



Evolution of Humanity

English Translation of the Original Essay by Kinji Imanishi. Including Commentaries by Contemporary Scholars

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Abstract

In 1952, Kinji Imanishi wrote a thought-provoking essay on the nature of animal societies. In this essay, he applied the concept of human culture (which he referred to as *Karuchua*) to nonhuman animals by giving different taxa a voice in a fable-like conversation, thereby aptly transcending speciesism. While thoroughly inspiring for scholars who have mastered the Japanese language, the essay was only known to non-Japanese-speakers by its English abstract. Here, we unveil the rest of the essay for the English-speaking community. Furthermore, to contextualize the seminal text, we asked contemporary scholars working in the field of (animal) culture to comment on the essay in a conversational manner akin to the structure of the essay itself. To guide this conversation, we asked the scholars to answer the questions: “What was your first impression of the essay, and how has your own work been influenced, either directly or indirectly, by Dr Imanishi’s work?” and “In what way has Dr Imanishi’s concept of *Karuchua* been encompassed by Western approaches?” What ensued now lies before you. We feel privileged to present to you the first English translation of the original Japanese essay by Kinji Imanishi that has already inspired so many scholars and nonscholars alike in their quest for understanding the nature of social life.

Keywords Culture · *Karuchua* · *Kaluchua* · Group living · Sociality · Instinct · Learning · Social life

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Introduction

In 1952, Kinji Imanishi authored a profoundly thought-provoking essay that examined the intricacies of animal societies. Within this essay, he introduced a pioneering approach by applying the concept of human culture, which he termed *Karuchua*, to nonhuman animals. He accomplished this by granting various taxa a voice in an allegorical dialogue, effectively transcending the boundaries of speciesism. Although a source of deep inspiration for scholars well-versed in the Japanese language, the essay remained concealed from non-Japanese speakers. Today, we are privileged to be able to present the entirety of this essay to the English-speaking community, sourced from the original Japanese essay as it appeared in the 1952 collection “Man,” which was curated and edited by Kinji Imanishi and originally published by Mainichi Shinbunsha at the Mainichi Library. Furthermore, in an effort to provide a comprehensive backdrop for this seminal work, we have invited contemporary scholars specializing in the field of (animal) culture to share their insights in a conversational style mirroring the essay’s own structure. For this conversation between (in alphabetical order) Prof. Pamela Asquith, Prof. William McGrew, Prof. Frans de Waal, Prof. Andrew Whiten, and Prof. Juichi Yamagiwa, please see the Supplementary Information.

English Translation of “Evolution of Humanity” by Kinji Imanishi (1952)

Evolutionist: Soon it will be 100 years since the publication of Darwin’s *On the Origin of Species* (1859). Yet, a number of people are unconvinced that humans evolved from animals. We have been trying very hard to correct this ignorance. Regardless, many scholars in Japan feel the need to declare that humans and animals are different, although no one ever said that they were the same. These scholars may not be denying evolution per se, but in speaking only of this difference, they sound as if they are denying it, making it difficult for their listeners to simply believe that humans did evolve from animals. This is a problem.

Countries, such as the United States, unlike Japan, gives more weight to statements by biologists. Their social scientists also have a strong tendency toward objectivism, arguing that humans should not be treated differently just because they are human, and all subjects of research should be regarded objectively. Accordingly, they clearly state the differences between humans and animals; however, they also clearly state the points in common between the two. They do not pick favorites, obscuring the similarities to insist only on the differences. Thus, no contradiction arises between them and the evolutionist stance that humans evolved from animals and became human.

However, whether pointing out differences or similarities, when the one doing the talking is a human, it is not difficult to imagine the involvement of some kind of bias. An evolutionist preaching the theory of evolution is easy to dismiss, because it is no

different from a priest preaching heaven and hell. Therefore, we have gathered you here today to hear directly from you. We would like to hear you out, and based on your arguments, recognize differences where there are differences and similarities where there are similarities. I will take the liberty to act only as a moderator today.

Instinct and Culture

Evolutionist: Now, I think it would be best to begin our discussion from a matter of common knowledge. How about this? In the world, it is regarded that animals are creatures that live only by instinct, whereas humans have culture (*karuchua*)¹....

Human²: Right, the moment we stopped being animals and became human was when we developed culture (*bunka*).

Evolutionist: Wait a minute. I did not say culture (*bunka*), I said “culture (*karuchua*).” When you say “culture,” you may picture the Order of Culture (*bunka*) award or the modern, westernized style of residence known in Japanese as culture (*bunka*) housing. Playing the piano, going to the cinema, discussing Beethoven, critiquing Hollywood stars...I will not say that these should not be parts of culture (*karuchua*), but the scope of the word culture (*karuchua*) is broader. It does not refer only to these sophisticated pursuits. For example, when you have a bowel movement, you use a toilet; when you are done, you wipe with toilet paper, and you wash your hands. This is culture (*karuchua*) as well. In that sense, culture (*karuchua*) exists everywhere, not only in so-called civilized countries.

¹ Translation note: Here, the use of the term “culture (*karuchua*)” indicates that Imanishi is using a word adopted from the English word “culture,” instead of the Japanese word “*bunka*” (pronunciation), which is the usual Japanese equivalent of culture. Japanese language has three components in the writing system and one of them is a phonogram. By using this phonogram, it is possible, and common, to write an English word by expressing the pronunciation of the word with the Japanese phoneme (“ka-ru-chu-a”). Imanishi’s intention to use the phonogram was to avoid the connotation that the Japanese word (“*bunka*”) had in its usage and to define the word “culture (*karuchua*)” in a specific way in this essay. In this translation, we express these two terms (the phoneme expression of the English word “culture” and the Japanese word meaning “culture”) as “culture (*karuchua*)” and “culture (*bunka*),” respectively, in the three following speeches by Evolutionist, Human, and Evolutionist. However, after the speech by the Evolutionist (which ends with “though their culture (*karuchua*) is obviously different from our own.”), Imanishi continued to only use the term culture (*karuchua*). Therefore, for the sake of readability, we will simply use “culture” from that point in the essay onward. Lastly, we note that the spelling with the letter “l” also has been in use, i.e., “*kaluchua*.” To provide context, Japanese language does not discriminate “r” and “l”—the letter “r” is used for both sounds. Following the standard Hepburn romanization system, “*karuchua*” is the correct way to write the original Japanese word, which is why “*karuchua*” is used in this translation.

² Translation note: In other references to Imanishi’s text, “human” has sometimes been denoted as “layman.” Given that “human” is a more accurate translation of the original Japanese word “*ningen*” and the interpretation that Imanishi lets the respective commentator speak on behalf of the entire species (not just laymen), just like the bee and monkey speak for their animal taxa, we adhere to the translation of “human”.

All humans, no matter how uncivilized, have culture (karuchua), although their culture (karuchua) is obviously different from our own.

Human: If, as you say, everything in our life is culture, wouldn't it be clearer to just call that "lifestyle" because cultural differences are to be understood as lifestyle differences?

Evolutionist: When it comes simply to lifestyle, we can say that even animals have their lifestyles. That is why culture must be, first and foremost, *the lifestyle of humans*. However, how are we to differentiate culture as the lifestyle of humans from the lifestyle of animals?

Human: Human lifestyle consists of behavior that is learned after birth, through observation or teaching. Conversely, animal lifestyle is behavior that is innate, with no need for teaching or learning by observation. This is the fundamental difference between culture as human lifestyle and instinct as animal lifestyle.

Evolutionist: We also could say that instinct is inherited behavior, and culture is non-inherited, acquired behavior. However, because culture is learned through observation or teaching, it requires someone to become a model or to impart the education. In other words, the formation of culture is premised on group living.

In our field, the matter of whether acquired traits can become inherited traits is considered one of the fundamental questions of evolution, albeit still unanswered. The question of whether acquired behavior can become inherited behavior, however, has yet to be raised distinctly. This is due to the tradition of evolutionary theory, which has sought its foundation only in morphology. If you ask us, although morphology and behavior are different matters, the two questions will have to be considered one and the same.

However, even if an animal were to accidentally acquire a behavior that was not displayed by its ancestors, if it lived a solitary life, with no individual to learn by observation or be taught the behavior, then that behavior could not become culture.

In contrast, if it lived in a group, the behavior could be learned by observation and taught, thus becoming culture. However, if its group living were seasonal, like in some species of insects, and all members of the group were to die at some point, as long as that culture had not turned into something inherited, it would disappear with the individuals that learned it. Moreover, if it did turn into something inherited, then it would no longer be culture but instinct.

Therefore, for culture to be preserved as culture, group living must be *continuous group living*. To put it differently, if group living is continuous, there is no need for culture as acquired behavior to turn into instinct as inherited behavior.

Human: If those are the conditions for culture to develop, then culture may be found not only among us humans but also among other animals that, like us, live in continuous groups. What about monkeys?³ Do you have culture?

³ Translation note: While the Japanese language does distinguish between the terms monkey ("saru") and ape ("ruijin-en"), "saru" is the more popular word and can be used to refer to both monkeys and apes. Therefore, in this essay, the "monkey" also is talking about the behavior of "apes," such as chimpanzees.

Monkey: We do engage in continuous group living, and like humans, when we're young, we cannot survive alone without our mothers raising us. Until we clarify how much we learn by observing our mothers or how much they teach us when we're young, there is no telling what in our behavior is culture and what is instinct.

For example, if one of us is separated from their parents as a baby and is raised by humans, and when they grow up, they do not do the things we all do, that might be because they had no one to teach or model the behavior for them. Therefore, conversely, it is possible that what we consider that instinct, just because we all do it, may actually be culture.

On this point, a matter that has been discussed in the past is that of our sleeping platforms. These are simple beds that we build in the trees by using broken branches and lie down in. These sleeping platforms are found only among chimpanzees and gorillas. We lead nomadic lives and move around every day, so we use these sleeping platforms only for one night and make new ones every night. However, some have reported that those who were separated from their parents at a young age do not build these sleeping platforms. Among the chimpanzees raised at Yerkes's research center, there are many who were born there and have never seen a sleeping platform being built. So, we could try and take the chimpanzees out of the cages and let them roam free in a place with suitable trees to see if they will build sleeping platforms. That might give us a little more insight into whether this behavior is instinctual or cultural.

Human: Are there many behaviors like that?

Monkey: Let me give you another example. This also is about Yerkes's chimpanzees. One of them gave birth for the first time, but she had never seen a newborn before, so she didn't know what to do. The mother was uncomfortable initially and tried to gently nudge the baby with a stick, until she finally understood that she should nurse it.

We had never so much as doubted that something like a mother nursing her baby must be instinctual; yet, when we see something like this, we find that even this behavior shows signs of culture. Let us see what happens when we live in our natural state as a group, and a member of the group gives birth. In that case, she has learned by watching the mothers around her handling their babies. Thus, when she gives birth for the first time, even if no other individual comes to teach her directly, she can remember what she has seen before and take care of her baby just like the others. That is what I think.

Human: I've heard that human children who were raised by wolves never learned to understand human language and even ran on all fours like wolves. I wonder if the same is true for monkeys. Perhaps those that weren't raised among monkeys never become real monkeys. However, in contrast to what happens with children raised by wolves, do monkeys raised by humans from a young age become more human, more intelligent than wild monkeys?

Monkey: Yes, I think that does happen. At the very least, monkeys learn to use tools.⁴ These are things that wild monkeys can't even begin to imagine. They have been simply following the path of their ancestors, leading their lives as monkeys generation after generation. One of the factors is the difference between nature and the laboratory. In the laboratory, bananas are dangled from the ceiling, or food is left outside the cage, so the monkeys learn to stack boxes or connect sticks. In nature, however, we don't have to resort to these tricks. Simply living our lives as monkeys is enough to survive.

What would happen if individual monkeys raised and trained by humans—this intelligent group, so to speak—were to take the behavior they learned, perhaps not exactly culture, and bring it back to their home in the wild? Would it influence their home and give rise to a new culture, different from what came before?

Human: Ernest Thompson Seton's *Wild Animals I Have Known* (1898) discusses many cases of wolves and foxes raised by humans who went back to their pack of origin, where they dominated over others, but it doesn't go as far as to mention changes in culture.

Evolutionist: It is quite difficult to verify whether changes in culture arise after an animal is reintroduced to its home in the wild. However, it is certainly an interesting question.

Monkey: I think we could look at changes in the food we eat as cultural changes as well. Japanese monkeys that live deep in the mountains of Hida and Shinano live only on food that they find in nature. However, those who live closer to villages come and raid the loquat and barley fields cultivated by humans. This is not a change of instinct. To monkeys raised in groups that raid crops, doing so has unwittingly become a tradition, a custom that they continue to engage in even after their predecessors die. In other words, from their perspective, there is no other life for a monkey than raiding crops.

Human: The domestication of animals, as well, is more a change of culture than one of instinct, isn't it?

Monkey: That is certainly possible. After all, animals often are *trained* to be wary of humans by their parents. When they're young, they know nothing about fear. Baby monkeys, for example, are sometimes curious about humans. However, their mother teaches them that they should be wary or brings them away to keep a distance from humans. Thus, they learn that their own attitude toward humans should be one of fear.

⁴ Translation note: While we used the term "monkeys" in accordance with the original Japanese text, "monkeys" here clearly refers to chimpanzees. Imanishi uses the Japanese word for monkeys in this section in the broader sense mentioned in the previous translation note, which can refer to both monkeys and apes.

Conversely, monkeys that were raised by humans from an early age and have become accustomed to humans do not teach their young to fear them. In fact, at the Yerkes research center, there are even chimpanzees that trust humans to take care of their babies, and these individuals might already be on the way to domestication.

Group Living Animals and Culture

Human: Thus, the secret to taming wild animals is to raise them from a young age. I'm sure that even the cattle and horses that we have domesticated today were bred gradually from individuals that were tamed as calves or foals.

Evolutionist: That is possible in their case as well. However, animals that live in groups may have unexpectedly little individual fear compared with solitary animals. For example, when there is a leader in the group, others have a tendency to model their behavior after the leader. If the leader gives the alarm, then they heed. If the leader runs, then they run. Thus, if the leader doesn't fear humans, then other members of the group won't either. Considering this, it might be possible to win over an entire group by appeasing its leader, rather than expending time and resources to raise individual animals. In this case, if we were to take an animal raised by humans and introduce it into a group in the wild, as we have mentioned earlier, and if this animal managed to serve as an intermediary in the groups' habituation, either by appeasing the leader or by becoming the leader itself, that would undoubtedly be domestication through a change of culture, no matter how you look at it. However, that sounds a little too good to be true.

Without going that far, when wild elephants are captured alive, they are tamed by using elephants that are already habituated to humans. This example demonstrates that if we try and consider the problem of the *origin of domestication* as a matter of the animals' own culture, then that might lead us to imagine a new key to the solution.

Human: Another animal that lives in continuous groups is the honey bee, right? It is clear that we must recognize culture, which we once considered a human lifestyle, in animals closely related to us, like monkeys and other mammals, at least to some extent. However, can we recognize culture in animals, such as insects, whose relation to us is extremely distant, just as long as they engage in continuous group living?

Bee⁵: Ah, what a difficult question. Among us there is the digger wasp that builds its nest in the ground. When it's time to close the nest, it fills the entrance with tiny stones. It then uses these stones to pound and harden the soil over the entrance. This behavior has been discussed as an example of insects using tools. However, if we follow your discussion so far, even if the wasp uses tools, as long as that behavior stems from inherited instinct, it can't be considered the wasp's culture.

⁵ Translation note: The Japanese word used here—"hachi"—includes both bees and wasps.

Evolutionist: That's right.

Bee: The digger wasp is a solitary animal, so there is no doubt that its behavior of placing soil over the nest and pounding it with tiny stones is not learned by observation or taught. However, animals living in continuous groups, such as the honey bee, may have culture in the form of so-called *social heredity*, with no connection to inherited traits. To confirm that, it would be necessary to conduct experiments on individual bees who have never experienced ordinary bee life. However, that is quite difficult to do, right?

Evolutionist: First, although the groups formed by honey bees are called "societies," unlike human societies, they are closed kinship groups whose members' functions are significantly specialized. Considered in its entirety, such a group is quite similar to a body. Taking out a single individual would be, to use an extreme example, like tearing off a hand or a foot from our bodies. Therefore, although we might be able to observe the behavior of a single honey bee, we cannot study its life.

Thus, although this might be difficult, we would have to obtain a group of bee larvae, prepare a set of both future fertile bees and worker bees, and raise them artificially. We would then observe the behavior of these bees to see if they live as ordinary bees despite growing up in an environment without any experienced individuals. We can't really say anything until we confirm that.

Alternatively, if that is our goal, we could start with something simpler, rather than picking a subject as complicated as the honey bee.

Honey Bee

Bee: Honey bee and hunter wasp larvae do not search for food themselves but stay in the nest and grow up eating the food gathered in advance or brought to the nest by their mother—or the worker bees, in the case of honey bees. Thus, they rely on their mothers even more than humans do. The food the mother gives the larvae is often specific to each species and became fixed many generations in the past. When the larvae grow into adults and have their own young to take care of, they bring them the same type of food they were once fed by their mother. Thus, a specific type of food is passed down as the food of that species. However, is this instinct or culture?

Human: If these bees or wasps were raised artificially, growing up with different food than their mothers' and when raising their own young, they brought them the food of their ancestors, despite never having eaten it before, then that would be instinct. Alternatively, if they brought them the food that they'd actually experienced eating in their youth and not the food of their ancestors, then that would be culture. The eating habits of bees and wasps are culture in the same way as human eating habits are culture, right?

Evolutionist: Most hunter wasps and bees are solitary animals, not group animals. However, if this held true, if these eating habits were passed down directly either through family life or through direct or indirect contact between parent and

child—without the mechanism of heredity requiring the mediation of reproductive cells in the body—then we may certainly call this culture. If this were culture, once the eating habits had been artificially changed, the new eating habits would continue to be passed down going forward. If this were the case, then that would mean that the change in eating habits is a cultural change, as we have seen earlier in the example of monkeys.

Unfortunately, however, experiments where hunter wasp larvae were given different food than their parents only observed the wasps until adulthood. No one has ever conducted an experiment to look at what these wasps feed their young once they are adults.

Bee: Bee and wasp larvae grow up in nests built for them by their parents. Thus, their parents provide them with not only food but also a nest, and the nest is more or less specific to the species. Some are made by digging holes in the ground; others are ingeniously modeled out of mud in the shape of a pot or jar, and others still are sneakily built with bamboo tubes and the like.

Thus, when bees and wasps become parents, they must not only feed their young the same food they ate as larvae but also build their nest in the same shape as the one that sheltered them in their youth. Therefore, assuming that our food choices are cultural, could the same be true for the nests we build? If it turned out that one is culture, and the other one is not culture but instinct, we would not be quite convinced....

Evolutionist: Larvae don't have eyes, so they can't memorize the type of food they are given by looking at it. However, if they can recognize the smell of the food, they might seek out food that gives off the same scent when they become parents. Even if it is a formidable spider that they have never seen before, they just know that they should capture it.

However, in the case of nests, I doubt that the sense of smell is enough to successfully build a nest in the same shape as one's parents. Instead, building nests might involve memories formed by the individual as an adult. In other words, when the bee or wasp leaves the nest and observes the world for the first time, it first explores the area in which it will live, around the nest it just emerged from, and it develops an image of that space. So, when it needs to build its own nest, its behavior might be guided by the recollection of the nest it came from, that is, the nest built by its mother. In that case, this behavior may be cultural as well.

As in the case of food, conducting an experiment would further clarify this point. We could secretly take out the larvae from their parents' nest and place them in a different nest built by another species. Then, if the adults coming out of this nest build the same nest as their own mother, we will conclude that their behavior is instinctual. If they build nests modeled on the one they came out of, made by the other species, we will conclude that it is cultural.

Bee: Well, one example that is known today is potter wasps. They build cylindrical nests out of mud; however, they started nesting in thin bamboo tubes, and the behavior is now observed widely in the surrounding area. Another example is

hornets. They usually build large round nests in places, such as under the rafters of the main buildings of temples, but for some reason, they started building flat nests in the narrow spaces between wooden walls. The following year, many individuals were observed building the same flat nests in similar locations. They were probably the ones who had been raised in those nests. These examples demonstrate that at least some aspects of nest-building behavior might not depend entirely on instinct.

Human: In that case, isn't there a way to signal more clearly that a wasp came out of that particular nest, by drawing a mark on its body, for instance?

Bee: You will have to be careful with that, or you will get stung.

Evolutionist: Well, you could put it under anesthesia and handle it that way.

Human: The fact that wasps building cylindrical nests learned to use bamboo tubes sounds like a way to make their work easier, rather than something as significant as a change of culture. If they can't find a suitable bamboo tube, they can just go back to the earlier behavior of building the nest out of mud, right?

Evolutionist: Previously, this has been explained in terms of the plasticity of instinct. This is a view that widens the range of instinct, defining it not as rigidly patterned and absolutely inflexible behavior but as behavior that is subject to change within a certain scope and whose changes may be reversed within the same scope.

We believe that this view is correct. Because some variability has been recognized in the morphological traits of animals, it is reasonable to think that the same would apply to their behavior. However, how are we to confirm this? For example, studies looking at many nests of a single species of wasp have found that, while the vast majority builds round nests, only a small group builds flat nests. Thus, several studies have concluded that the nest-building behavior of this or that wasp displays some variability.

However, to argue that this is due to the plasticity of instinct, we would have to prove that some wasps raised in round nests build flat nests and that some wasps raised in flat nests build round nests. In practice, research simply has not gone to the effort of making this determination for individual wasps. However, if we continued to breed wasps in an attempt to confirm this, we might also find that wasps raised in round nests always build round nests and wasps raised in flat nests always build flat nests. What then? Because instinct is most likely inherited, perhaps this would indicate the existence of two strains: a round-nest-building strain and a flat-nest-building one. However, if nest-building behavior were cultural, then the results would be the same, and our findings could also indicate the existence of two nest-building traditions.

Human: Are you saying that before we use the term "instinct" to talk about bees and wasps, as well as monkeys, of course, we must prove that culture is not involved?

Evolutionist: Yes, I think so. However, if changing the nests or giving them different food did not produce observable effects, then that would automatically prove that the behavior is not cultural. Therefore, breeding a single generation of wasps would be enough to find out. If someone argued that one generation was not enough and we continued to breed several more generations of wasps, we might eventually observe some effects; then that would become a matter of inheritance of acquired behavior—a phenomenon that involves a switch between culture and instinct.

Let us consider the case of a Japanese child separated from Japanese people and raised among Americans. If, despite being raised in America, the Japanese child were to start speaking Japanese, not English, on their own, then that would mean that Japanese language is not culture but inherited instinct. If, after several generations, their descendants stopped speaking Japanese and started speaking English, then that would be a change of instinct.

Bee: I had never heard of “culture” until today, and at first, I could not fully understand it, but now I see that in our behavior, the thing that goes against instinct is culture. However, I wonder why it took so long to introduce this theory. If it had been proposed earlier, perhaps our position within evolution would be clearer by now.

Evolutionist: Conventionally, the opposite of instinct was thought to be intelligence. Instinct and intelligence—that surely sounds right. In English, they are called instinct and intelligence.⁶ However, there is no systematic relation between the two. It is impossible to define instinct based on intelligence or intelligence based on instinct. Regarding studies on instinct and intelligence, behavioral psychologists only cover intelligence in their experiments and basically dismiss instinct without even attempting to address it. Some even use instinct as a byword for puzzling behavior.

The reconsideration of instinct began because of the new position of historicism, which surpassed the earlier behaviorism. Thus, instinct came to be defined as inherited behavior, as opposed to behavior that is not inherited and must therefore be acquired, that is, culture. However, in due course, this development will expose the fact that considering animal behavior as completely instinctual without any evidence was a kind of dogma, and considering only human behavior as cultural was a dogma as well. This is our first aim.

Mechanism and Teleology

Evolutionist: Let us move on to the next problem—although it is not completely unrelated to what we were talking about just now. Rather, I would like to expand on our previous discussion.

⁶ Translation note: Here Imanishi uses the Japanese phoneme style (“i”- “n”- “su”- “chi”- “n”- “ku”- “to” and “i”- “n”- “te”- “ri”- “ze”- “n”- “su”). The Japanese words for instinct and intelligence are “hon-noh” and “chi-noh.” The sentence “that surely sounds right” means that both words end with the sound “noh.”

In the world, the idea that animals live by instinct and humans live by culture is inextricable from the belief that animals, who live by instinct, are never aware of the purpose of their behavior, and humans, who live by culture, know the purpose of their every action. Thus, the idea has been circulated far and wide that the difference between animals and humans lies in this psychological difference between how animals and humans live.

However, now we must correct ourselves, recognizing that even animals do not live only by instinct but can, to some extent, have culture. Thus, we have to reexamine the distinction between humans and animals, which used to be based on knowing or not knowing the purpose of one's behavior. I would like to know your thoughts on this point....

Monkey: Well, when chimpanzees see bananas dangling from the ceiling, they stack up boxes. In this case, they attempt the action of stacking up boxes for the purpose of getting the bananas. If the bananas were in a place they could reach with their hands, they certainly would not resort to this behavior.

Human: It's not easy to tell the purpose of a behavior. The purpose of stacking up the boxes is to get the bananas. However, what is the purpose of finally getting the bananas? Satisfying their appetite, perhaps? Even we humans don't understand the purpose of our every behavior. However, our behavior is not random. It has direction and goals. We act and strive in an attempt to achieve these goals.

Bee: Acting in pursuit of a goal is something we do as well. Whether the behavior is instinctual or cultural, it may very well be the same on this point.

Evolutionist: Behaviorists would say that the goal triggers the behavior. Once the goal is achieved, the pull of the goal ceases, and concurrently, the behavior ceases as well. The goal is the stimulus that triggers the behavior, and the behavior of trying to achieve the goal is a reaction to this stimulus. Therefore, if the behavior of trying to achieve the goal is for the purpose of achieving the goal, it follows that all the behavior triggered by the stimulus is for the purpose of reacting to the stimulus.

Knowing or not knowing the purpose of the behavior is a matter of whether, when we execute the action triggered in this way, we know what its effect will be, or in other words, whether we take the action while predicting its effect.

For instance, the phenomenon of moths flying into a flame is often taken as an example of animals ignoring the effects of their behavior. Conversely, chimpanzees stacking boxes predict the effect of their behavior, expecting that it will allow them to reach the bananas. They try and get the bananas precisely because they know that bananas are their favorite food and that they will enjoy eating them. Thus, they are indeed predicting the effect of their behavior.

Bee: All right, now it's much clearer. But when we observe a behavior, how can we tell if it's done while predicting its effect, or simply triggered by an uncontrollable pull toward the goal?

Evolutionist: That's exactly my point. Refusing to confirm that and considering all animal behavior as executed without predicting its effect is, again, nothing but a dogma.

Human: However, as long as animal behavior is instinctual, isn't it unnecessary to predict its effect? If instinctual behavior is inherited behavior that develops automatically given a certain stimulus or situation, then this behavior should develop regardless of whether its subject knows its effect or not. Moreover, because only apposite behavior is inherited as instinct, owing to the sifting of natural selection, animals should have no trouble living without knowing the effects of their behavior.

Evolutionist: That was the conventional idea, yes. However, it is only an idea, in every respect. That idea is known as "mechanism," whereas the idea that animals can predict the effect or know the purpose of their behavior is called "teleology." Between the late nineteenth century and the early twentieth century, mechanism was methodologically superior, so teleology was considered incorrect.

Mechanism became methodologically superior due to the growing respect for experiments. Waving around teleology without so much as conducting an experiment was criticized as a form of anthropomorphism. The mechanist position formed the basis for the establishment of behaviorism. However, behavioral experiments were limited in scope to stimulus and reaction, or goal and goal-directed behavior, neglecting to observe the effects of the behavior itself. However, until we observe the *effects of the behavior*, we can't tell whether the animal acted while predicting them.

Human: I'm not sure I understand. How can we tell by observing the effects of the behavior?

Monkey: I think I understand. As you said earlier, bananas are chimpanzees' favorite food. Accordingly, researchers conducted the following experiment. They placed bananas under a box where a chimpanzee could see.⁷ Then, they took the chimpanzee out of the room and secretly exchanged the bananas with lettuce. Finally, they took the chimpanzee back into the room and released him. When he did, the chimpanzee hurried to the box. He remembered that bananas had been placed under it. He lifted the box and found lettuce rather than bananas. Looking incredulous, the chimpanzee carefully inspected the box, but the bananas were nowhere to be found. Exhibiting no interest in the lettuce at all, he wandered off.

It's not that chimpanzees don't eat lettuce. But in that case, he clearly acted with the expectation of bananas. Therefore, he would've had to find bananas under the box to be satisfied. He must have been very disappointed when out of the box came not the bananas he was expecting but only lettuce.

⁷ Translation note: The original experiment that Imanishi appears to be referring to was conducted with macaques and not chimpanzees (Tinklepaugh, 1928). However, as Imanishi uses the term "chimpanzee" and not "macaque" or "monkey," we have decided to keep his original description.

Bee: A somewhat similar case is an experiment on the behavior known as the “homing instinct of the honey bee.” Honey bees have an instinct to return to the beehive; but in the experiment, the researchers moved the beehive a short distance away. As the group of bees who had been searching for nectar began to return gradually, they all landed in the place where the hive used to be. I don’t know whether it was instinct or not, but their sense of direction was really accurate. However, what was the effect? They weren’t satisfied to have returned to the correct place because the hive was not there. They wandered around for a while, until they found the hive a short distance away.

They returned expecting the hive; however, because it was not there, they started wandering around. Moreover, they didn’t just wander; they wandered looking for the hive. That is something that goes beyond any mechanic relationship between stimulus and reaction and qualifies as an action taken while predicting its effect, don’t you think?

Evolutionist: Honey bees’ behavior of returning to the hive without losing their way is not learned from other bees through observation or teaching. Therefore, I think we can call it instinct. If that is the case, this example might demonstrate that, just because a behavior is instinctive, that doesn’t mean that the subject is not predicting its effect.

However, there is a clarification we should make on this point. Considering that these animals predict the effects or know the purpose of their behavior does not necessarily imply conscious action, a mechanism regulated by the cerebral cortex, in the same way as we have. From our standpoint, the possibility of an association with conscious action must be regarded as its own separate problem.

In other words, if we could prove whether animals predict the effects of their behavior directly from the behavior itself, without any neurophysiological evidence, we would have no basis to deny that. Yet, scientists have been stuck on this matter until today, without having the courage to make this argument. They are content to continue to explain animal behavior in a mechanical way. Even in academia, it always takes courage to break down myths.

Human: I must confess that when I read your latest book, *Society Before Humans* (Iwanami Shinsho, 1951), I was really surprised that teleology was involved. It felt scandalous that a scientist would nonchalantly say something like that.

Evolutionist: I guess so. I’m sure there are others who feel the same way. The responsibility lies with educators. When this field of study was first introduced to Japan, as I have mentioned, the consensus was that mechanism was right, and teleology was wrong. Today, however, we consider both valid, rather than just one or the other. We can’t fully explain animal behavior without recognizing both of these perspectives. However, the fine professors who write zoology textbooks have yet to get this correction into their heads. Consequently, in middle school or high school, you have probably been indoctrinated with the almighty power of mechanism—an idea straight out of the late 1800s.

Human: However, in those textbooks, topics, such as the hunter wasps' maternal instinct, were addressed as behavior whose effects are predicted without complaint....

Bee: That might be a misunderstanding. Saying that the mother wasp lays her eggs after gathering prey in an underground nest to ensure the safety of both the larvae and the food surely sounds like the wasp is predicting the effects of her behavior. Yet, the mother wasp has no way of knowing that doing so will actually keep the larvae and prey safe. Hunter wasps are solitary animals, and the mother often dies before her young have reached adulthood. How can the mother wasp, who has never confirmed whether her behavior leads to safety or not, predict that the effect will be safety?

Indeed, even if the hunter wasp does all that, sometimes the effect is that tachina flies hide in the nest and kill the larvae. Thus, it seems unreasonable to say that she is doing it for safety.

Human: In that case, it must be mechanism. Perhaps it's only a matter of natural selection.

Evolutionist: Not necessarily. Safety is a problem; however, if the hunter wasp didn't hide the prey it stung and captured, and simply laid its eggs on top of it, then the larvae would be 100% unsafe. Compared with that, although it might be impossible to ensure 100% safety for the larvae, hiding them is indeed safer.

In this case, if there are wasps that hide their prey and wasps that do not, then the larvae of the former will live, and those of the latter will die. If we call this natural selection, then natural selection also deals with the issue of safety. If that is compromised, natural selection also vanishes into thin air.

Moreover, the problem here is the premise itself. If there are wasps that hide their prey and wasps that do not, and 100% of the latter's larvae end up dying, that is the same as those wasps never having existed at all. The life of hunter wasps would not function if they didn't hide their prey in the first place. In short, the behavior of hiding prey did not arise from a process of natural selection between the wasps that hid their prey and those that did not.

Bee: Therefore, it's useless to try and rationalize the prey-hiding behavior of hunter wasps by connecting it with safety. Perhaps, to hunter wasps, food for larvae must be underground, or food that is not underground is not seen as food at all.

Human: Even among humans, food must be served in containers. If it's placed directly on the ground, it is not food anymore, regardless of its original value. That kind of thing would be culture, right?

Evolutionist: We can't know if it's culture or instinct unless we conduct an experiment. However, we think that, before finding the prey above ground and hiding it underground, hunter wasps used to search for the prey that lived in the soil and lay their eggs there. Thus, we don't have to assume that the wasp's prey-hiding behavior is motivated by safety. There is no reason at all why we can't consider

it a less rational behavior, a tradition that the wasps have simply followed until today. Not focusing on whether this behavior is useful or apposite might pose a problem in terms of the theory of natural selection. However, evolution that follows such an irrational course can be found in many facets of the natural world.

Human: The behavior of not hiding the prey was clearly irrational from the start, but the behavior of hiding the prey, which appears rational at first glance, turned out to have an irrational motivation. Even in human behavior, that is not infrequent. So, I might have been wrong to think that your book supported teleology.

Evolutionist: Not at all. Teleology does not simply mean that animals act while predicting the effects or knowing the purpose of their behavior. Even behavior whose effect is not predicted must have an effect. When we go in the opposite direction, starting from the effect and looking at the behavior that caused it, there we find teleology. This type of teleology plays the role of a working hypothesis in the field of science.

Adaptation and Adjustment, Evolution and Progress

For example, animals don't know about individual preservation or species preservation. Yet, when they're hungry, they look for food, and when they meet an enemy, they run away. Similarly, they look for an individual of the opposite sex to mate with, and they take care of their young who cannot survive on their own. All the animals we know of do this. In other words, this is *animal life*, and there is no animal life but this.

However, looking for food when one's hungry and running away from enemies was useful for individual preservation. Meanwhile, mating and taking care of offspring was ultimately useful for species preservation. Thus, based on these facts, we say that animals live for the purpose of achieving individual preservation and species preservation. In doing so, we are first introducing this as a working hypothesis. Once it's clear that no facts contradicting this working hypothesis will readily appear, we may even raise it to the level of an axiom.

However, what I want to reiterate is that this working hypothesis has been introduced to explain the historical facts of animals, so to speak, and not every single behavior in the day-to-day life. A single behavior is necessarily self-contained. We might also say that it has its own particular goal. However, when it comes to evolution, we can't help but see it as history, and when we set out to explain history, we unavoidably encounter this working hypothesis. Thus, even if we explain the hunter wasp's prey-hiding behavior not as predicting safety for the larvae but simply as upholding a tradition, beneath this preservation of tradition lies, of course, as its explanatory principle, the preservation of the species. In that sense, somewhere or other, we can definitely catch a glimpse of something teleological.

Human: Professor, I've heard you mention the "law of scale" before. I think seeing this as a law of scale that is applied to historicism would make things quite clear....

Bee: That's right. No matter how many discussions we have, if our time measures are different, there can be no discussion at all. However, because we have the opportunity, there is something we'd really like to ask you. We're satisfied with your explanation on the evolutionary history of hunter wasps, but what about bees? There are solitary species, species living in groups, such as the honey bee, and other levels in between. What is the consensus about the evolutionary history of bees? I think it would be somewhat risky to conjecture the evolutionary history of a nectarivore, such as the bee, based on that of a carnivore, such as the hunter wasp.

Evolutionist: The evolutionary history of bees has not been studied in detail yet. However, I think that, up to a point, they must be explained in the same way. Thus, when we clarify the evolutionary history of the bee, we might also have to correct that of the hunter wasp as we know it today.

Whenever archeologists conduct a new excavation, they correct their theories up to that point. We should do the same. When we discover a new fact that we can't explain, we should change our theories, making them more general and inclusive. Thus, there is no final theory—only the latest theory at any given time.

Human: Even if the theory of natural selection provides a mechanist explanation of every facet of behavior, as long as it is based on individual preservation and species preservation, it can certainly be considered teleology.

Evolutionist: Because Darwin was an extraordinary naturalist, he certainly observed animals from a broader perspective than did later behavioral psychologists and geneticists. The theory of natural selection was made mechanical not by Darwin but by the evolutionists that followed him—August Weissman, for example.

The weak point in the theory of natural selection is the same for traits and behavior alike. As the struggle for existence takes place, through survival of the fittest, weaker beings are eliminated. Differently put, perhaps we could say that less evolved beings are replaced by more evolved ones. However, when we notice that various levels of beings exist in the life of bees or hunter wasps, that creates a contradiction. In short, even today, beings on a lower evolutionary level peacefully coexist with those on a higher one. However, it would not be enough to simply point to a phenomenon that the theory of natural selection can't explain. We must also propose an alternative theory. That is why, in *The Logic of Organic Society* (Mainichi Sensho, 1949), I presented my theory of habitat segregation in opposition to this.

Human: Both the theory of natural selection and the theory of habitat segregation are premised on the idea that the lives of the animals we see in the world today are adapted to their environments. We should conduct more experiments where we modify the environment and observe how animals adapt to it.

Monkey: Chimpanzees raised in laboratories adapt wonderfully to an environment that was not experienced by their ancestors.

Evolutionist: That is not adaptation; that is behavioral adjustment. The word “adaptation,” when used as a scientific term, must have a more limited meaning. It refers to traits or behaviors that are preserved through natural selection because they are advantageous to the animal. Due to its ties to natural selection, adaptation can only have a mechanist explanation and is thus tentatively considered a genetic phenomenon. Thus, adaptive behavior is regarded as inherited, that is, instinctive behavior.

Adaptive behavior therefore must be distinguished from noninherited, acquired behavior. We are calling this “adjustment.” This type of behavior is acquired, and if it is learned by observing or being taught by an individual of the same species, it qualifies as culture. In a way, it also can be understood as learning.

Human: In that case, what is the distinction between acquired behavior as culture and acquired behavior as learning?

Evolutionist: Right, that is difficult to discern when they are discussed together. I think it is a difference of order. Culture does have some elements of learning, but it refers to behavior that is already fully adjusted in the natural state. Conversely, learning refers only to behavior that is newly adapted in the laboratory, under different conditions from those in the natural state. Culture is behavior that is already socially approved, whereas learning is more individual behavior that has not reached that stage yet. To put it differently, from the perspective of the law of scale, which we mentioned earlier in the context of history, we could say that culture is more long-term, and learning is more short-term.

Human: Animal learning always involves rewards in the form of food. You could say that we entice animals with food. Thus, perhaps the animal learns, because it predicts that it can get food by performing a certain action.

Evolutionist: That is exactly right. Learning requires a prediction of results based on experience. Therefore, when that expectation is betrayed, and the reward is not achieved, the animal becomes angry or disappointed.

Human: It is the same when parenting human children. When you want to curb a behavior, you scold them or punish them.

Evolutionist: One of the characteristics of learning is that, when you reward an animal for a behavior, at first the animal will only see a weak connection between the behavior and the reward; however, as it continues to repeat the same experience, it will gradually come to see a stronger connection between the two, and it will take the desired action more quickly. In other words, once it establishes the expectation that a certain behavior will be followed by a reward, the animal will react more quickly out of a desire for the reward. Conversely, if the animal is punished, it will stop the behavior sooner.

This change in reaction speed would be unthinkable for a behavior based on inherited instinct. Thus, animals that adapt their behavior by instinct are not flexible

when met with changes in their environment. Conversely, animals that can adjust their behavior by learning are flexible when met with changes in their environment. Considering cases where environmental changes trigger the action of natural selection, we might even say that the action of natural selection is stronger in animals that are less flexible and mostly rely on instinct and is weaker in animals that are more flexible and mostly rely on learning.

Bee: Natural selection works by subtraction and elimination, so the driving force of evolution and creation must be somewhere else. If animals relied only on instinct, they would have to depend on the unpredictable mutations of instinct. However, if animals can learn, that opens up the path of adjustment through trial and error. The question is how this path of adjustment found by an individual is passed down to the next generation.

Evolutionist: Individual experiences first become culture when they are passed down to the next generation. Thus, we might even say that the behavior is refined generation after generation.

Conventionally, when biologists talk about evolution, they are not thinking about progress. As long as evolution can continue through mutation and natural selection, perhaps that is all right. However, what should we make of learning? Increasing our reaction speed by gaining experience— isn't that what we usually mean by "progress"? In that case, we should call progress the act of extending the learning process to the next generation, gradually perfecting an adjustment over multiple generations. However, at this point in time, this is no more than a theoretical postulate. The facts to answer this postulate are yet to be discovered.

Human: Now I get it. Until today, scientists have been focused on instinct, instinct mutation, and natural selection. Consequently, nobody even noticed this possibility.

Monkey: In the case of Yerkes, although the chimpanzees didn't become human, being raised by humans for several generations would change them in significant ways.

Human: In the case of dogs, too, I don't think the selection and combination of existing genes would have been enough to make them what they are today. It must not be adaptation but adjustment. Hunters say that in the case of hounds, the older dogs train the puppies themselves.

Evolutionist: In that case, that would be the hounds' culture. At any rate, until we conduct more experiments, we should avoid jumping to conclusions about whether any behavior by an animal is culture or instinct. Still, we may conjecture that animals that are capable of learning in an experimental setting do, to some extent, have culture. Conversely, it would be difficult to conjecture the existence of culture in animals that are incapable of learning. I think this is a reasonable guess to make.

Above all, depending on the person, there are some who see any change in behavior reported in an experimental setting as learning. There have been experiments where regulating light and darkness conditions led to changes in the daily rhythmic activity of sea cucumbers. This is similar to the behavior of some species of plants, which grow shorter when they stand on mountaintops and taller when they are cultivated in lowlands. This can hardly be called learning. The “learning” that I’m talking about is an action taken while predicting its effect.

While instinct is not necessarily behavior whose effect is not predicted, culture, whose acquisition involves a learning process, is obviously behavior whose effect is predicted. Therefore, if we recognize, at least, that animals have culture, we must then correct the assumption that they act without predicting the effects or knowing the purpose of their behavior. However, although we talk about purpose and predicted effects, these are tied directly to single actions. Animals are unaware of individual preservation or species preservation when they act. In this sense, they are not idealists but rather follow the principle of *carpe diem*.

Let us leave it at that and move on to the next topic.

Individuality and Personality⁸

Evolutionist: The next question is as follows. In the world, animals may display sex differences, but other than that, animals of the same species are all alike. There are almost no individual differences. Conversely, humans have unique faces and characters. This is why zoology takes the species as its unit and does not study individuals, whereas humans are always studied as individuals. Human history, even when it’s the history of the species, is always mediated by individuals. We tend to think that this is a big difference between animals and humans.

However, is that really the case? When we get to the bottom of it, we might find that this is actually a difference of degree.

Monkey: Of course, we also have individual differences. We do have different faces and different characters as well. This is clear from the fact that lab-raised monkeys score differently in experiments depending on the individual. Even among Wolfgang Köhler’s chimpanzees, there were some clever ones and some not so clever ones. Therefore, I’m not sure I understand why you’re bringing up this question at all.

Actually, today’s roundtable feels odd as well. I don’t mean to complain, but at the start, you said that we’d recognize the similarities between us from the perspective of both humans and animals. To do that, I think you should cover the humanity found in animals and the animality found in humans equally. Instead, in your role as

⁸ Translation note: Similar to the case of culture (*karuchua*), Imanishi uses the Japanese phoneme expressions of the English terms “individuality” and “personality,” instead of using the Japanese equivalents of these terms.

moderator, you have emphasized only the humanity of animals, such that to us animals, this feels less like a roundtable and more like being questioned on the witness stand....

Evolutionist: As the moderator, I sincerely apologize for making you feel that way. You're right; when we compare humans and animals, we should cover both the humanity of animals and the animality of humans equally. However, for one, a roundtable has time constraints; thus, if the discussion gets too broad, it might be hard to wrap up.

Moreover, the animality of humans has been an issue ever since the early days of the theory of evolution. Tackling this issue led to the conclusion that humans actually evolved from animals. Regardless, humans strove to assert that there was some difference between them and animals, and, as I mentioned in the beginning, this had a negative effect on the theory of evolution.

Conversely, some say humans have characteristics that were given to them directly by God, which are different from products of evolution and which animals do not have. Finding these characteristics in animals might stray from the orthodox path of the theory of evolution, but I think it is one possible way to approach evolutionary studies. The expressions "humanity of animals" and "animality of humans" are extremely ambiguous and relative in the first place. After all, doesn't the humanity of animals become the animality of humans when seen from a different perspective? We are not evaluating the human camp and the animal camp to choose which one to side with; we are simply trying to shed some light on the facts of evolution, so I hope you understand and forgive my carelessness as a moderator.

Monkey: All right.

Human: So, individual monkeys also have different characters and score differently in experiments. Are those differences genetic, or are they environmental?

Monkey: Well, we don't know for sure yet. However, if different characters are like different faces, then perhaps they might be genetic.

Human: Even with plants, if you look closely at some pine trees, you will see that, although they're the same species, the shapes of their branches are different. However, that is not necessarily genetic. When it comes to faces, although a child may resemble their parents, we don't know how much of that is genetic.

Meanwhile, despite their individual differences, pine trees all have common characteristics that we can use to identify them as pines. In terms of character as well, when we compare chimpanzees among each other, we may find some relatively big differences. However, when we compare the characters of chimpanzees to those of gorillas or Japanese monkeys, those differences tend to be obscured by the greater differences between chimpanzees and gorillas, or chimpanzees and Japanese monkeys.

Perhaps that means that the chimpanzee character, the gorilla character, etc., are genetically inherited.

Evolutionist: We must recognize both interspecific differences and intraspecific, individual ones. However, questioning whether these differences are inherited is, in other words, exactly the same as questioning whether character is acquired.

Moreover, we can only perceive character through behavior. Therefore, the only way to judge whether character is acquired is based on whether behavior is acquired. Moreover, we can't tell whether behavior is acquired unless we know the life history experienced by the individual animal in question. Experimenting on animals without knowing their personal history, as we have done until today, poses a problem on this point. This demonstrates that it's time to go beyond conventional behaviorism and adopt the perspective of historicism. Methodologically speaking, we must make our experiments more accurate and thorough.

Bee: Leaving interspecific differences aside for now, intraspecific differences are very common. A recent study on paper wasps has demonstrated that females who leave their place of hibernation early in the spring start to build their own nests; at this point, however, some stop building their nest, join another female, and become her worker wasps. Female wasps, who are supposed to become independent adults and reproduce, wish instead to become worker wasps that will not reproduce. Leo Pardi has explained this phenomenon in terms of competition, but we also could see this as cooperation between the two females.

Evolutionist: We used to think that only infertile wasps from the same hive could be worker wasps. That was why they could serve as emissaries for another female. However, this phenomenon demonstrates that worker wasps can originate in two different ways. I haven't read the original, so I don't know all the details yet; however, I think that the life history experienced by the female who became a worker wasp should be considered. Does every female become another female's worker wasp if placed under certain conditions? This is definitely worth trying to replicate.

Bee: Theft among hunter wasps hasn't been studied in an experimental setting, but it has been observed in the wild. There are hunter wasps that, despite belonging to the same species, do not hunt their own prey but steal the prey captured by others. The other wasp digs a hole in the ground, puts the prey inside, lays her eggs, and carefully covers the hole. All the while, the thief is watching her every move. Leaving no easily detectable trace that there is prey hidden under the ground, the wasp leaves the site.

Then, the thief opens up the nest and burrows inside. She eats the eggs that have been laid there, and she lays her own eggs in their place. Subsequently, she repeats the same actions as the wasp that dug the hole, covering the nest again and trying to leave without a trace.

Evolutionist: This might have something in common with the paper wasp you just mentioned. In the case of the paper wasp, if the situation is such that there is not enough prey for two females with two separate nests to both raise their young, one of the two gives up on building her own nest and becomes a worker wasp in the other's nest. We also could say that this creates a division of labor between the two females, with the new worker wasp being fully in charge of hunting prey and nursing the young and the other wasp devoting herself to laying eggs.

However, this division of labor is possible because paper wasps function as a superorganism system. If they didn't, they might be forced to steal each other's prey. Because hunter wasps are solitary animals, when prey is scarce, they resort to stealing from each other. However, because hunter wasps hide their prey, stealing in secret is a cleverer method than snatching it directly from others.

Bee: However, if they absolutely cannot hunt prey on their own, as a last resort, isn't it okay for them to behave this way?

Human: It seems obvious that, if hunter wasps can't find the prey that they need in the soil as they hunt, and they see another wasp placing that same prey in the soil, they will want to lay their eggs there.

Evolutionist: That is something we could experiment on. We could take an underground nest where the prey has been placed, cover it with a cage, place another female wasp inside, and observe her behavior. If all females stole under these circumstances, that would exclude individual differences.

However, if some females stole and some didn't, that would complicate things, right? The larvae won't know whether the prey was painstakingly hunted by their parent or simply stolen. Thus, when they become adults, they will probably hunt their prey like all the others. In other words, while this behavior is acquired, it is individual behavior that cannot become culture.

Moreover, if we found out that those larvae, after becoming adults, went on to steal like their parents did, we could conclude that the behavior is definitely inherited. That would surely be difficult to study; however, without verifying this point, even an observation as interesting as this one will not make much of a contribution to science.

Human: Thus, if acquired behavior includes both behavior that is limited to the individual level and behavior that is cultural, that is, socially approved, it follows that differences in character should be judged only based on individual behavior.

Evolutionist: Right, I was just about to say that. If behavior is individually acquired, like the hunter wasp stealing, it might be limited to one generation and not be passed down to the next. However, this is the misfortune of solitary animals. Group animals, meanwhile, may often seize the opportunity to make individually acquired behavior into culture.

Regardless, individually acquired behavior by itself is rather inconspicuous. Therefore, it's not without reason that little attention has been given to individual differences in character, which can only be judged based on individual behavior.

Human: Why, then, do we respect individuality in the case of humans? I think this is an important point...

Evolutionist: Respecting it or not respecting it is a matter of culture. The terms "individual difference," "individual variability," and "individuality" apply to both morphological and behavioral differences and thus to character differences as

well. Our discussion refers to this last meaning, in particular, so I think it would be clearer for us to talk not about “individuality” but about “individual personality.” Personality⁹ often is translated as “personality” (“jinkaku,” in Japanese), but it sounds like it has ethical implications, and I don’t like it.

Previously, we said that single animal behaviors are self-contained. Despite that, there is a functional unity that creates some form of connection between them to prevent them from coming apart from each other. From a behaviorist perspective, that unifying system is personality.

The behavior that is woven into this system includes both individual behavior and social behavior in the form of culture. Moreover, because personality is the unifying system of both these forms of behavior, identifying and isolating individual personality is actually quite difficult.

From a procedural perspective, we may interpret social or cultural personality as behavior that is displayed by all individuals in the form of culture and individual personality as the remainder of personality, which is displayed by single individuals. I think this would allow for a much more precise analysis.

Human: I’ve never heard of “social personality” or “cultural personality” before, so they don’t sound familiar. Could you explain them in simpler terms?

Evolutionist: Saying that groups are formed by individuals is a merely anatomical approach. From a functional perspective, what prevents the group from splintering into individuals is culture, because a shared culture serves as a medium to tie individuals together. Differently put, individuals don’t become real members of the group until they share its culture.

To express this in terms of personality, regardless of individual personality, individuals aren’t treated as peers unless they possess cultural personality. Some may tolerate not being treated as peers; however, if they suffer from it, what they must do is acquire a cultural personality. This will allow them to display the same reactions and unified behavior as their peers, that is, to become real members of the group.

Monkey: Here’s an example that I think relates to that. It’s about Yerkes again and four of his chimpanzees who were raised together. When Yerkes was taking one of them to an experiment, the chimpanzee, who hated experiments and didn’t want to go, started screaming loudly.

Hearing the screams, the other three chimpanzees prepared to attack and jumped on Yerkes at once. One of them even bit his arm.

Something similar happened to him with other chimpanzees as well. They also were four, raised together, and one was being taken to an experiment. That chimpanzee, who hated going to experiments, started screaming loudly. Hearing that, the other three ran to him as though to save him—up to this point, the situation was exactly the same.

⁹ Translation note: Here again, Imanishi uses the Japanese phoneme expressions of the English word “personality” instead of using the Japanese word (“jinkaku”) to avoid the connotation that the Japanese word has in the context of daily use.

However, although the three chimpanzees came running, they didn't attack Yerkes, as if they made a judgment about the situation. Ultimately, they pushed the reluctant one toward the door, as though telling him to stop fussing and just go to the experiment. However, Yerkes, who had learned from his previous experience, had let go of the chimpanzee as soon as it started screaming. We don't know whether these chimpanzees, too, would have attacked him if he hadn't let go, but we think that this indicates a difference of cultural personality between the two groups of chimpanzees.

Evolutionist: What a great example. It perfectly encapsulates the relationship between culture and cultural personality. The second group had received more training than the first, and going to experiments when requested was their culture, so to speak. Being opposed to that and screaming might be viewed as a result of individual personality, but the screams did not elicit the expected reaction from the others. Instead, the chimpanzees encouraged their screaming companion to go to the experiment. They were telling him to follow their culture.

If this happened over and over again, even the rebel chimpanzee would stop his ineffective screaming and would obediently go to the experiments when requested as the others do or as the others expect him to do. In that case, we might say that he developed a cultural personality.

Human: Can cultural personality develop no matter how small the group is?

Evolutionist: The size of the group doesn't matter. The boundaries of the group are the boundaries of the culture, and the boundaries of the culture are the boundaries of the group. To put it in an extreme way, every family and every group has its own culture. Thus, the members of that family or group also will have a corresponding cultural personality.

In practice, however, this centripetal act of formation is coupled with a centrifugal act of formation, and diffusion works in contrast to concentration, such that neighboring families or groups have similarities in their culture and cultural personality. A significant similarity between individuals of the same species must reflect the existence of some form of communication between them. Even between different species, if the cultures are alike, communication may not be impossible.

Bee: This might be instinct rather than culture, but the behavior of insects, such as *the rove beetle* or *the silverfish*, which live inside ant nests, is nearly identical to that of ants. They behave like ants and pester them for food, so the ants give them food. From our viewpoint, the ants are being tricked, but perhaps they're actually making friends.

Human: I don't like how cultural personality tends to suppress individual personality.

Evolutionist: Well, that's relative. If one is born in a time when a fully formed culture approaches a period of refinement, then cultural personality will suppress individual personality. At that time, society stabilizes and becomes traditional and conservative. However, culture transforms as well. When a once stable society becomes destabilized, its culture may change. What really counts, then, is not ready-made cultural personality but individual personality. If one is

born in a time of change, they may even be able to suppress cultural personality with individual personality.

Human: In terms of its creativity, individual personality is similar to the genetic phenomenon of mutation. Even if a mutation occurs, several external factors have to line up for that to develop and settle into a new species. Similarly, the fate of individual personality depends on whether the world around it is in a position to accept it.

Evolutionist: I'd like to note something else as well. The less differentiated a society is, and the more uniform and even the lives of its members are, the easier it is for culture to create a unified system of behavior. In other words, cultural personality dominates over individual personality.

Conversely, if society becomes more complex, culture also will diversify, and it won't be possible for every member of society to share every part of this diversified culture. In other words, not only do the cultural personalities of the members become diverse but also multiple cultural personalities overlap within the same individual—the cultural personality of the family, that of the workplace, that of the group of friends with the same hobbies, and so on. If things don't go well, this might even lead to a split in their personality. Then, the thing that ultimately gives unity to all of these disparate cultural personalities is individual personality.

Thus, although individual personality is overshadowed by cultural personality, from the shadows, it is constantly pulling its strings.

As you all know, animal societies in nature are incomparable to our own in terms of stability and are generally extremely uniform. Thus, when looking at personality among animals, what matters is not individual personality but only cultural personality. However, in the case of humans, even when society is not going through major changes, because we lead such complex social lives, we always have to consider the individual personality hiding in the shadows.

Human: Well, I have to admit that convinced me. But I'd like to know more about the development of individual personality, which is so important to humans. I personally think there's a genetic component....

Bee: However, if we recognize a genetic component, won't that deny the distinction between instinct and culture?

Evolutionist: That is a real problem. Because humans grow up immersed in culture since birth, to identify human instinct or innate character, we'd have to experimentally create humans who are isolated from culture, or we'd have to make more humans be raised by wolves or monkeys. Both of these things are virtually impossible.

Thus, if we hypothesize that individual personality, like cultural personality, is acquired after birth—a position we might call “cultural school”—we must attribute the development of individual personality to more incidental, individual experiences that can't be considered culture. Psychoanalysis, for instance, views it as the result of psychological scars in childhood.

Bee: That might be the case for humans, but what about insects? Their behavior, like their morphology, mostly depends on the species. However, while this fixed behavior

might include aspects that are based on culture, it also includes many genetic aspects that are based on instinct.

In that case, while behavior determined by culture may have cultural personality as its unifying system, behavior determined by instinct has no such personality to consider. Thus, if we consider a certain behavior by an animal as cultural and another as instinctive, when the animal engages in cultural behavior, its personality is at work, but when it engages in instinctive behavior, that personality suddenly disappears. To work as a unifying system, personality is supposed to be perpetual. However, in this case, we have no choice but to imagine such an intermittent personality. If this occurred in a human, it would be a clear-cut symptom of mental illness.

What I'm trying to say is that, while I don't know if it's personality or not, there must be something that unifies both cultural and instinctive behavior within an individual animal, without leaving them disconnected. Moreover, I wonder if even animals whose behavior is recognized only as lowly instinct have something that serves the function of unifying their behavior. What do you think? Even animals that display only instinctive behavior seem to be far better at unifying it than mentally ill humans. Don't you think their behavior is consistent?

Evolutionist: Those are some sudden questions. They also have to do with the subjectivity of animals. This is a problem I've been grappling with since I wrote *The World of Living Things* (Kyoyo Bunko, 1941). Unfortunately, nothing has come of it—the world of instinct is still as obscure as ever. Regardless, as an evolutionist, I feel a responsibility not to leave this world in perpetual obscurity. Therefore, I take concepts, such as culture and personality, which were once applied only to humans, and I use them to shed light on the obscure world of animal instinct—albeit perhaps with a top-down approach.

However, if you're wondering how far that light goes, it's still nowhere close to the bottom of the abyss. Even still, as far as the light goes, the darkness of instinct dissolves, and the newly illuminated facts are immediately absorbed by science and contribute to its body of knowledge. While many people in the world might think that only the progress of physics and chemistry promotes the advancement of biology, as evolutionists, we will continue to assert that this must also be promoted, from the opposite side, by the progress of human science. Even in academia, there are many traditions, and people won't follow you right away just because your theory is correct. Therefore, we must patiently work to bring supporters to this new research perspective by any means necessary. Even today's roundtable was part of our work toward that goal.

Bee: I understand, but what a pity. I'm not here today to represent all insects, or all lowly animals, but I wish that the new light of science would soon enter our world as well. So, is there really no way to identify personality in the animals that live only by instinctive behavior?

Evolutionist: Unfortunately, as things stand, we can only identify personality where we identify culture. In doing so, however, the progress of science could be greatly advanced by admitting that anthropology and zoology must somewhat disrupt the convenient distinction between them, based on the conventional differentiation of humans and animals, and meet halfway, at least where culture is concerned, or the

same end could be achieved by simply admitting the need for cultural biology. This would be a big step in science.

In conclusion, I'd like to thank you all for being here today despite the heat. I apologize if this was difficult to follow due to my use of English terms. I hope we can have more roundtables like this when we get the chance.

THE END.

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Declarations

Conflict of Interest The authors declare that they have no conflict of interest.

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