

**A Theory of Knowledge and Inequality:
Gender, Caste and Global Inequality**

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WP 01/2025

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2025

Published by:

INSTITUTE FOR HUMAN DEVELOPMENT

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E-mail: mail@ihdindia.org

Website: www.ihdindia.org

ISBN: 978-81-88315-91-8

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Abstract

In this paper, we identify two features of knowledge economies that can make knowledge a factor in social inequality. These are: (1) the enclosure of some knowledge and the resultant distinction between enclosed or monopolized knowledge and knowledge in the commons; and (2) higher returns for those who create and/or own monopolized knowledge compared to those who use knowledge in the commons. These elements of the knowledge system, working in conjunction with other socio-economic factors, are applied to different types of inequality - gender inequality among indigenous peoples, ritual inequality in the ancient Indian Hindu caste system, and contemporary global economic inequality. Some policy-relevant ways of tackling knowledge inequality are discussed, as also the possibility of extending this approach to areas of inequality in socio-economic formations not analyzed here.

Keywords: Knowledge, Enclosure, Monopolization, Social Valuation, Economic Inequality, Gender Inequality, Global Inequality

A Theory of Knowledge and Inequality: Gender, Caste and Global Inequality¹

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INTRODUCTION

Many economists writing on inequality have mentioned that the spread of knowledge is a factor in equality. Thomas Piketty held that the spread of knowledge is “the key to overall productivity growth as well as the reduction of inequality both within and between countries” (Piketty 2013, 20), and even the “principal force for convergence” (Piketty 2013, 22). On the other hand, knowledge can be seen as a key structural factor in the creation of inequality, usually in globalisation (Tyson and Spence 2017, 171) and, more specifically, in the context of the contemporary global organisation of production (Durand and Milberg 2019; Kaplinsky 2019; Nathan 2024) and in global monopsony capitalism (Kumar 2020, Nathan 2020, Nathan et al. 2022).

This paper explores the processes of exclusion through which the enclosure of knowledge becomes a factor—even a key factor—in producing inequality. The key exclusionary process is the formation of a monopoly in the use of knowledge through the creation of barriers to entry buttressed by sanctions. This monopoly can be used to generate and capture higher returns, such as esteem or economic rents or excess income over that from non-enclosed or non-monopolised knowledge in the commons.

There are two questions related to the analysis of knowledge and inequality. First, how is the enclosure or monopolization of some knowledge carried out? Second, why and how is this enclosure of knowledge related to inequality? The first

question has been substantially analysed in a few works. To name a few – Boldrin and Levine (2008), Boyle (2003). These analyses, however, deal entirely with the modern or capitalist system of intellectual property rights. The intellectual property rights literature does not link this to earlier forms of enclosure, such as among indigenous peoples (Kelly 2015). This paper does make such a connection to show that the enclosure of critical knowledge has a long history and geography before and beyond capitalism.

The second question, how enclosure of knowledge can lead to different forms of inequality, as far as we know, virtually has not been raised in the literature. There are discussions of the impact of knowledge enclosure in restricting development, as in Chang (2000) and other economic literature on the need for infant industry protection. However, this discussion has not been extended to the domain of inequality, which is the focus of this paper. Inequality is implied but not explicitly made the outcome to be analyzed in Chang. Schumpeter (1950), of course, analysed the process of formation of monopolies and this has been later extended to the analysis of intellectual monopoly capitalism in global value chains (Durand and Milberg 2019). But neither of these works, nor others that deal with monopoly deal with the other side of producers who use non-monopolized knowledge or knowledge in the commons.

We must emphasize that dealing with only one side of the inequality relation (e.g. of the South in the case of Chang or the North in the case of Durand and Milberg) cannot serve the function of being an analysis of inequality. It is necessary to deal with both sides of the inequality relationship. Richard Florida does mention that inequality increased in centres of “creative capitalism” (2003: 3). Again, there is not an analysis of inequality between “creative” and supposedly “non-creative centres”, or between the supposed creative and non-creative classes. If any analysis that does deal with two sides of the inequality equation it is that of the meritocracy (e.g. Sandel 2020), which is an analysis of capitalist economy. Of course, we have learnt from all the above analyses of the socio-economic features of knowledge.

What is it about knowledge that can lead to inequality? It is exclusion of some social category, whether gender, caste, class or nation, from high-valued knowledge and the confinement of those excluded social categories to low-valued knowledge in the commons. We develop a theory of knowledge enclosure and inequality across different socio-economic formations and history, drawing on earlier works, such as Kelkar and Nathan (2020) and other anthropological literature (Kelly 2015) on

the superior status of ritual specialists among indigenous peoples, its extension to gender relations among indigenous peoples, the Indian Hindu caste system in Nathan, Kelkar and Govindnathan (2022), and the analysis of global inequality in Nathan (2023) and Nathan (2024).

After discussing the nature of knowledge, we describe the process of exclusion which results in the enclosure of knowledge, the social division of labor based on this enclosure and the differential valuation of monopolized and commoditized knowledge. In creating social and/or economic inequality, knowledge and its enclosure interact with factors in the social and economic system, including gender-based division (or non-division) of care work and development policy. We look at how these various factors interact in creating social and economic inequality. After setting out this theory, it is applied to cases of gender inequality among indigenous peoples, inequality in the Indian Hindu caste system, and finally, in the global economy. A theory of inequality also needs to say something about how to reduce, if not eliminate, inequality. We conclude the paper with a few thoughts on ways of moving towards equality.

BASIS OF INEQUALITY: EXCLUSION FROM KNOWLEDGE AS META-RESOURCE

Knowledge is the ability to process information to create a theoretical or practical understanding of a subject to solve problems. Knowledge also requires the ability to mentally anticipate the necessary actions (Renn and Hyman 2012: 20). Knowledge is produced, acquired, used, and learned in a knowledge economy (e.g. Machlup 1973, Renn, 2020). Every society has a knowledge economy with forms of creation, acquisition, transmission and learning of knowledge. For instance, in non-literate societies, learning would largely be through the young working with adults, usually boys with men and girls with women. In capitalist economies, however, formal education is a key part of acquiring knowledge. To the concept of the knowledge economy, we add the feature of the enclosure or monopolization of knowledge.

In economic analysis, knowledge is usually taken to be what Simon Kuznets called “useful knowledge” (Kuznets 1965, 85–7), and regarded as the base of economic development. In this sense, useful knowledge would be technological knowledge or knowledge that can be used in production.

Charles Tilly (2005, 114) points out that control over various value-producing resources can be utilized to create inequality: coercive means, labor, domesticated

animals, land, institutions, machines, financial capital, information, media, and scientific-technical knowledge. Of the 10 resources in his list, knowledge occurs last. But knowledge is not just another resource. In a sense, knowledge can be called the meta-resource, or second-order resource, that is used to create technology for the use of resources. It is the meta-resource that enables the use of resources. For example, the crude oil under the Arabian desert was not a resource until the development of knowledge about using petroleum as fuel and the creation of the appropriate technology for converting this fuel to energy—in particular, internal combustion engines. Knowledge is what turns things into resources. Therefore, it is on another level of existence compared to other resources.

There is not much about which we would agree with Manu, the law-giver of the caste system in ancient Hindu India; except that Manu does identify knowledge as the factor deserving of the highest respect. *Manusmriti* lists in *ascending order* for respect, “Wealth, kinship, age, actions, and fifth, learning are the basis for respect” (Manu, nd, 2000, 2, 136). Learning is the acquisition of knowledge; so, learning as the basis for respect really means that knowledge is the basis of respect.

We will try to give an economic meaning to knowledge as a meta-resource. Production is a function of the means of production, capital and labor with a multiplicative factor that is knowledge. “That a technological relation between inputs and outputs is an embodiment of knowledge may seem obvious,” (Arrow 2000: 16). This technological relation is the effectiveness or productivity of the productive system with capital and labor and it depends on the knowledge that is embodied in their usage. A change in the knowledge base, as in the shift from manual to mechanized production, would change the effectiveness or productivity of the means of production. This is a simple way of demonstrating the meaning of knowledge as a meta-resource - it is that which establishes the effectiveness of the means of production, an effectiveness which changes with knowledge-based innovation.

While identifying knowledge as a meta-resource, it is also necessary to go beyond the notion of knowledge being only technical knowledge or some form of knowledge directly usable in economic production. Spiritual and religious knowledge also count as knowledge in many situations. Part of what we identify as spiritual knowledge, such as the chants or various rituals of indigenous peoples, are also ways of memorising and transmitting practical knowledge in oral, small-scale societies, as seen in much anthropological literature and well-summarised in Lynne Kelly (2015).

Therefore, it is necessary to have a broader definition of knowledge—something that includes not only technological knowledge, but also ritual, spiritual, and religious knowledge, as also psychological and sexual knowledge. These, too, can be the subject of exclusionary processes of enclosure and the creation of inequality. There may also be interactions among different kinds of knowledge, both in their creation and use. Propositional and prescriptive knowledge interact with each other; as do production and ritual knowledge. But in this interaction both types of knowledge may not have the same status. For instance, ritual knowledge in indigenous societies may be considered superior to production knowledge, while in capitalist economies it may be the other way around.

However, knowledge by itself does not result in inequality. This happens only under certain socio-economic conditions in which access to knowledge is restricted, or certain persons and entities are excluded from its use. We have identified two factors that are needed for knowledge to result in social inequality: (1) the enclosure or privatization of some knowledge and the resultant distinction between enclosed or monopolized knowledge and knowledge in the commons, along with a mechanism for penalizing those who transgress the enclosures of monopolized knowledge; and (2) the establishment of a social division of labor based on those who possess enclosed or commoditized knowledge and even different domains of monopolized knowledge, accompanied by the differential social valuation of these different types of work. This differential social valuation may not be just in the form of economic returns but also include status Weber ([1918] 1968), whether as prestige (Veblen [1899] 1994) or stigma (Therborn 2013). These two factors, enclosure and differential evaluation, are necessary for restrictions in access to knowledge to result in inequality and are discussed in some detail below.

ENCLOSURE OF KNOWLEDGE

Knowledge is essentially non-rivalrous (Romer 1990) or non-subtractable (Ostrom, Gardner and Walker 1994), as its use or consumption by any one person does not reduce the amount of knowledge available to any other person. As a public good, it should be a factor for equality. In that case, how does it also become a factor that creates inequality? It happens because of the other characteristic of knowledge—it is excludable—which means that people can be excluded from accessing or using a particular kind of knowledge. This excludability can turn a public good into a private good.

A private good again can be of two types. First is that of individual ownership of the resource. The second is that of what is called a club good, where access is restricted to those persons or entities who are members of the club. The club could be a caste, as in the Hindu caste system; it could be a ‘race’ as in apartheid. But in these cases, too the club good is private and restricted to its members. In this paper we deal with both types of private goods, both of the usually individual or of the club variety.

Exclusion then is the process that results in the enclosure or monopolization of knowledge. There have been many processes of exclusion, from simple secrecy to the contemporary strong intellectual property rights under the World Trade Organization (WTO) regime. Systems of activity that are mainly composed of explicit knowledge, such as in the case of reciting rituals or operating a machine, depend on secrecy (Forsyth 2016 for secrecy or *pidik* in Papua New Guinea, and Kelly, 2015, for the Hopi indigenous Americans) or the difficulty of learning when the routines are complex or long-winded, as in the case of *bobolixan* women priests in Sabah, Malaysia who had to perform rites in exact sequence over many days (Kelkar and Nathan 2020). On the other hand, routines that depend mainly on implicit knowledge, such as in design, are difficult to imbibe and may require long periods of apprenticeship to be acquired, for instance, what is called the “Indian apprenticeship” through which England learned the intricacies of cotton textile production (Riello 2009) before mechanizing it.

Exclusion is not a simple yes-no binary. As Goran Therborn points out, “As an explanatory mechanism, exclusion had better be seen as a variable, rather than as a category, as a set of hurdles being placed in front of some people, a set which includes hindrances, ‘glass ceilings’, discrimination of various sorts, as well as closed gates,” (Therborn 2013: 59). If exclusion is a variable then the resulting enclosure should also be of varying hardness, from the soft exclusion of requiring learning to the harder enclosure of international intellectual property rights under the WTO.

Why would the enclosure of knowledge be carried out? If enclosed knowledge yielded the same return as unenclosed knowledge or knowledge in the commons, there would be no reason to bear the expense of enclosure. In some way, enclosed knowledge must yield a higher return or be more valuable than knowledge in the commons. Thus, a crucial element in a theory of knowledge and inequality is that there is a distinction in terms of the returns they yield between enclosed or monopolized knowledge and knowledge in the commons.

Schumpeter (1950) saw this as requiring monopoly firms that could set prices higher than costs, including ‘normal’ profits, and thus securing a higher rate of profit. This, however, does not show how the monopoly is established. Further, it is based on an economic structure based on generalized markets. Teese (1986) with the concept of *appropriability* showed what was needed to secure higher returns through the intellectual property rights system – the ability to appropriate higher returns. Further, appropriability has the advantage of not being a market-based concept. Appropriation can take place even in a subsistence economy, feudal or caste-based society. In addition, appropriation need not be just pecuniary or even of a non-monetary economic type. It can be appropriation of honour, esteem or respect (Weber [1918] 1968).

PROTECTING ENCLOSURES

Enclosures can be of different levels of hardness. A primary distinction is between enclosures that are legal and those which are social norms. Laws may be more difficult to breach, and thus make the enclosure harder, than norms which are not legal but nevertheless carry a certain social force. At the same time, even when laws of exclusion are changed, there can still be exclusion through social sanctions applied to breaches of norms.

To be effective, enclosures must have penalties if they are breached. Among some indigenous peoples in India, women who try to or are suspected to be trying to acquire prohibited knowledge about clan and household spirits and rites are denounced as witches and even killed (Kelkar and Nathan 2020). In the contemporary global capitalist economy, breaches of the laws of intellectual property can be taken to the WTO’s dispute resolution mechanism.

These are laws that punish the breach of enclosures. The same enclosure, however, can change from being legal to becoming a norm such that, though it does not anymore have the force of law, it could still be exclusionary. For instance, in the Hindu caste system breaching the enclosure of knowledge of the Vedas was awarded high punishment by the law-giver, Manu: “... anyone who acquires the Veda without permission from someone who is reciting it is a thief of the Veda and goes to hell” (Doniger and Smith 2000: 2, 116). Now, however, there is no such sanctified punishment, and the prohibition has changed from having been a law to becoming a norm; contemporary attempts to protect those ancient boundaries rely on methods of harassment, such as boycotts or discrimination.

Students from the Dalit castes (former untouchable castes) have complained about continuing caste-based harassment by peers and faculty. A PhD. student, Rohith Vemula, who committed suicide, poignantly expressed his frustration that “his birth [as a Dalit] was the fatal accident.” “Never was a man treated as a mind. As a glorious thing made of stardust. In every field, in streets, in fields, in streets, in politics, and in dying and living.” (Times of India January 19, 2016). Dalits and other students who secured admission through the Indian policy of reservation are disproportionately represented among suicides in India’s prestigious Indian Institutes of Technology (IITs). In February 2023, when a Dalit student at IIT, Bombay, committed suicide, his parents revealed that he had complained of social boycott by his peers, when they came to know of his Dalit status. This social boycott (<https://thewire.in/caste/iit-bombay-darshan-solanki-suicide>) must be understood as a means of enforcing a norm to inhibit those from the lower castes in India from studying STEM subjects and acquiring the currently high-valued knowledge.

We can also see this transformation from law to norm in the case of women in science in Europe. In *A World Without Women* (1992), David Noble attributes the exclusion of women from European science to the Christian clerical culture of male monasticism from which women were excluded. He claims that European science, “has not simply excluded women, it has been defined in defiance of women and in their absence” (quoted in Green 1992, 829). Even when the university began to be established in the twelfth century CE, “it was an absolute ‘world without women,’ an enclave of masculinity as exclusive as any military organization” (Green 1992, 829).

In the twentieth century, however, with the growth of co-educational institutions, laws had been transformed into norms—an example being the norm that women do not study STEM (science, technology, engineering, mathematics) subjects. Norms are more easily broken than laws, though such transgressions can also have consequences. For instance, women in the 1950s or 1960s in the USA taking these subjects could be regarded as “wierdos” (Noble 1992) and subject to various forms of social ostracism.

DIFFERENTIAL SOCIAL VALUATION

For knowledge to become a basis of inequality, there must be a knowledge-based social division of labor. A social division of labor including a gender division of labor, is one with persons involved in various occupations and together forming a society (Durkheim 1997). This contrasts with the Smithian division of labor within a factory, which is a technical division of labor. Without such a social division of

labor, we would not have a situation in which some people only possessed enclosed knowledge while others only possessed knowledge in the commons. Or, where distinct sets of people carried out allocated occupations utilizing different portions of monopolized knowledge, as in the Hindu caste system. If both or all types of knowledge were equally distributed, then differentiated knowledge would not result in inequality. For inequality to arise, there must be a knowledge-based social division of labor, where people belonging to specific classes, castes or genders possessed all of, or only enclosed knowledge while others possessed only knowledge in the commons.

While we are used to a pervasive social and gender division of labor based on the different kinds of knowledge possessed, it should be noted that this may not have always been the case. In Old (i.e. pre-Hellenic) Europe, the archaeologist Marija Gimbutas, notes that "... the types of artefacts found in male and female graves are not subject to a strict division of labor. In some cemeteries, the same types of artefacts – quern stones, axes, chisels, or copper and shell jewellery – appear in both types of graves" (Gimbutas 1999, 114). Therefore, there were societies that did not have a clear social, in this case, gender-based division of labor.

When there is a clear knowledge-based social division of labor, we move into societies where the social valuation of the different areas of knowledge possessed translates into related economic or social differences. We get what Tilly (2005) called pervasive inequalities, which are inequalities that get recreated by the knowledge-based social division of labor that provide different returns, which become the income or other returns of different social groups.

The social valuation of knowledge could vary from one socioeconomic formation to another. In a capitalist economy, there is a relatively straightforward social differentiation of knowledge based on what income it secures in the market. For instance, in this economy, women's occupation of care work, including that of birth, when it is not marketed, does not even enter the system of national accounts. This devaluation of women's knowledge is exaggerated in the Hindu caste system, where the knowledge of the caste of midwives, called Dhanuk in North India, is considered ritually unclean, putting it at the bottom of the caste ladder. In colonial and even post-colonial states, indigenous people's knowledge of forest management is often rejected as being knowledge and is sought to be replaced by so-called scientific forest management.

The valuation of different areas of knowledge is somewhat different in non-capitalist economies. For instance, ritual knowledge is held to be superior to mundane, production knowledge among both indigenous societies and the Hindu caste system. It is believed that without the correct rituals the crop, for instance, would not be bountiful. Ritual knowledge is then akin to a luxury good “whose principal role is rhetorical and social” (Appadurai, 2013: 20) and gives it a higher status. As elaborated by Simon Harrison in the contrast between ritual and technical actions “ritual is to action, as rhetoric is to discourse, as luxuries are to goods” (Harrison, 1992: 237). Consequently, ritual is taken as superior to technical action. It follows that ritual knowledge has a higher valuation than production knowledge. This turns the monopolized knowledge of ritual into a source of differential returns as compared to the widespread knowledge of production that is in the commons.

Differential social valuation then leads to differential returns. The extent of these differential returns could vary across various socio-economic formations, ranging from differences in prestige with minimal material differences to the ability of capitalist monopolies to carry out cost-plus pricing, yielding what might be called rent or surplus profit. However, the extent of economic inequality in a society would be restricted by the extent of surplus production. Economies with production quantities that are around subsistence production, such as hunter-gatherer bands, could not have much economic inequality without risking the reproduction of the band itself (Milanovic, Lindert, Williamson 2011), while, in contemporary platform-based hyper enterprises, such as Amazon or Facebook, there could be a “winner takes all” (Giridharidas 2019) power distribution of profits leading to extreme inequality.

While we have dealt with the social division of knowledge and valuation separately, they are, in a sense, simultaneous. The division of knowledge is both the presupposition and a result of its differential valuation. In addition, the social division of knowledge also forms different epistemic or knowledge communities. In sum, these form the social division of labour, where the differential valuation of the different types of tasks creates inequality. This inequality can be between genders or between castes and ‘races’. It could also be between parts of the global capitalist economy where there is a specialization in tasks with different productivity or returns in the global economy.

DIFFERENTIAL VALUATION WITH COMPLEMENTARY BUT HIERARCHICAL MONOPOLIES

So far, we have dealt with a situation where there is a binary differentiation, between enclosed knowledge and knowledge in the commons. But there can be a situation of a number of knowledge monopolies interacting with each other in a socio-economic system. There can be a socio-economic system composed of distinct occupations, such as peasants, artisans, traders, nobility and rulers. Each occupation may be quite distinct, though there may or may not be movement from one to another. In any case, the different monopolies may not have the same social valuation and, thus, complementarity would be accompanied by an inequality of valuations, giving rise to a hierarchy in social valuation. A particular occupation and, thus the knowledge on which it is based, may be valued as higher than that of another, e.g. that of nobility may be higher than that of peasants or artisans, or of the priest higher than all others. This differential social valuation would then lead to inequality. In the case of multiple social groups there could then be a hierarchy of social valuations.

An extreme form of inequality is formed where the knowledge of a particular social group, including women, is not acknowledged as knowledge at all. For instance, in the traditional Hindu caste system, women's knowledge of birthing practices was not considered knowledge at all. Birthing knowledge seems to be considered as of the same order as natural practices. Such prejudice against women's practical knowledge not being knowledge at all was also seen in France in 1423 when the Faculty of Medicine of Paris decided that "...what women did in the process of assisting each other in birth was not considered medicine" (Green 2008: 323). We can replace 'medicine' with 'medical knowledge' and we get the denial of women's practical knowledge as being part of knowledge.

With the possibility of complementary knowledge monopolies, we move away from the binary distinction between knowledge that is enclosed and knowledge in the commons. We now have a number of knowledge monopolies with differing social valuations, leading to inequality. This can also result in hierarchy, with higher valued knowledge resulting in high status and lowvalued knowledge resulting in low status.

High-valued knowledge could result in high status, a form of super-ordination. Simultaneously, however, there is also something that is often disregarded – lowvalued knowledge and low status are also a form of subordination. If there is honour in high status there is also stigma in exclusion from high-valued knowledge. "Stigmatization is a marker of exclusion, bestowing those on those outside never-

healing cultural wounds” (Therborn 2013: 59). Orientalism (Said 1978) is a form of stigmatization meant to demonstrate that the colonial excluded were inherently inferior for whom colonization was a liberation from primordial backwardness. This stigmatization can take the form of untouchability, where, as in the Hindu caste system, the very body of those performing low-valued tasks (e.g. manual scavenging or birth assistance) is stigmatized. In racism, too, there is a stigmatization of the tasks carried out by the subordinated. What needs to be emphasized here is that stigmatization of tasks carried out by the subordinated or subalterns, also means a stigmatization of the knowledge involved in those tasks, as of manual scavenging by the Hindu untouchables, or of care work by women.

CATEGORICAL INEQUALITY AND ADVERSE SPECIALIZATION

Thus, exclusion from forms of high-valued knowledge creates not just a form of category difference, but because of differential valuation, categorical inequality. The differential returns and the recreation of boundaries turn the category difference into a durable inequality (Tilly 2005: 22). The category inequality is recreated by exclusion resulting in specialization. Specialization is a neutral word that seems to imply an equality between the two sides in the specialization. When Ricardo formulated the famous doctrine of comparative advantage, he drew the policy implication that England should specialize in manufacturing and Portugal in agriculture. This was supposed to be of benefit to both countries. This static analysis, however, neglected the dynamic or development effects of the specialization. England’s specialization \productivity, the increasing returns activity through learning by doing (Arrow 1962) or the development of technological capabilities (Lall 1992). Portugal, on the other hand, would remain in what the classical economists always characterized as an activity with decreasing returns. Because specialization in high-yield and low-yield knowledge results in sustained differences in returns, it is better termed adverse specialization as in the analysis of global inequality from the 1800s onwards in Nathan (2024).⁴ Such adverse specialization is further self-perpetuating until changed by deliberate social or economic development policy.

4 The authors had an interesting personal encounter with adverse specialization. When their daughter was young, Dev suggested to Govind, with the usual reasoning of an economist, that since she knew more about looking after children, she should take the main responsibility of caring for her. Govind replied that her knowledge of care work was not something she was born with and that, as she had learned care work, Dev could do the same. In a family matter, this discussion brought out the nature of learning and specialization as something learned and not inherent in a person. After this discussion, Pallavi and Govind will testify that Dev did learn care work and, in fact, took up the main responsibility of childcare.

STATUS

Economists are prone to looking at just the economic returns from exclusion from high-valued knowledge. Schumpeter's analysis was clearly one of high profits from monopolization. In a capitalist economy where money is the measure of everything, it is quite 'natural' for high economic returns to be the motive for knowledge monopolization. Even in a capitalist economy, as Veblen ([1899]1994) argued a long time ago, there is the search for status, whether through conspicuous consumption or other forms of differentiation. But when we bring non-capitalist societies into the discussion of inequality, it is necessary to go beyond material inequality. Following Weber ([1918] 1968), the basis of inequality is not just control over resources (knowledge in our analysis) but also power and status. Status or power would become micro-motivations for creating inequality and, in turn, create a macro-structure (Ridgeway 2014) based on status differences.

The importance of status as a motive and basis for inequality is seen in indigenous societies, largely involved in subsistence economies with forms of redistribution of surpluses. Knowledge of ritual requirements is compensated in some form of limited increased consumption, but, in any case, it is not something that can be accumulated and lead to sustained economic difference. But what does accrue with a ritual specialization is higher status, which may be due to honor, respect, or esteem (Weber [1918] 1968). Once created, however, the status becomes an independent mechanism for creating inequality (Ridgeway 2014: 2). We will see below how this works when we take up the interaction of knowledge with other bases of inequality, such as other resources, power, and status.

INTERACTION OF KNOWLEDGE WITH (OTHER) RESOURCES, POWER AND STATUS

It is necessary to study the way knowledge and other bases of inequality, including other resources, political power and status, interact in the creation of inequality. There is a two-way relationship in this interaction. For instance, knowledge can be used to establish political power. And, once established, political power can be used to determine what constitutes or does not constitute knowledge. This is a very brief statement of a complex issue, but it is clearly something that must be part of any research program on knowledge and inequality. However, it is the hypothesis of this paper that, in this interaction, knowledge is the primary factor in creating inequality, though not the only factor.

Above we have argued that knowledge is distinct from other resources control of which can be used to create inequality. Knowledge is the meta resource that enables the use of other resources. We now take up the interaction of knowledge with another basis of inequality, power. Knowledge is not used just in production or rituals. It can also be used to seize political power, as shown in the analysis of the ‘military revolution’ (Parker 1988) in establishing colonialism and carrying out gunboat diplomacy. This was based on the superior naval military knowledge of putting cannon, later rockets, on ships of European navies compared to Asian empires, especially those of India and China. Hilaire Belloc, a supporter of colonialism, wrote in the context of the European-African encounter, “Whatever happens, we have got the Maxim, And they have not” (Belloc 1898). The Maxim was a machine gun. As one of the authors pointed out in an email exchange with Gerry Rodgers, the enclosure of superior military knowledge was the basis of gunboat diplomacy, even in the period of establishing colonialism before the Industrial Revolution.

High-valued forms of knowledge create high status, such as that of Brahmins in Hindu India or of mandarins in Confucian China. But, once created, this status, whether of esteem and respect or stigmatization, could itself interact with knowledge to re-create inequality or, under conditions of radical change, create new forms of status. To take the latter, the French Revolution paved the way for a new meritocracy based not on inherited status but on acquired knowledge. However, this meritocracy, using its educational and intellectual resources was able to create a largely self-perpetuating meritocracy (Sandel 2020). In India, with the transformation of the legal system where high-valued knowledge was no longer the legal preserve of any caste, the upper castes were able to transform their former caste resources into new forms of intellectual and educational resources to stall the entry of the lower castes into the meritocracy (Subramaniam 2019). This was also achieved through the denigration of the untouchable, stigmatized castes as lacking merit.

INTERACTION OF KNOWLEDGE ACQUISITION WITH OTHER SOCIO-ECONOMIC PROCESSES

However, knowledge does not work by itself alone or just in conjunction with other bases of inequality, but also in conjunction with other social, economic, gender, and political factors. To take an example of the interaction of knowledge inequality with gender relations, we saw that women have been discouraged from studying science, technology, engineering and mathematics or STEM subjects, which provide

some of the highest returns in the market. However, even when they do manage to study and seek professional lives in these areas, as is often the case around the world today, they are frequently held back by already existing gender expectations of childcare and other household care work in realizing their potential.

A study of Indian women professionals in the IT industry found that they were often unable to avail of promotions because they involved inter-city transfers (Kelkar et al. 2012), but the women needed to stay where their children went to school. In Claudia Goldin's analysis of gender earning differences in the USA, "When earnings are linear with respect to time worked the gender gap is low, when there is nonlinearity, the gap is higher," (2014, 1103). Where earnings are linear with respect to the amount of working time, women can combine childcare with flexible working hours; in the case of non-linear earnings, however, flexible work times lead to a loss of earnings per hour. However, in both cases, women with child-care responsibilities would be working fewer hours, leading to a loss of total earnings, if not earnings per hour. This is also likely to affect the household bargaining power of women, as per Amartya Sen's (1987) theory of household bargaining power based on relative and fallback earnings.

In both cases, however, it is the responsibility for care work that leads to gender differences, whether in promotion or earnings. Therefore, despite the current ability of women to acquire knowledge in STEM subjects, the gendered distribution of care responsibilities could restrict their use of the acquired knowledge, making a difference between acquisition and use of knowledge. Women's responsibilities in terms of care work would weaken their bargaining positions in the employment market and enable monopsony employers to discriminate in terms of earnings. At an analytical level, these examples show that it is necessary to combine the analysis of production and social reproduction in order to understand the gendered nature of inclusion and rewards.

Another factor that can come into play is that of discrimination against specific social groups. As seen in studies in the USA and India (Deshpande 2014) women, African-Americans (in the USA), or women and Dalits with similar knowledge, as indicated by qualifications and experience, are more discriminated against than men, White Americans or upper-caste Indians in being offered chances of employment.

What this indicates is that ours is not a mono-causal theory. The argument is not that knowledge is the only cause of inequality. It is an important cause, but, as we saw, the acquisition of knowledge and the overcoming of knowledge inequality

can itself be overwhelmed by factors such as the gender division of labor in care work or discrimination to create economic inequality.

We can now illustrate how the elements of the knowledge economy—the distinction between monopolized knowledge and knowledge in the commons, the ways in which enclosure or monopolization are carried out, the exclusion of some from the monopolized forms of knowledge, and the differential social valuation and, thus, returns to forms of knowledge—interact with other socio-economic factors to create inequality. We will take up this analysis of both intra-country and inter-country inequality.

GENDER INEQUALITY AMONG INDIGENOUS PEOPLES

Among many indigenous peoples in India and elsewhere, ritual knowledge is held to be superior to technological knowledge or the knowledge of production. Sometimes, as demonstrated through the earlier-quoted example about Amazonian myths (Bamberger 1974, 276) this knowledge was initially created by women who came up with the concept of the sacred lodges, trumpets, and masks, but these were subsequently captured by men, who then excluded women from that knowledge. This monopolized knowledge became a source of power as it was valued more highly than technological knowledge. “The ethnographic evidence is consistent across a range of non-literate societies: oral specialists in small-scale cultures maintain power through the control of knowledge” (Kelly 2015, 24).

The exclusion of women from ritual knowledge is policed by ritual witch-hunts of women who are denounced for trying to secure prohibited knowledge, or even for aspiring to positions of leadership within these societies. For instance, women among the Warli tribe in Eastern India risk such denunciation if they even try to listen to these rituals (Munshi 2001). Among central Indian indigenous peoples, such as the Munda and Santhal, women run the risk of being persecuted as witches if they are suspected of trying to secure sacred and prohibited knowledge, such as the names of clan spirits (Kelkar and Nathan 2020).

However, ritual specialists’ social superiority does not translate into substantial economic returns. With the low productivity of these indigenous peoples, there are limits to the extent of inequality that can be maintained without the existence of these societies being threatened (Milanovic, Lindert and Williams 2011, 52). Consequently, inequality among indigenous peoples is mainly one of higher esteem and respect for ritual specialists.

THE HINDU CASTE SYSTEM

In the Hindu caste system, a caste is defined by the task it is exclusively permitted to carry out. Consequently, there is a strict social division of labor in the original formulation of the rules of caste society, as in the *Manusmriti*. Of course, this division of labor has become a little less strict, with some tasks such as agriculture being carried out by many of the middle castes and, over time, even by upper-caste people.

The form of exclusion is then no longer a matter of law, as it was in ancient India. The exclusion has become one of norms. However, as the leader of the anti-caste movement in India in the middle of the 20th century pointed out, “This Dharma [code of conduct] of Manu, by reason of the governing force which it has had for centuries, has become an integral and vital part of the customs and traditions of the Hindus... As law, it controlled the actions of the Hindus. Though now a custom, it does not do less. It molds the character and determines the outlook of generation after generation” (Ambedkar, Vol. 5: 284-285, quoted in Jaiswal 2016, vi).

According to the Hindu code, Manu gave learning or knowledge the highest respect. However, not all knowledge was considered to be equal. Knowledge of the Vedas, the preserve of Brahmins or the priestly caste, was given the highest respect, since the Brahmin was said to have been “born of the highest part of the body [the mouth]” (Manu 1, 93). Kshatriyas, the warriors; Vaisyas, traders and artisans; and Sudras, service castes, followed in that order. The untouchables were initially not included in the caste system, but are the fifth caste, now referred to as Dalits or the downtrodden. They were despised and carried out the essential tasks of cleaning and scavenging. Hence, the knowledge of the various castes was socially ranked, simultaneously providing the basis of a ritual-based social ranking.

Women were given a status matching that of the caste to which their family belonged, but, as discussed in detail in Nathan, Kelkar, and Govindnathan (2022) they were almost invariably excluded from the core knowledge of the caste, including that of knowing the Vedas, the valued knowledge of the the Brahmin priests. The only knowledge they had in common was that of care work. However, as mentioned earlier, this knowledge was not listed as knowledge —instead, it was assumed to be of the same order as natural tasks. We can say that care work was performed using knowledge in the commons.

High ritual inequality does not necessarily mean high economic and political ranking. But a person of high ritual rank would retain that rank even if he were lower

down, say, in economic terms. At the same time, castes could also use economic or political power to push for a higher ritual ranking, leading to a manner of group, though not individual social mobility, as pointed out for eighteenth-century India in M.N. Srinivas (1952), and Veena Das (1968), to refer to just two of those analyzing this social mobility. But in these cases, the claim for higher status is based on a mythical genealogy of having originally been of higher status and then having been forced to adopt a style of life or occupation of lower castes. More recently, Dipankar Gupta (2020) from an analysis of numerous origin genealogies points out that they all invariably point to an origin of higher caste status, Brahmin or Kshatriya, and their subsequent confinement to a lower-caste status. The intersection of ritual knowledge status with other forms of inequality, political and economic, allowed for limited mobility in ritual status.

GLOBAL INEQUALITY

We now turn to the role of knowledge in creating inequality in the global economy, analysed in detail in Nathan (2023 and 2024). The first period is that of colonialism, from about 1800 to 1950; and the second period that of decolonization from 1950 to the current times. For both periods we use the terms Global South and Global North to designate two broad segments of the global economy, comprising low- and middle-income and high-income countries respectively.

The period of colonialism is that of the Great Divergence (Pomeranz 2000) when per capita incomes in the Global South, taking India and China as prime examples, declined from 50% and 44% of those in Western Europe in 1820 to just about 7% and 10% respectively in 1950. Comparative per capita incomes in Africa and Latin America also declined from 35% and 58% in 1820 to 34% and 40% in 1950 (Nayyar 2013 and 2019).

This Great Divergence was brought about by the forced adverse specialization, of the South in production of agricultural and other raw materials, using knowledge in the commons, and of the North in manufacturing with increasing returns to scale and using high-value knowledge enclosed through exclusion. The monopsony relations of limited buyers in the North with myriad suppliers in the South, led to a decline in the relative terms of trade of the South in international trade as noted in the Prebisch-Singer analysis.

A combination of knowledge monopoly through intellectual property rights, and development policy, resulted in Kicking Away the Ladder (Chang 2002), or, the

prevention of the South from developing manufacturing. This led to a divergence of growth rates of just above 1% per annum for Britain and France, as against around 0.25% or even nil for China and India (Maddison 2006: Table 2.22b). Over more than a hundred and fifty years, this adverse specialization in monopolized and commoditized knowledge resulted in the Great Divergence in per capita incomes between North and South.

To look at enclosed and commoditized knowledge (knowledge in the commons) in the current post-colonial period, we analyse the nature of Global Value Chains (GVCs). GVCs are a form of contractual manufacture of goods and services, with clear (though hierarchical) divisions of labor within the chains and between participating countries based on a division of knowledge. Headquarter firms, located largely in the global North or headquarter economies, carry out pre- and post-production tasks, such as design, branding and marketing; while supplier firms based largely in the global South or supplier economies, carry out manufacturing. Knowledge of the pre- and post-production tasks are monopolized by intellectual property rights (IPRs) forming intellectual monopolies (Durand and Milberg 2019, Kaplinsky 2019). Knowledge of manufacturing, on the other hand, is largely in the commons or uses commoditized knowledge. The headquarters firms that are monopolies also have degrees of monopsony power to push down the prices of inputs, using competition among suppliers from the South. Wages in labor-intensive tasks are also kept below living wages and forms of gender-based sexual harassment used as methods of supervision of work on the shopfloor.

What we see in GVCs is a clear division of knowledge into monopolized knowledge protected by intellectual property rights owned by headquarter firms in the global North and commoditized knowledge or knowledge in the commons of manufacture with supplier firms in the global South. There is more than one way in which the resulting inequality is manifested. One way, is through gross profit margins which are around 50 to 60 per cent for headquarter firms, and around 10 per cent or less for supplier firms in the global South. Another, is through shares of value captured in different segments. From the iPhone, Apple captured 58.5% of value, Chinese assemblers 1.8%, non-Chinese labor in component manufacture 3.5%, these other suppliers 14.3%, with raw materials accounting for 21.9% (Chan, Pun and Selden, 2016).

The third way is through comparative labor productivity which would correspond with per capita income. Table 1 below shows labor productivity in China and India

as a percentage of that in the USA in some GVC products in 1995 and 2015. These differences in per capita productivity, when added up over sectors of the economy, would be reflected in inequality in national per capita income.

Table 1
Per capita real output in China and India as % of USA, 1995 and 2015

	<i>China</i>		<i>India</i>	
	<i>1995</i>	<i>2015</i>	<i>1995</i>	<i>2015</i>
Garments	4.5	84.2	14.7	29.7
Shoes	5.0	46.5	16.8	14.0
Automobiles	3.9	14.9	1.7	4.8
Electronics	7.3	41.1	12.4	63.2
Pharmaceuticals	3.6	21.7	11.8	4.9
IT Services	53.8	20.0	25.6	52.2

Source: Nathan et al 2024.

In China in 1995 in all manufacturing sectors per capita real output or labor productivity was only in single digits compared to that in the USA. By 2015, China had substantially reduced the gap; but India remained well behind the USA in 1995 and 2015 too.

As argued in Nathan (2023 and 2024) the unequal distribution of gains in GVCs and unequal labor productivity are mirrored in the inequality of per capita incomes in the global economy. Headquarter firms dominate in high-income economies; suppliers (including of raw materials) dominate in low-income economies; while middle-income economies contain both suppliers, including those of full package suppliers, along with a few headquarter firms. Thus, the division of knowledge becomes a division of labor in the global economy, resulting in a hierarchy of profit rates and labor productivity across high-, middle-, and low-income economies.

DEALING WITH KNOWLEDGE INEQUALITY

Since we identify knowledge inequality, the difference between returns monopolized knowledge and knowledge in the commons, as a key factor in creating social and economic inequality, can this be modified by policy? We will take this up in two contexts – that of gender inequality in the workforce and of global inequality.

In the case of gender inequality, it was noted that although women may have acquired required knowledge in the STEM subjects, their ability to use that knowledge is inhibited by their childcare responsibilities. Claudia Goldin points to

the role of childcare in affecting women's ability to fully participate in the work force and consequently seeking flexible work times (2014). For her, the solution is to make all work similarly flexible, so that women's childcare responsibilities do not reduce their hourly earnings. However, even if women's hourly earnings do not go down, their total earnings would decrease with a reduction in the number of hours worked. In addition, those seeking such flexible work hours are likely to be disadvantaged in securing a promotion, as also pointed out by Marianne Bertrand (2021).

A better solution could lie in finding different ways of managing childcare. This could be through a combination of sharing between the couple and the family, as well as state-provided childcare. The importance of non-familial childcare is brought out in the analysis of Theresa Neef and Anne-Sophie Robillard (2021). They point out that, in Costa Rica, Spain or Brazil, due to the existence of a high level of inequality in the women's labor force, highly paid women can utilize the hired services of low-wage women to support their own professional lives. This is certainly also the situation in India. However, in Scandinavian countries, publicly provided childcare seems to play a major role, along with socially accepted practices of sharing childcare, in supporting professional work by women.

What this means is that in addition to supporting the entry of women and other disadvantaged social groups into STEM subjects, attention needs to be paid to factors like providing child care as public services and norms that promote sharing of childcare within the household, that can help such people develop their capabilities in utilizing this knowledge. Furthermore, attention needs to be drawn to the systemic misogynistic or casteist behaviour of peers in trying to preserve gender or caste-based monopolies.

CRITICAL TECHNOLOGICAL KNOWLEDGE AS COMMON PROPERTY

The usual justification for intellectual property rights is that the ability to earn monopoly profits serves as an incentive for the production of new technological knowledge. Such a formulation places the private firm as the main or even the only agent in the creation of new knowledge. Contrary to this view is that of technological knowledge as the collective creation of a host of actors, both public and private, in the innovation system (Mazzucato 2011). As an example, she points out that key technologies in the iPhone smartphone system were actually created in the public sector—the Internet, GPS, the touchscreen display, and the voice-activated personal assistant, Siri. What Steve Jobs and Apple did was to bundle

it all together with an IPR-protected operating system and make an innovative commercial product.

Therefore, the development of technological knowledge is “*collective*, characterised by a system of public and private actors, interacting in different ways” (Mazzucato 2017, 102—emphasis in original). One should note that in his rejection of the “just deserts” merit-based distribution of rewards, John Rawls had argued that natural talent itself is a “common asset” (1971, 102) and therefore, it was necessary to share the benefits of talent-based distribution of income. Arrow (1994) pointed that knowledge creation has an irremediably social component. Nevertheless, there is a need for incentives, whether for individuals or collectives, such as firms. “Indeed, the practice of rewarding good (or right) deeds cannot but be an integral part of any well-functioning society,” (Sen, 2004: 9).

If the development of technological knowledge is collective, then there is a good case for arguing that the resulting knowledge should remain collective or in the commons. At the very least, it can be argued that critical knowledge of the general-purpose technology of an era, such as IT today, should be allowed to spread as fast as possible. Similarly, for critical health and climate change technologies. A system of compulsory licensing (Kingston 2001) would both provide rewards for creation of knowledge, including covering costs of production,, compensating for risks, while allowing its spread. What such a step would do, though, is to moderate, if not eliminate, monopolies based on intellectual property rights.

Would this work on a global scale to reduce global inequality? As pointed out in this study, much of the technological knowledge is tacit, making it difficult to imitate. There is a need for an appropriate knowledge development path. However, a beginning can be made in making technological knowledge available for areas, such as in climate change technology and pharmaceuticals for dealing with communicable diseases, that are clearly acknowledged as global public goods. After much struggle, the governments of the global North and Big Pharma firms were forced to accept Indian generic production of AIDS drugs in the WTO’s Doha Declaration to counter the AIDS epidemic. However, this has not happened in the case of the current COVID-19 pandemic, nor in the case of climate change and health. However, a political coalition needs to be built for bringing in such changes in international patent regimes that would allow the global spread through compulsory licensing of new critical technologies for dealing with health pandemics and climate change.

CONCLUSION

The two critical concepts in this analysis are those of enclosure or monopolization of knowledge and the differential valuation of varied domains of knowledge. We have seen in this paper that these two concepts can be applied to various types of socio-economic formations – non-literate, economies with minimal surplus production; the ascriptive Indian Hindu caste system; and the contemporary global capitalist economy, including both within-country gender inequality and inter-country global inequality. Can these concepts be used to analyze socio-economic formations other than those dealt in this paper? We would expect that this approach to knowledge and inequality could be applied to other societies, such as Confucian China or feudal Europe.

Further, in this analysis, there is no pre-determination of what is or what is not knowledge. In particular, there is no attempt to utilize formulations from one economy to look at another. Spiritual knowledge can be valued above production knowledge in one economy and provide just esteem or respect, while profit is the only measure of differential valuation in the capitalist case. There is no presumption that these values or norms are the same everywhere. Thus, both enclosure or monopolization of knowledge and differential social valuation can be understood on the norms and values of the particular socio-economic formation being studied.

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