *Id.*

¹¹⁵ Maria Paula Meneses, *Subjects or Objects of Knowledge? International Consultancy and the Production of Knowledge*, in *COGNITIVE JUSTICE IN A GLOBAL WORLD* 353, 359 (Boaventura de Sousa Santos ed., 2007).

¹¹⁶ *See id.* at 357–59 (discussing the futility of clinging to a classical dialectic).

¹¹⁷ Visvanathan, *supra* note 111; *see generally* S.G. Sreejith, *An Auto-Critique of TWAIL’s Historical Fallacy: Sketching an Alternative Manifesto*, 38 *THIRD WORLD Q.* 1511 (2017) (discussing the concept of the alternative dialectic).

takes place.”¹¹⁸ National policy and legislation can help contextualize the interplay (the dialectic) of indigeneity and the global forces of the indigenous sciences and the-science. Legislation and policy could also create the opportunity for the indigenous and the global self to engage with each other.

Finally, any future legislation must not become overtaken by globalist forces that deviate from thoughtfulness. They also must not self-betray by falling prey to the holism global discourses often attributed to global phenomena. However, as stated earlier, India’s effort at space legislation has fallen prey to a technological holism (a variety of global-holism paradigm) where some are advocating for a legislation modeled on the existing space legislations of a few states.

In overcoming such misguidedness, any effort at national space legislation needs a proper theoretical approach to protect the organic science that provided indigeneity to the ISP. Perhaps a fine theoretical point of departure that can best guide the case of the indigeneity of the ISP is to critically view the process of the protogonization of technological holism as an erroneous modernist approach to an *assemblage* of science and society.¹¹⁹ In the assemblage, science and society are far more interwoven (than in a holistic framework) in a rhizomatic existence—“science itself can incorporate all forms of knowledges and objects drawn from society and vice versa.”¹²⁰ In modernity, science as many other social assemblages is simply “fluid” and “dissipated,” free from any iron-casted interconnectedness of contexts that generally enable science to totalize other cosmologies and epistemologies. Hence, Alan Irwin and Mike Michael assert that “the assemblage of science and society can be deterritorialized—existing relations can be scrambled so that novel relations emerge.”¹²¹ Further, Julie Allan explains the scope of deterritorialization: “Deterritorialization seeks to knock existing understandings and ways of acting into a different orbit or trajectory. Its purpose is to undo the ‘processes of continuous con-

¹¹⁸ Anthony B.L. Cheung, *The Politics of International Policy Learning in Public Administration: Limits of Interdependence and Convergence under Globalization*, in *SOUND GOVERNANCE: POLICY AND ADMINISTRATIVE INNOVATIONS* 57, 61 (Ali Farazmand ed., 2004).

¹¹⁹ Assemblage has the same conceptual value as Deleuze and Guattari have attributed to it. See generally GILLES DELEUZE & FÉLIX GUATTARI, *A THOUSAND PLATEAUS: CAPITALISM AND SCHIZOPHRENIA* (2004).

¹²⁰ ALAN IRWIN & MIKE MICHAEL, *SCIENCE, SOCIAL THEORY AND PUBLIC KNOWLEDGE* 120 (2003).

¹²¹ *Id.*

trol and instantaneous communication.’ It is a performative breaking of existing codes which is also a ‘making.’”¹²²

This type of a problematization of the modernist intertwining of science and society should help in deterritorializing the holism of science that has brought indigenous science of the ISP under the totalizing snare of the-science. Legislation and policy should be seen as “opportunities to interrupt” the advancing discursivities of the-science on the colonized epistemic territories.¹²³ Interruption is possible through dissenting imagination, which may or not be within a legislation. However, Allan, based on a certain Scottish experience, cautions that legislation has the risk of creating “rigid striations” which can constrain imagination by creating normatively stronger boundaries and territories.¹²⁴

India needs a finer and more rational imagination on the inclusion of its indigeneity in the policy, and in legislation if required. While there has been some policy effort for such an inclusion on the part of the ISRO and the government of India, all efforts at national space legislation miss on that front. Legislative effort thus far has been directed toward territorializing the domination of the-science through the above holistic approach, which is at the cost of the exclusion of the indigeneity of the ISP. The proposed deterritorialization, by whatever means, should emphasize the historically proven experience of the bygone subjects. Their experience includes technologizing science in its organic, indigenous form and the success they obtained thereof. The dialectical might of indigenous science should disturb territories colonized by “the-science” to create what James Joyce calls a “chaosmos,” which is a vantage point to explore the performative possibilities of a deterritorialized and refined imagination.

VII. CONCLUSION

This article explores the debate surrounding the need for national space legislation in India. What prompted such an inquiry, however, was the concern that the national space legislation project overlooks the indigeneity of the science of the ISP, a science that is ontologically closer and more meaning-

¹²² JULIE ALLAN, *RETHINKING INCLUSIVE EDUCATION: THE PHILOSOPHERS OF DIFFERENCE IN PRACTICE* 62, 63 (5th ed. 2008) (citations omitted).

¹²³ *Id.* at 63.

¹²⁴ *Id.*

ful to the actual existence of humanity in the world, unlike “the-science” which totalizes certain vested interests. Moreover, the science of the ISP is cherished, and helped the nation’s coming-to-consciousness, achieving national self-sufficiency and prestige. That science is fairly different from the aggressive space science that is employed globally for power-gains. It also is vastly different from the big science of international space law through which states flaunt their power to each other.

This article has built a framework to examine the nature of Western science, which this article entitles “the-science.” It examined the following: 1) the extent of the-science in human space exploration; 2) the catechistic approach of international space law to social issues, which is a false piety to human concerns; 3) the proletarian ambition of the men of the ISP; and 4) the falsity in the approach, particularly of the academia, toward the making a national space legislation in India. In that process, the article has achieved the following:

First, the article captured the discursive transformation of Western science from being merely a science to becoming “the-science.” In its totalizing potential, Western science has destroyed the essentialist particularities of other knowledges, rendering them epistemic outcasts.

Second, the article has verified that the type of science that both enables human space exploration and underlies the law regulating the use and exploration of outer space is none other than “the-science.” Hence, under the totalizing snare of “the-science,” human space exploration, which ought to have been advancing human wellbeing, has become a tool of amorality.

Third, the article has constructed an Indian narrative on the use and exploration of outer space. That narrative opens up the possibility for reconstruction by providing an otherness to the epistemological singularity and a segmentarity forged by “the-science.” The alterity of the Indian narrative is particularly constructive for it is untouched by ontologies that is alien to the Indian indigenous self.

Fourth, the article analyzed the concept of national space legislation for India and the work associated with it. The analysis finds that the demand for national space legislation is primarily an artifact of academia in order to have a paradigm to debate about the normative strength of space law. Further, the article favored policy for effectively governing the exploration and use of outer space, yet it did not discredit legislation. Rather, it submitted a theoretical framework to explode falsities, if any, in the

imagination of national space legislation and to effectually rationalize efforts in that direction.

VIII. MID-PUBLICATION AUTHOR UPDATE

On November 21, 2017, India's Department of Space, released the Draft Space Activities Bill, 2017 (Draft Bill), opening it up for comments from the stakeholders and the public. The Draft Bill is largely modeled on the "Model Law on National Space Legislation" (Model Law) formulated by the International Law Association. The main objective of the Model Law is to "serve as an instrument of harmonizing and developing space law."¹²⁵ Even as India subscribes to the Model Law, which aims at worldwide harmonization of space activities, the Draft Bill recognizes the uniqueness of the ISP and the activities thereof. In pursuance to this, as the Explanatory Note attached to the Draft Bill states, "necessary customization" was done of the Draft Bill to "match with the Indian context."

However, there is modesty in terms of customizing the Draft Bill to the Indian context. First, the Draft Bill expressed the need to create enabling conditions to further the uniqueness of the ISP. Then, in furtherance to this ambition, the Draft Bill reaffirmed the constitutional powers of the Central Government under Article 73 of the Constitution of India.¹²⁶ This is the customization that the Draft Bill takes pride in. In fact, this is just a case of a principal legislation enabling the Central Government to create a regulatory mechanism for governing space activities. Even in the absence of legislation, by virtue of Article 73, the Central Government can exercise executive powers, which are elaborated in Chapter III (Space Activities Regulatory Mechanism) of the Draft Bill. Certainly, Article 73 and the powers of the Central Government arising from it can be debated. However, if we keep apart the constitutional discourses on the limitations and possibilities of Article 73, but for the delegation of

¹²⁵ There are also critical discourses on the inclusiveness of the Model Law. See, e.g., Sandeepa Bhat & Arthad Kurlekar, *A Discourse on the Remodeling of ILA Model Law on National Space Legislation*, 41 J. SPACE L. 1 (2017).

¹²⁶ Article 73 (1) Subject to the provisions of this Constitution, the executive power of the Union shall extend—

- (a) to the matters with respect to which Parliament has power to make laws; and
- (b) to the exercise of such rights, authority and jurisdiction as are exercisable by the Government of India by virtue of any treaty or agreement.

space governance to the Central Government, what does the Draft Bill aim to achieve? And, even without the Draft Bill, has not what the Draft Bill aims to achieve—the Central Government governance—been in fact the case? One space columnist writes that the Draft Bill has little room “to alleviate what is bothering India’s private space players.”¹²⁷ It advances nothing.

Either way, empowering the Central Government to establish a space governance (framework) is reassuring from the perspective of protecting the ontology of the ISP. This is for two reasons. First, it gives substantial imaginative space for the Central Government to overcome the risk of falling into the grids of the Model Law and any efforts at harmonization thereof, creating scope for “domestic scientific experiences” and “domestic preferences” to continue to guide India’s space pursuits. Similar practices have been followed to a certain extent by the Central Government through the Department of Space including experiments in institutionalization (e.g., ANTRIX and its “optimizing approach” to the indigeneity of the ISP). Second, it helps create the dialectic possibilities by pitting India’s scientific indigeneity against global space technology. The possibilities here range from the Central Government creating scope for general exceptions to National Treatment given to ingeniously developed technology, all the way to “licensed production” of technology.

Available reports from the stakeholders do not necessarily affirm the adoption of the Draft Bill as it is. Stakeholder concerns largely revolve around the general-ness of the Draft Bill and its limited utility for private players. As a result, few shareholder comments address the desire to protect the identity of the ISP. At this juncture, India should create a critical space for further dialogue and debate on the possible legislation. If reconsideration happens, there must be restraint from falling prey to the more ill informed legislation campaigns. Of the many things it may include, the possible legislation must include the memory of India’s scientific experiences and the ontology of ISP.

¹²⁷ Narayan Prasad, *Why You Should Care about India’s New Private Sector Space Activities Bill?*, THE WIRE (Nov. 29, 2017).