The Code of Pangolins

Interspecies Ethics in the Face of SARS-CoV-2

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More than two decades ago, Lévi-Strauss argued that bovine spongiform encephalopathy was the result of forced cannibalism among cattle. He pointed out that not only the consumption of cattle organs by cattle but also the eating of beef by humans is a kind of cannibalism among animals. His argument highlighted the negative aspects of connection and assimilation in the act of eating. Today, several anthropological responses have been evoked to address the social, (bio)political, and economic problems caused by the novel coronavirus SARS-CoV-2. Although this article is part of that wider corpus, it focuses not on the novel aspects of the phenomenon but on relatively familiar aspects using "classic" anthropological ideas such as substance code, dividual personhood, and taboo. By comparing the circulation of viruses within and beyond species boundaries with the circulation of substance codes observed in South Asian societies, I point out the imaginariness not of dividual personhood but of our existence as individuals. These examinations raise the significance of the anthropological understanding of people's practices regarding boundary making and unmaking between the human and the wild to consider the problem of zoonoses originating from wild animals.

Everyday Cannibalism

On a beautiful day in Kyoto in the late spring of 2020, I walked to my office on the university campus. Though it was a weekday, there was hardly anybody on campus. It was the period when all classes were conducted online, and we spent strange days like a long vacation. Soon after I reached my office, two graduate students majoring in anthropology visited me, and we talked about the influence of COVID-19 on our research and daily lives. When it came to talk of animals that may transfer coronaviruses to humans, I mentioned the pangolin, which was then being reported as a probable natural reservoir of SARS-CoV–like coronaviruses.

"Pangolin!" On hearing its name, both students broke into laughter, and I was caught up in it in spite of myself. Why did we laugh? Although the media reported the pangolin as an unfamiliar and strange creature to most Japanese, it was a popular animal among anthropologists. Even the image of the animal that was reflected in our minds at that time might have been the same. It was likely that the laughter emerged from the gap through which "that pangolin," a familiar and even "classical" animal for us, suddenly came into the spotlight in the unexpected context of the spread of novel viruses.

One of the students told me that when her grandmother saw a picture of the animal on a TV news program about COVID-19, she rolled her eyes and said, "Well, really! Those people eat anything." Listening to this story, we all sighed and became silent. We knew that the problem was neither simple nor remote, even though her grandmother's opinion might be held by most people. It was not simply the problem of the "strangeness" of pangolins and those who eat them but rather of humankind—all of us. Poor pangolins! How, then, can we anthropologists, who have learned about—and feel sympathy with—pangolins, consider and describe the issue of zoonosis? This is the starting point of this short article.

More than two decades ago, Lévi-Strauss (2000 [1996]) argued that bovine spongiform encephalopathy (BSE) was the result of forced cannibalism among cattle. The animals contracted the disease by being fed fodder mixed with the bones and organs of dead cattle. Humans who ate beef from the affected cattle also contracted a disease that endangered their lives. Lévi-Strauss pointed out that it is not only the consumption of cattle organs by cattle but also the eating of beef by humans that is a kind of cannibalism among animals.[1] His words highlighted the negative aspects of connection and assimilation in the act of eating: through an inextricable relationship of eat or be eaten, we relate with and ingest others, which can result in our being critically affected.

1. Here, Lévi-Strauss extended the notion of cannibalism to the absorption of other creatures' substances into the self, including the acts of eating animals by humans. Referring to Lévi-Strauss's (2016) arguments on BSE and cannibalism, Keck (2018) argued that cannibalism for Lévi-Strauss was "only the limit of a gradient of identifications of the self to the other, from communication to sociability, predation, and incorporation" (35). Although Keck's arguments correspond to this article's points in many aspects, I think that defining oneself by one's capacity to assimilate (or not assimilate) the other, which Keck (2018:36) ascribed to the characteristic of humanity, is rather a fundamental feature of relations between the self and the other for every organism at various levels (see Gilbert and Tauber 2016).

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Although we may not call it cannibalism, we always live in such a dangerous connection with others, assimilating them. While my "self" is formed by absorbing various substances, the substances released from me contain particles of my self. Thus, my self is composed of various others and is also spread over innumerable others. Substances that are both self and others flow and circulate among various social and ecological milieus or *umwelten*. Eating, touching, caring, sharing, and even breathing—through these everyday acts and practices, particles of self and others, including nonhumans, are transferred, absorbed, released, spread, and circulated.

In South Asian societies, anthropologists have analyzed the permeable and discursive ways of being a person. They discuss what is believed to be contained in various things such as food and water, blood and semen, and gifts and offerings and refer to their transfer from person to person as "substance code." This notion indicates the impartibility of physical substance and intangible code, which directs one's way of being as well as the relationship between people and their social and ecological milieus. Such a way of being a person, where one is formed and transformed by absorbing others' substance codes while diffusing into relationships by releasing one's particles, has been named "dividual" personhood, in contrast with the "individual" of the modern West.[2]

Since substance codes circulate through various interactions, such as eating, sexual relations, parentage, and gift exchanges between humans, as well as between humans and nonhumans, it has been an important problem for people to determine how they promote or limit those circulations—and to what extent.[3] Hence, studies of South Asian societies have often focused on the formation and dynamism of transactional networks through which substance codes circulate and how their circulation performatively creates and recreates boundaries among actors (see Ishii 2015*a*, 2015*b*).

Viruses as "Coded Substances"?

Viruses, which typically consist of nucleic acids (RNA or DNA genomes) surrounded by a virus-coded protein coat called the capsid, have the function of mediating horizontal gene transfer among different species of the same generation. Contrary to the vertical transmission of genomes from parent to offspring, horizontal gene transfer is the transmission of genetic information from one host to another through viruses that transit between hosts (see Gelderblom 1996; Nakayashiki 2016).

Because viruses are substances containing coded information that transit horizontally among different hosts, it may be possible to call them literal biological substance codes. Of course, such a biological substance code is not the same as the substance code observed by anthropologists. In anthropological studies exploring this issue, code refers to appropriate ways of conducting and being rather than coded information. Thus, it connotes notions such as law, morality, social order, and relationship. Meanwhile, the codes contained in viruses are inherently neither social nor ethical.

At the same time, the circulation of biological substance codes, including viruses, can be socialized. For instance, attempting to trace the infection routes of a virus implies tracing and clarifying the relationship between hosts through which the virus is distributed. The relationships branch from one to another, extend, and disseminate. This simply shows that microscopic particles of my self as a host spread into the social network through contact with others, while particles of numerous others mix into my self unknowingly. As mentioned above, previous studies of substance codes and personhood have often described permeable and dividual persons in non-Western societies in contrast to the impermeable and autonomous person in the modern West (e.g., Smith 2006:74). Here, we realize that it is not a permeable and discursive dividual person but rather an indivisible individual with definite boundaries that is a figment of a particular cultural imagination.

Controlling Circulation

Anthropologists who have conducted fieldwork in South Asian societies have reported various rules and practices that local people have created to protect themselves from dangers arising from incautious contacts and transactions with others (e.g., Copeman 2011; Laidlaw 2000; Marriott 1976; Raheja 1988). For instance, one should not have contact with, eat with, or use the same dish as others who are possibly dangerous; one should maintain an appropriate distance from them and delineate a boundary. Contact with the other contains a latent danger, and risk lurks in the exchange of substance codes. The ways of avoiding or negating such relationships have some similarities across different times and places.

A nucleic acid with a virus-coded protein coat is a biological substance code that is neither human nor inherently social. Nevertheless, ways of controlling its circulation and exchange once it has been transmitted and spread through a social network have been developed, similar to those for the substance codes found by anthropologists. Moreover, sophisticated technologies are now being used for this purpose. For instance, governments and companies are trying to estimate the areas in which coronavirus clusters occur by analyzing data such as geolocations and the search histories of smartphone

2. On the notions of substance code and the dividual person, see Daniel (1984), Marriott (1976), and Marriott and Inden (1977). See also Carsten (2011), Ishii (2019:82–85), and Strathern (1988) for the development of these notions in anthropological studies. The insights of these studies regarding substance and dividual personhood correspond to those of recent biological and medical anthropological studies focusing on the complex composition of the self as including various others, such as microbes (e.g., Gilbert, Sapp, and Tauber 2012; Gilbert and Tauber 2016; see also Fuentes 2019; Lorimer 2018).

3. Concerning this point, Marriott (1976:110, 113) describes particles of substance codes as constantly in circulation, just as power, which is present in various objects such as persons, gods, and land, flows everywhere.

users, tracking the paths of those infected by using smartphone and integrated circuit card data, and introducing Bluetooth-based mobile apps that record the contacts of users and notify people who come close to those infected (see Daskal 2020). These techniques are enabled by smart, convenient information networks that we rarely notice in our daily lives. The infrastructure of information networks is used for tracking and controlling the circulation of viruses as biological substance codes, and new technologies have been developed to complement existing ones. What are being exposed here, at least partially, are our traces and particles and the ways our selves mix and spread, which are ironically called "private information." We have never been individuals, in any case.

Meanwhile, irrespective of these attempts by humans, viruses circulate between persons and organisms living in diverse umwelten. Such circulation is possible because, even though each of us is a different being, "we" still have commonness, to an extent that enables substance transactions between our bodies. In addition, what enables the rapid circulation and wide diffusion of viruses is nothing less than the global social network created by humans. Therefore, for us to understand the entanglements of the circulation of biological substance codes and social and (bio)political networks, it is indispensable to carefully examine how viruses circulate beyond humanity and sociality, as well as which networks mediate their circulation and what sociopolitical techniques have been created and implemented to transform the ordinary state of society.

Awe and Taboo

Let us return to Lévi-Strauss's argument regarding BSE. He saw the spread of the disease as a catastrophic result of forced cannibalism among cattle. This view helped us realize that this disease is the result of an unexpected diffusion and mixture of substance codes caused by "unnatural" food chains, including the consumption of cattle by cattle and the consumption of beef from infected cattle by humans. Historically, one of the devices to prevent such dangerous mixtures and control the circulation of substance codes was called "taboo." When a taboo, regarded as natural law, was broken, fatal substance codes overflowed and endangered the one who absorbed them.[4]

As already mentioned, anthropologists who have conducted fieldwork in South Asian societies have noticed that people paid much attention to the dangers of mingling and fusing with others through the exchange of substance codes. In each community, the ways of contacting and transacting with others were carefully organized. Here, others implies not only humans but also nonhumans, including gods, spirits, and animals.

For instance, in a village in Karnataka, South India, where I conducted fieldwork, villagers were most concerned about transactions with deities called *būta*, which included the spirits of wild animals such as tigers and wild boars. The wild force or *śakti* of the deities is considered dangerous for people, but at the same time it embodies fertility, which enables the reproduction of the community and its agriculture. Therefore, in a ritual, the villagers give offerings to the deities embodied within mediums to appease them and receive their śakti and then let them return to the realm of the wild (Ishii 2019). Similarly, the goddess of smallpox, called Māri, is also worshipped in the village. The villagers offer sacrifices to the goddess to appease her fearsome power. The primary patron of the village būta shrine, called the *gaḍipatinārụ*, refers to his intimate relationship with the būtas incarnated within mediums as follows: "Only the gaḍipatinārụ can physically touch the deity—nobody else can do it. Only the gaḍipatinārụ can assuage the deity's thirst. The gaḍipatinārụ has *adikāra* (mutual rights and responsibilities) toward the deity and also the deity has adikāra toward the gaḍipatinārụ. To hand a sword to the deity and receive it from her is the adikāra of the gaḍipatinārụ" (Ishii 2019:53–54).

As this narrative indicates, it is believed that the people (represented by the gaḍipatinārụ) and būtas have adikāra, or mutual rights and responsibilities toward each other. Hence, the avoidance of dangerous others such as būtas and the goddess Māri is not a simple exclusion but rather a technique of controlling and receiving the other's ambivalent power. Just as with controlling water that flows into paddy fields, these rituals are means of coordinating the flow of a dangerous and fertile power and rearranging the boundary between the human and the wild (Ishii 2015*b*, 2017). The boundary is not an absolute one based on a fundamental difference between oneself and others. Rather, it is fragile, based on the potential for mixture and permeations of each other. The villagers know the fragility and flexibility of the boundary; that is why they continuously invest in relationships with others, follow taboos, and restore the boundaries.

Toward the Morality of the Concrete

Lévi-Strauss's argument regarding BSE suggests that the relationship between humans and animals or humans and nature has become disorganized due to excessive human intervention and that the orders and boundaries that controlled the circulation of substance codes are nearing a point of collapse. Currently, the novel coronavirus that threatens human societies is said to have very likely originated from wild animals such as bats. In addition, it has been reported that multiple lineages of coronaviruses that are similar to SARS-CoV-2 have been discovered in Malayan pangolins (*Manis javanica*) smuggled into

4. Referring to Herbert Spencer, William Robertson Smith, Claude Lévi-Strauss, and others, Keck (2018) reviewed the transition of anthropological studies on zoonosis from prevention to precaution to preparedness. He noted that Robertson Smith "uses the Polynesian term taboo to describe precautionary measures applied to forces he qualifies as 'infectious'" (29). Further, Volpato et al. (2020) pointed out the problems that led to zoonosis, such as the commodification of wild animals keeping pace with the decline of local knowledge on nature, and argued for the importance of taboos and social norms to maintain appropriate relationships between humans and natural environments.

southern China. Even though pangolin species are regarded as critically endangered, there is a high demand for these animals as sources of food and ingredients in traditional Chinese medicine. Hence, they are said to be the most illegally trafficked mammals in the world.[5] According to Lam et al. (2020), pangolins are "the only mammals in addition to bats that have been documented to be infected by a SARS-CoV-2 related coronavirus," and these animals may play "an important role in the community ecology of coronaviruses" (285). Hence, they warn that the sale of wild animals, including pangolins, in wet markets entails the risk of promoting contact between humans and animals acting as hosts for these viruses, thus increasing the chances of future zoonotic transmission (Lam et al. 2020).

As with BSE, the question here too is one of distancing and boundary making and unmaking between humans and animals and between the human and the wild. Although each of us is a different being, "we" still have a commonness that enables us to exchange our substance codes with each other. That is why we should have remained aware of our relationship with and kept appropriate distance from certain others to maintain fragile borders.[6] Now, however, without accustomed codes or taboos, we are at a loss about how to deal with potentially dangerous relationships. When one realizes that one's boundary is so fragile that the self as an individual may exist only in imagination, is our only option, then, to fall in line with the smart network of governance and surveillance to defend and strengthen our boundary?

Even so, we cannot but continue to think about how we should live as our permeable and fragile selves with all these surprising and inevitable relationships involving eating, touching, caring, and sharing with others when we have already been living this way.[7] Here, it seems necessary to reconsider ways of stimulating and controlling the circulation of various substance codes—neither as a technology of governance applied to individuals nor as an economy reduced to monetary circulation but rather as the concrete relationships between you and me. Each consists of various substance codes and is possibly nonhuman.[8]

How should I receive your particles, and how should my particles be absorbed into you? How should we relate with, respond to, and keep away from each other? If we call these manners and practical logics codes, they may be synonymous with morality, just as the anthropologists who first presented the notion of substance codes had supposed. Besides, they must be morals not exclusively for humans but for both humans and nonhumans, such as animals and viruses, just like the codes for the South Indian villagers transacting with the spirits of wild animals and the goddess of smallpox.

The Code of Pangolins

Luc de Heusch (1985) wrote about the worship of tree pangolins (*Manis tricuspis*) among the Lele of the Kasai in Zaire (now the Democratic Republic of the Congo). The tree pangolin is a unique mammal with a body covered by scales that lives in trees and bears only one young at a time. The Lele call this animal "chief"; it is linked to water, is the source of fertility, and is believed to have the power to enhance women's productivity.[9]

> The small pangolin is a veritable epitome of the universe. It combines the properties of aquatic, celestial and terrestrial creatures. Monoparous, it is also the symbolic representative of moderated human reproduction in a world where fertility is teeming beyond measure. It is the logical or rather dialectical agent of religious communication. It is through its mediation that the village and forest, man and the spirits, enter into privileged relationships. (de Heusch 1985:29)

Since, to the Lele, the tree pangolin is beyond the ordinary categorization of animals, it can be the object of worship as well as taboo because of its status as a "spirit animal." They are awed by this animal, and they maintain an appropriate distance from

5. On the global consumption and circulation of wild animals, including pangolins, as the background of the spread of zoonoses, see, e.g., Challender and Hywood (2012) and Volpato et al. (2020). It is noteworthy that the channels of introduction of viruses and other agents of zoonoses via wild animals into human networks are socially defined by particular medicinal practices and consumption behaviors. At the same time, it is pointed out that the trade chains of wild animals have become so complex that consumers cannot realize the problems caused by their consumption of these animals (see Wang, Turvey, and Leader-Williams 2020).

6. This, however, never implies the "Orientalist" claim that people living in certain areas are "mixing nature and culture in unacceptable ways" and thus causing problems (Fearnley 2020; Zhan 2005). For most of us, what "nature" and "wild" mean is not self-evident. As several researchers have pointed out, the problem is rather in our desires as well as in our global networks, which invite excessive intervention in nature and stimulate modification of the wild and its circulation and consumption (Keck 2020; see also Smith and Theriault 2020; van Dooren 2014).

7. Although this line of argument relates to studies of habitus and proxemics, I focus here on the uniqueness and contingency of each embodied existence and its relationship with others, rather than their normative aspects. In other words, since our existences and mutual relations are so fragile and contingent, we need to elaborate some codes to direct them. On our ontological frailty, see, e.g., Butler (2004), Ishii (2014), and Turner (2008).

8. In their review on the recent trend in the anthropology of ethics and morality, Mattingly and Throop (2018) point out that phenomenological anthropological approaches to moral experience focus on experience that gives primacy to first- and second-person perspectives. According to them, for a number of contributors to the issue, the ethical entailments of the second-person perspective were drawn from Emmanuel Lévinas's view that "experiencing the other's singularity and unassumability arises through a responsiveness to the plenitude and uniqueness of the other being" (483). This perspective is significant in considering human-nonhuman relationships in terms of ordinary ethics (e.g., Lambek 2010). It also corresponds to the perspective of multispecies studies focusing on affect, care, and responsibility in interspecies relationships (e.g., Haraway 2016; Satsuka 2018).

9. See also Douglas (1954, 1957, 1975).

it by forbidding its hunting. At the same time, they attempt to absorb the animal's fertile power and vitalize the everyday order by eating it only ceremonially, within a ritual. Lele attitudes toward pangolins may give us a clue to reconsider how we should care for intimate nonhuman others while being awed by them and how we should relate to them while keeping away from them.

It may simply be a coincidence that the pangolin is one of the mammals infected by SARS-CoV-2–related coronaviruses and is considered a possible host in the emergence of novel coronaviruses (Lam et al. 2020).[10] However, is it possible that it is the uniqueness of this animal that awes the Lele that has given rise to numerous people's desires, to such an extent that it endangers the animal through mass-scale poaching and secret dealings and enhances the global spread of their potentially fatal particles? This suggests another catastrophic result of the collapse of borders and the overflow of substance codes caused by excessive intervention by humans.

By referring to cannibalism in his argument about BSE, Lévi-Strauss raised the issue of the relationship between humans and animals and between humans and nature. Similarly, the name pangolin seems to be a code, or voiceless caution, that hints to us the taboo we should impose on ourselves and the interspecies ethics we should now create by reminding us of the Lele ways of relating to, caring for, and keeping distance from intimate nonhuman others.

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10. To date, although multiple lineages of pangolin coronaviruses similar to SARS-CoV-2 have been discovered, scientists are still investigating whether pangolin species are really the intermediate hosts of SARS-CoV-2. See Lam et al. (2020), Xiao et al. (2020), and Zhang, Wu, and Zhang (2020).

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