Epicurean Children:
On interaction and “communication” between experimental animals and laboratory scientists

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Ethnography, Scientists, Experimental animals

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— *Now the parts are obvious enough to physical perception. However, with the view of observing due order and sequence and of combining rational notions with physical perception, we shall proceed to enumerate the parts: firstly, the organic, and afterwards the simple or non-composite.* (Aristotle, *Historia Animalium* 491a) [1)]

1. “Cultural Physiology” of Natural Philosopher

In the aftermath of the 3/11/2011 catastrophe, the Japanese state has evoked “*Kizuna*”(social bonds) and “*Anshin-Anzen*” (comfort and secure) society as renewed propaganda. The government and the relating agencies promote these ideas not only among social scientists but also natural social scientists in a new emerging collaborating arena for accomplishing these national aims. It is said, in the of promotion of science, that it has two aspects, one is strongly influenced by sociality like present Japan, in particular applied and social sciences, while the other is transcendent from the society, such as astronomy or high-energy physics. But our anthropological question is whether scientists can actually perform free from worldliness. Our paper demonstrates how experimental scientists make the real world with animals.

We discuss the relationship between humans and animals from the point of view that there is a sustained Japanese cultural ideology in the natural sciences, from basic academic philosophy to applied drug design pharmaceutical industries. In other words we intend to represent their "cultural physiology (*physiologie de la culture*)" of Japanese natural scientists. For this purpose, we examine neuroscience laboratories that employ cats and monkeys in a Japanese university. Generally speaking, ordinary people do not know exactly how animals are used in experiments within such laboratories. Some Japanese animal rights activists have been escalating their demands for the protection of experimental animals; they call for public action. We can see such propaganda in some of the photographic panels, containing scenes from an unknown source and found in commercial arcades across suburban Japan, that explain the "cruelty of animal experiment in hidden laboratories." Honestly speaking there exists grand moral conscious discrepancies between animal rights activists and the scientists who treat animals in laboratory.

Fig. 1 "*Dōbutsu Irē-Sai*" (memorial service for animal spirits in front of the Memorial Tower, at National Akita University, held in September 20, 2007. Cited from http://www.med.akita-u.ac.jp/~doubutu/Default/ireisai/ireisiki19/ireisiki.html)

In this paper we will discuss the hybridity between experimental neuroscientists and the animal themselves, as well as the interaction between them. This paper challenges the dichotomy between object and subject, the animals and the scientists, which are narrated into a pre-established harmony y through children's books or television programs on the quasi-national broadcast agency, NHK. According to our commonsense understanding, and regardless of the clear ethical issues surrounding research, natural scientists are thought to treat experimental animals as objects from which they extract data using various experimental instruments. We sometimes hold the stereotype that cold-blooded scientists treat experimental animals as "machines." Their only concern is to analyze data, structure the "facts," and, finally, glean "scientific truth." But we have experienced the very ordinary life of the neuroscientists who feed the caged animals, conduct experiments, analyze the data, discuss their topical issues using their own data and the previous studies, and attend their seminars. Needless to say the real ethnographic data complicates our stereotypes, and indicates that these scientists are not so coldblooded with experimental animals.

Because we take our point of view from the complete philosophical naturalism described by Phillip Descola (2006:8; 2013:179-185), we do understand the notion of "negotiation" between human being and an animal to be a metaphor, e.g. (*exampli gratia*), anthropomorphism, in the human cultural imagination not in their imagination of the animals. But we found that natural scientists do not completely treat experimental animals as material objects. Naturally we should take care in how we "use" animal. According to our juridical law and/or the code of ethics for scientists, it is strictly prohibited that we subject animals to more "pain than is necessary," that means we are treating appropriately the life of animals. Some people treat animals as pets, while the scientists treat animals as living objects, "*Iki-Mono*." We ourselves are not separated from animals in our logical or "cosmological" dichotomy between human and animal. Sometime humans are included as with animals; while at other times human are arbitrarily excluded from the category of "animals." Human beings and animals are both co-evolutionary existences (Haraway 2008) in our post-modern era; we can use the new terminology representing both categories, as "negotiable existence" between human and animal. Reflecting our human natural history, we have spent over hundreds of centuries of hunting activities during the human evolutionary process, and therefore the relationship between animal and human being is that of predator and victim and/or meat and hunter. We have also brought them into a symbiotic "domestication process," both domestication of animals and self-domestication by ourselves, and animals have given us meat, milk, skin and so on. Finally we have become intimate companions whereby animals are not only pets but also as experimental objects. In the contemporary situation, the experimental animals are potentially "invisible" even though we need them for the final test of pharmaceutical and biomedical industry and therefore scientific "progress."

We need to develop an ethnographic examination of laboratories, and the way that animals are used, in order to gain further insight into the hidden "negotiation" between animals and human beings involved in such science. We present our case study of laboratory ethnography of the neurophysiology of the vision using rats, cats and monkeys as experimental animals (Ikeda 2012). The following sections present theoretical discussions on laboratory anthropology (Chapter II), the field setting of neurophysiology (III, IV, an V), the cultural production of scientific knowledge (VI), and the mystification of the disappearance of the boundary between scientists and animals that does not appear in scientific journals (VII). The final section concludes the nature of interaction and "negotiation" between animals and scientists.

2. Neurophysiology and Cultural Anthropology

The academic discipline of neurophysiology has drastically changed undue to advances in both the behavioral sciences and new research in molecular bio-informatics. Our research interest is chiefly in "the social practice of scientists," in other words the way that scientists behave in the actual places where science is born. Our premise is that scientists can be influenced by their ordinary life or the ethos of their cultural milieu. And the scientist participates his/her game and solves the puzzle that the scientific paradigm is providing, according to the Kuhnian explanation explained later. And, as with the Kuhnian thesis (Kuhn 1996), scientists engage in the "game" of solving puzzles that their paradigm provides. In this sense, "social practice" is a synonym for the scientist's way of life.

In this present study we are challenging the classical stereotype of the cultural anthropologist as an adventurer seeking exotic native people. For historical reasons, the classical anthropologist sought the exotic 'Other' who is completely different from people in "our" culture. Such an anthropologist stresses the exotic rather than similar, focuses on how we are different rather than on what we have in common.

The neurophysiologists who appear in this ethnographic study are the "objects" of our research. They are also colleagues in the university where we are working. In general we were fostered in the same Japanese modern urban and university subculture, but in other aspects we are living in different academic milieus. We are neighbors and our lives mirror each other's. During our research period we are always trying to understand each other by talking openly, encountering that bit of difference that is always found in ordinary ethnographic work.

Here we return to our thesis of "social practice" that is reflected in the participant's sociality, even at the isolated micro-level laboratory which is ostensibly separate from the ordinary macro-level society found in much sociology of science. Our first motivation in this study is to provide a case study in the anthropology of Japanese science. We also aim to contribute to a new and an alternative social role for science studies in the Post-Science-Wars era (Sokal and Bricmont 1998) whereby the social studies of science have been criticized as useless critique for the sake of critique or as a quest for esoteric entities in science.

Because one author had previous fieldwork experience at a field laboratory for tropical ecology in Costa Rica (Ikeda 1998), this ethnography seeks to build on this experience in a neurophysiology laboratory in Japan. Needless to say there are many great pioneers in the ethnographic study of science, especially in the experimental endocrinology laboratory. Latour and Woolgar highlighted the dynamic and contingent factors that intervened in the authorized knowledge building process of constructing scientific facts (Latour and Woolgar 1986:75). There are small numbers of the ethnographic studies in Japan (Knorr-Cetina 1981; Callon 1986; Treweek 1988; Coleman 1999).

More than seventeen years before Ikeda's fieldwork in Costa Rica, he had worked for half year in a biochemistry laboratory studying circadian rhythm metabolism (Ishikawa et al. 1984). He encountered his colleague Sato who is one of the protagonists in the story of our paper. Today he is the professor of the neurophysiology laboratory. Ikeda has been consulting with Prof. Sato in order to realize this fieldwork since May 2005 when Prof. Sato was invited as lecturer for a university public seminar. He was willing to invite me as participant observer of his laboratory.

3. The Field Settings

The field site is one of numerous neuroscience laboratories in a Japanese university. The laboratory has a staff of one professor, one associate professor, one assistant professor, some postdoctoral fellows, and a number of graduate students and technicians. The laboratory is referred to as a "*Kyo-Shitsu*" (literally "classroom") in common parlance or officially "*Shō-Kōuza*," ("small chair for lecturer") the smallest institutional unit. Nevertheless the Deregulation of University Act, DUA, of the Ministry of Education, Culture, Sports, Science and Technology, MEXT, introduced at the end of March 2007, officially abolished this type of institution. Under the old regime before 2007, the nomination system for laboratories was still active so we would call this type of laboratory "Professor X's *Kenkyū-shitu*" or "*X-Ken*." In the laboratory, Dr. Hiromichi Sato, Ph. D, took his professorship chair in 1995 after transferring from the faculty of medicine of the same university. Dr. Sato had been the lecturer of the Biomedical Education Center of the same faculty. When he was promoted to professor and he became the "boss" of the neurophysiology laboratory, or "Sato-Ken," Dr. Shimegi, Ph. D, was assistant professor, and later promoted to associate professor at April 2002. By order of the DUA, this laboratory, which had been in the department of general education and acted as an autonomous independent university organization, was transferred to the faculty of medicine in April 2007. This new laboratory is officially called the "Cognitive Behavioral Science Laboratory," where they work on neurophysiological studies of the visual system of vertebrate animals. Still, the staff and neighboring faculty commonly refer to the lab "*Sato-Ken*." After working as post-doctoral fellow for two years, Dr. Naito, began to work as an assistant professor from June 2005. In addition to these three tenured staff, there were one post-doctoral fellow and four post-graduate students. The gender balance much more heavily weighted towards men; only one staff member is female. This "inconvenient truth" can be observed in many natural science laboratories in Japan.

The laboratory is funded through competitive private and governmental grants including university offered running management costs, "*Daigaku-Kiban-Kenkyūhi*" (university-basement-research-grant) or "*Kōhi*" (official costs). But, due to the recent budget cutting trends from MEXT, the university scientists are now rushing to apply for a big, competitive governmental grant called "*Kagaku-Kenkyūhi Hojyo-Kin*" or "*Kakenhi*," offered from the Grant-in-Aid for Scientific Research by the Japan Society for the Promotion of Science (JSPS). In 2012, the success rates of those grants were in the range of 17.2 to 30.0%. Trends in Research and development, R&D, expenditures as a percentage of GDP in Japan are comparatively high, 3.61% in 2006, comparing Korea 3.23%, US 2.62%, German 2.51%, France 2.12% in same year.[2)]

The most common activities at the laboratory include the maintenance of the animals in cages, a weekly seminar discussing recent publications called "*Shōdoku-Kai*" ("meeting for briefing papers" in literally meaning) or "journal club," analysis of data and of writing papers for contributing academic journals, and animal experiments. In general the journal club is a very important activity for Japanese students because they have the opportunity to discuss and explain new scientific trends and experimental methods, in Japanese, and therefore enter into "foreign advanced academic trends" in the transnational game of science (Sindermann 2001). In this laboratory every Saturday morning they discuss new topic in their academic fields for two or more hours. Research staff insist that the journal club is very useful not only for learning about new research trends but also as a pedagogic function: incorporating "young scholars" into "real academic talk." Apart from the journal club, the "*Wakate*" on "juniors" who include undergraduate students, graduate students, and post-doctoral fellows have discussions based on their reading of textbooks. Prof. Sato's laboratory, "Sato-Ken," also maintains relations at least two others neuroscience laboratories on the same campus. This voluntary academic organization holds an annual meeting and sometimes holds an *ad hoc* seminar inviting the "Ō-mono" or "big name" that has visited to Japan.

We cannot omit another important (but unofficial) member of Sato's laboratory. One undergraduate student of the faculty of engineering, Kaita-Kun (a nickname) was interested in the development of artificial visual devices for blind persons. He had participated with journal club during my research period. After having his time in animal experimentation at Sato's lab, he was able to skip the faculty grade due to his talent he had graduated. Soon after he entered a graduate school of engineering. Different from the ordinary education route from undergraduate to graduate in the same faculty of the same university, this kind of recruitment of such "bypass" students is important for insuring a diverse laboratory. The present assistant professor Dr. Naito has a similar personal history. The post-doctoral fellows from this lab are highly encouraged to get involved in initiatives with other institutions outside of the campus. This self-training process out of their own incubator is called as "*Musha-Shugyō*" (literally "vagabonding quest for becoming strong Samurai") by members.

Animal experiments are not only an ordinary part of laboratory activity, but also an important rite of initiation for newcomers. Because professors and other staff are often busy during the semester teaching classes, often the main experiments are conducted during vacation periods. For this reason, the staff refers to this season as the harvest season or "*Kaki-ire Doki*," of animal experimentation. In this season quasi-formal "junior" members are invited to participate and/or observe "official" experiments that contribute to actual academic publications (as opposed to the "educative" experiments demonstrated in the university classroom). Animal experiments are divided into two types; (i) the acute experiment, in which data are collected intensively from the treated anesthetized animal by experimental apparatus, e.g., electrode potential probe, and (ii) the chronic experiment, in which the animals are trained with some behavioral task without anesthetization, and after this habituation, data are collected periodically for a comparatively long time.

Practicing and participating in animal experiments has two social functions for the members. One is to initiate new comers and the other is to make and sustain a "community of practice." According to the theory of Legitimate Peripheral Participation, LPP, laboratory is a "community of practice" and novice participation is "situated learning" in the form of the LPP theory. The novice gradually comes to be involved in the "full participation" of expert learning (Lave and Wenger 1991). In this sense the laboratory can be a community of practice.

4. The Place and My knowledge, or My Place and the Knowledge

Dr. Sato is Ikeda's alumna of the graduate school of the medical sciences and also friend of his. They are the only two professors of their age group at the university. Therefore they are included in same "academic clan," *Dō-zoku* or *Gakubatsu*. When Ikeda talked with him to seek permission to conduct an ethnographic survey including interviews and participant observation with laboratory members, Sato guaranteed his position as a laboratory colleague. Ikeda has been interested in ethnography of the scientists for over fifteen years, and published his first ethnography of field ecologists in Costa Rica, entitled "Field Life: An Outline of the Survey on Micro-Social Activities of Tropical Ecologists" in Japanese (Ikeda 1998).

The classical anthropologists tend to eroticize natural scientists as "native people" that depend on their own "custom" or "culture." To avoid this type of exoticism anthropologists have recently taken a practical bent. Michael Gibbons' Mode theory is in this trend. According to Anglo-Saxon science studies, Gibbons (1994) specifies two modes with concern to this practical bent, "Mode 1 (one)" and "Mode 2 (two)," in scientific knowledge production. He defines the traditional or conservative scientific knowledge production processes as "Mode 1," in which the scientists objectify the material, "experimental animal" in our study, analyzes this material, and publishes findings in scientific journals. After the practical bent of the scientist, they think that scientific knowledge should be useful for solving specific problems in the real world. The latter is in "Mode 2." In the "Mode 1" sense, the anthropologist of yesterday was only interested in representing scientists as "native people," only concerned with representation without self-reflectiveness. But contemporary anthropologists in "Mode 2" seek to share their knowledge with the subject observed who wants to utilize "correct" knowledge.

Thomas Kuhn defined his "scientific paradigm" as "universally recognized scientific achievements that, for a time, provide model problems and solutions for a community of researchers" (Kuhn 1996:10). Because we depend on a Kuhnian theoretical point of view, we are interested in not only how biologists see experimental animals but also how they treat animals during their experiments according to their scientific "paradigm." In these motivations, we should note four brief scientific themes that the Sato's lab maintained.

> Stimulus properties in the primary visual cortex and their mechanism. Context dependent stimulus regulation in the neurons of the primary visual cortex. Bottom-up and Top-down informatics of the vision, and Informational representations of the body receptive field and their mechanism.

As described in Latour and Woolgar's account of the endocrinology laboratory, the staff of Sato's lab sacrifice a great deal of time reading huge bibliographies of previous reports and writing and/or rewriting their papers depending on their own experiment data. More than teaching activities, these three professors spend their major time writing their own papers but also rewriting and/or correcting other people's papers.

Even in famous Japanese national universities, there is more to academic life than the world of "publish or perish." Japanese university teaching staff divides own activities into three major parts, (1) Education, (2) Research, and (3) Administration. But today there emerges a fourth category, (4) Outreach for society, "*Shakai-Kōken*," literally "social contribution." They say that commenting and editing young researchers' papers is not only education but also the development of research activities at the same time. To publicize famously is also part of "*Shakai-Kōken*." Animal care generally can be thought of as demonstrative activity, but staff says that, in order to become good scientist, they should be good at animal care also. Professor Sato says all the activities of the laboratory are constructed for the total education of young scholars.

5. Laboratory as a Historical Entity

According to Kuhn (1996), in normal science, researchers dedicate their time to enthusiastically solving scientific puzzles. In solving these puzzles, they depend upon an epistemological framework that is the result of its own tradition in a certain historical context. It is clear that there exists a grand paradigm that is composed of smaller paradigms or sub-paradigms. In this study the grand paradigm might be the neurophysiology of the vision, which consists of sub paradigms in the "schools" as sub-divisions.

Thus the laboratory of the neurophysiology maintains some characteristics of its historical entity. The historical entity can be embodied or reified in her/his personal own experience. Dr. Sato, the counterpart in our dialogue of the scientists' stories, was not born as scientist but has become a scientist in Simone de Beauvoir's sense of on "*Ne naît pas scientifique, on le devient*" (Is not born scientist, one becomes it). We will depict the portrait of the scientists in the recent neurophysiology paradigm. Dr. Sato is a player of puzzle solving games.

The place of fostering in our story was the "Research Center of Higher Nervous System (RCHNS), the Faculty of Medicine, Osaka University," the socio-cultural space where mentors and disciples have been forging, "*Kitaeru*", each other. We will summarize the following information that we are indebted to in our writing of this paper: an extract of the description of the Neurophysiology section of the RCHNS in "The 50 years Official Chronicle of Medical Learning of the Osaka University: Basic Science Laboratories & Research Centers Section" (1978:289-294) that was written by Prof. Kitsuya Iwama, 1919-2010; the Preface of the Collected Papers which details the memories of Dr. Iwama, entitled, "From Neurophysiology to Neuroscience" edited by Dr. Takuji Kasamatsu (1985); Various interviews recorded with Dr. Sato; the web pages by Dr. Nigel Daw, the professor emeritus in ophthalmology and neurobiology at Yale University School of Medicine; and so on.

The beginning: After 1953 some core members of the Faculty of Medicine, Osaka University officially requested funding from the Ministry of Education, Science and Culture, "*Monbu-Shō*" (former of the MEXT) to establish a research institute of brain sciences to t. One of the members was Dr. Toshiyuki Kurotsu, the Nobel Prize Nominee in Physiology or Medicine of 1952, who had been the professor of the Third Department of Anatomy. The establishment of the RCHNS was in 1961, one year before of the retirement of Prof. Kurotsu. Then he had chaired the RCHNS while also being a professor of neurophysiology. One year after Prof. Iwama, the former professor of physiology of Kanazawa University, had succeeded to the professorship of Neurophysiology of the center after Prof. Kurotsu. Dr. Kitsuya Iwama, sometimes mispronounced as "Kichiya" Iwama, was born in Miyagi prefecture in 1919. He graduated from the Faculty of Medicine, Tohoku Imperial University in 1943, two years before the decline of Japanese military empire. After his graduation he decided to become a graduate student of neurophysiology under professor of physiology, Dr. Kouichi Motokawa (1903-1971), the great pioneer of brain wave research and later the President of Tohoku University, 1965-1971. He decided to get into neurophysiology because Iwama was reluctant with the "illogical" clinical medicine of the day (Kayama 2010).

Dr. Iwama recalled in later years, "Motokawa Sensei (mentor) had verbal talent for explaining complicated matters with a few crisp words in his classroom that appealed to students very much. He -- Dr. Motokawa – was always ready to discuss fresh ideas in research with us. He used to exercise fully his charm in talking to encourage young researchers in his laboratory. He loved simplicity" (cited from Kasamatsu 1985:i).

Dr. Iwama had been researching the brain waves during sleep in his Kanazawa's days, but after arriving in Osaka he had begun to study cat "activated" sleep mechanism by introducing a built-in electrode, especially the pre-synaptic supposition mechanism of the Lateral Geniculate Nucleus, LGN, inside the thalamus of the brain. It is well known that the LGN receives information signals directly from the ascending retinal ganglion cells and then radiates a direct pathway to the primary visual cortex, V1 (ví one, in pronunciation). So the Iwama's laboratory had begun to study the neurophysiology of the visual system of the brain during 1960s and 1970s.

Mr. Sato entered the master course of the medical sciences of the graduate school of Medicine of Osaka University in April 1980, when Prof. Iwama was 61 years old. Sato had just graduated at a famous private university in Japan with bachelors in experimental psychology. He had wanted to develop his carrier into neurophysiology. After being accepted to Iwama's lab, assistant professor Dr. Kayama, an anesthesiologist who had graduated at a national university in western Japan, became Sato's academic career master, "*Ōben*" in old German-Japanese jargon in Japanese medical education sub-culture. After the death of Iwama, Dr. Kayama (2010) who is the former Professor of Fukushima Medical University wrote the obituary of his beloved mentor, "*Iwama-Sensei*" (Master Iwama), in the Journal of the Physiological Society of Japan, vol. 72(7-8). Sato had first published a small article with Dr. Kayama on the electrode recodes of Superior Colliculus, SC, in the rat brain in 1982（*Jpn J Physiol* 1982, 32(6):1011-1014）. In 1982, a year before the retirement of Iwama, Sato had consented to offer becoming assistant professor of Kanazawa University where Iwama's disciple professor was working.

Some Japanese use the ironic term "[*Gaku batsu] Shokunichi Shugi"* (academic school clan) to refer to these nepotistic practices, especially for the "seven stars," the ex-Imperial Universities in post-war Japan. There were originally nine stars, nine "*Teikoku Daigaku* (Imperial Universities)", or "*Tei-Dai*," but now two in Seoul, South Korea and Taipei, Formosa have disappeared.

Anyway after two years "*Musha-Shugyō*" (the vagabonding quest to become a strong Samurai), Sato was called back to Osaka to work as an assistant professor again at the RCHNS in 1984. But Iwama had retired one year before, in 1983, the professor of the lab succeeded Dr. X who had agreed later with to abolish the research center and transfer to a new research center with more functioning educational services in 1987. Dr. X is now director of the neural plasticity research unit of one of the famous national research centers. After RCHNS was abolished, Sato had gotten a Ph.D. and took a post-doctoral position at Washington University in St. Louis, Missouri, United States. This meant he had another "*Musha-Shugyō*," for two years abroad.

There was Professor Nigel Daw's lab in Washington University. He, now professor emeritus of Yale University, was born in 1933 and got a Bachelors in 1956 and Masters in 1961 of Mathematics at Trinity Collage of Cambridge. From 1958 to 1961 he worked as a research fellow of Polaroid with the visual researcher Dr. E. H. Land and his colleagues such as Edward F. MacNichol, Jr. at the Marine Biological Laboratory, MBL, at Woods Hole, Massachusetts. They began to experiment with the retinal ganglion cells of goldfish. It is said that Land and the other staff at MBL were astonished by Daw who had constructed his hypothesis about the cell configuration of retinal ganglions of color sensitivity. Daw got his tenure position in Washington University in 1962 and worked for three decades until 1992 when he turned to Yale. His research interest was how the retinal ganglion information system treats colors and figure patterns. His research used cats, rabbits, and monkeys as experimental animals. During this period he received a Ph.D. in biophysics from Johns Hopkins University in 1967, and worked as a postdoctoral fellow in Harvard where David Hubel and Torsten Wisel were winners of the Nobel Prize in Physiology or Medicine in 1981. Daw worked with A. L. Pearlman and contributed to advance in the understanding of the mammalian visual system, especially the false belief that had cats could not perceive color. According to his thesis, cat's color perception can be possible with a combination of the antagonistic colors in the LGN cells. He discovered that this hypothesis was verified by experiments of good trained cats. After the 1970s, he also contributed to the comparative study of the visual perception of animals that were trained in the environment where there is a one-way direction of running pattern. The visual developments of eye-deprived animals were also studied.

Sato has been to Daw's lab in Washington University and became a postdoctoral fellow for two years. After two years "*Musha-Shugyō*," he came back again to the same lab of professor X mentioned before; Sato worked again in the same university. Sato was promoted to a lecturer in 1990 when he was 34 years old. At the same year, Sato's mentor in United States Dr. Daw became professor in Ophthalmology and Neurobiology at Yale University School of Medicine. Nine years later associate professor Dr. Shimegi of the Sato's lab would visit temporally and participate with Daw's lab. Mr. Shimegi graduated the graduate school of medicine, at Gunma University then got Ph.D. title in Medicine in 1991. At the same year he got the job of assistant professor of Osaka University. He had originally graduated at the faculty of education in gymnastic. He has a black belt in Judo and an M.A. in sports sciences.

Once, Sato's lab had belonged to one of the sections of the Department of Physical Education that included basic medical science for undergraduate students. One year after Dr. Shimegi arrived as assistant professor, Dr. Sato took a professorship, which was like "landing with a parachute" because the professor chair of this lab was assigned in the "territory" of the faculty of medicine. The faculty meeting had decided to assign Dr. Sato as a new professor of neurophysiology. Prof. Sato has promoted Dr. Shimegi to lecturer of his lab. Then Shimegi decided to change his research topic from gymnastic physiology to the neurophysiology of the vision. After three years of his "academic conversion," Shimegi published his first article of neuroscience in collaboration with Sato (J. Neurosci., 1999 19(22):10154).

The genesis of Sato's lab can be understood as "settler state building." After Sato arrived in the "new world" and encountered Shimegi, they cooperated mutually to develop a new department of neurophysiology. Sato had previous experience as a neurophysiologist, but Shimegi who just converted from the field of gymnastic physiology to neuroscience began at the bottom. The production of academic papers stopped for two years from 1997 to 1998 because they tried to construct Sato's lab the "fledged" research department. In these periods there was drastic change from faculty departments to graduate school in a series of "strong" national universities, especially of former imperial universities, which institutional reform style was named as "*Daigakuin-Jyūtenka*." It can be said that this institutional reform makes more disparities of budget and academic level grade than before. The Faculty of Medicine, "*Igaku-bu*," of Osaka University changed institutionally to the Graduate School of Medicine, "*Igaku-Kenkyū-ka*" in 1997. The latter institution has merged with departments of medical sciences of the same university and was changed to the Graduate School of Medical Sciences, "*Igakukei-Kenkyū-ka*" in 1998. The Sato's lab became a part of independent faculty of gymnastic education for undergraduate students, and the lab merged with the Graduate School of Medical Sciences in 2005.

Now we are back to February 2001 when Sato's ex-mentor of St. Luis, Prof. Daw of Yale spent a short time in Japan and gave a lecture at Sato's lab. In this seminar Dr. Shimegi encountered Prof. Daw and asked him to allow a short visit to Yale for animal experimentation. The motivation of Shimegi's visit was to learn the experimental techniques of Daw's lab. Sato and Shimegi wanted to introduce the methodological know-how of Daw's lab to Sato's. In terms of the collaboration with Sato and Shimegi, we have published their story of "their innocent abroad" in Japanese (Ikeda et al. 2008, Chap. 5). It is possible to see the animal experiment laboratory as an "incubate training unit" for junior scientists. After examining Shimegi's personal history in the U.S., we discovered the importance of Daw's laboratory tradition that Sato has succeeded in japan. If we examine Sato's academic success, we finally found the importance of the Iwama's lab; finally we have just discovered the great tradition of Dr. Motokawa's lab, the great incubator of neurophysiology in history of Japan. It is clear that all the personnel mentioned above are not in only one school but they share various academic currents, *Gaku-Batsu*, if we can say, participants of a certain kind of the "scientific paradigm" of "sub-paradigm"

6. Animal Experiments and Their Verification Process

The story that we detail above can be laborious for the readers who want to know briefly persons interact in animal experimentation. Nevertheless it is necessary background context for understanding the historical legitimation process of introducing animal experiments, because the treatment of animals is interrelated with the legitimation of scientific verification. In our case study the ethical legitimation of animal experimentation is rooted in the neurological physical and professional similarities with human beings (Ikeda 2012). As such, the researchers can insist on the applicability for human clinical treatments, especially for blind people and others with vision impairments.

If we do not understand this legitimation, the social situation will be open to the introduction of the opinion of radical animal rights activists who insist on complete abolishment of animal experimentation. Such activists want to liberate animals and free them from "torture. "We do not believe that animal could be treated with any kind of "torture." Stereotyped terminology, "torture," is a rhetorical expression with anthropomorphism even though the natural scientists treat animals in preparation for experiment with anesthesia. Logically thinking it is impossible to make a subject "torture" under general anesthesia. Instead of this type of unproductive controversy, we should challenge to present the ethnographic point of view to understand how the "degree" of interaction between human being and animals being for understanding the common interiority and the communication between them and us.

On September 11th, 2001, the same date as the terrorist attacks, in the Yale laboratory 110km northeast of Ground Zero, Dr. Shimegi was working on an animal experiment that would contribute to his future paper entitled, "Blockade of cyclic AMP-dependent protein kinase does not prevent the reverse ocular dominance shift in kitten visual cortex" (Shimegi et al., 2003). As mentioned previously, once a scientist begins an acute animal experiment requiring of the skull, the researchers should take care of the animal under biological surveillance and continue to collect data until death. Dr. Shimegi had started his experiment before the moment of the tragedy of the 911. The experiment condition is very sophisticated and complicated. The animal should be awakened but not give pain by general anesthesia and muscle relaxant with an artificial respirator. Because the eyes of the animal should be open but not dried, they put contact lenses and eye lotion on the animal. After the experiment, the researcher immediately undertakes the euthanasia process so as not to prolong any "useless pain." The dead body is treated very kindly because the researcher needs a whole brain substance for histological analysis (Histology is a sub-discipline of anatomy). The brain will be treated in staining for histological data collection. Nowadays the experimental animals are very expensive because of the genetic and medical qualitative conditioning. Before the experiment, the animal should be in not only good environmental condition but also medical well-being.

In summary the animals should be treated carefully in all periods of the experiment. The researchers observe carefully not only the neural level but also of whole body because it provides important data for the experiment. Sometimes the animal rights activists stereotyped the scientist as a "diabolical sadist." But according to our findings, the scientist has a "normal mind" and/or even has a "warm heart" in a different sense from ordinary people. Consequently the problem is how to represent the normal scientists' mind-set maintains.

Occasionally we are easily led astray into the temptation to represent "our" scientists who use experimental animal as "our" native people in culturalist sense. But we are hesitant to eroticize the scientists because we, as researchers of researchers, cannot distinguish our exotic topic from their ordinary one. In any manner, they care for the animal's heart and soul.

The scientist's attitude toward animals is completely different from a pet lover's blind love. The latter sense comes from the person's own anthropocentrism and anthropomorphism. We sometime can observe the ultimate care spirit without humanistic feeling in a medical setting, e.g., the brain surgery operation room. Observing the fine operation of cat's eye for making artificial exotropia (divergent strabismus) cutting the medial rectus muscle, the Sato's personal writing on date July 20, 2001 says as follows.

The animal [cat] is generally anesthetized and operated under artificial respiration conditions. Always, the whole animal body is monitored by electrocardiogram, arterial oximetry, expiratory carbon dioxide gas monitor, thermometer, and respiration rate counter, and so on. In this time Dr. S.G. [pseudonym, a post-doctoral fellow of Prof. Daw's lab] was "terrifically" sedulous and operated prudentially step by step. The operating room is sterilely clean. The numerous procedures are rigidly determined that I could not imagine which step had been the last one. Lastly Shimegi might have done this type of animal operation, but he could not master immediately when he encountered with this marvelous operation because he had been experimenting for rats only."[3)]

The problem and its context are described below; it is well known that neural activity can recover functionally even after some part of the brain structure coincident with that functional role has been damaged. Some data suggests that functional compensation can be based on making new neural networks in the brain. It is possible that the alternative structural neural network was constructed to compensate for the damaged circuit. It is reasonable to assume that this neural constructing process might promote more efficiency for neural networks that are more needed and less efficiency for networks that are less needed. This biological adaptive process is known as "neural plasticity."

Neural plasticity can be observed in the mammalian developing brain. It is said that the role of the glutamate receptor, which is called NMDA receptor coupling with glutamate as excitatory neurotransmitter, is very important. NMDA is an acronym for N-methyl-D-aspartate, and this type of receptor has high affinity with NMDA. If NMDA receptors existing around synaptic junction combine with glutamate, with the excitation of membrane potential the calcium ion flows into inside of cell as primer of the activation of enzymic system. The enzymic system, e.g. Protein kinase A (PKA), is activated and then the chemical synthesis begins.

They, Shimegi with Daw's group, wanted to observe both the development of neural circuits in typical plasticity and the neural action potential under the condition by micro pumping injection of both of the PKA. The PKA inhibits muscimol that inactivates neural activities for a while by blocking enzymic function. They focused if the reverse ocular dominance shift occurs under the dose of PKA. The reverse ocular dominance shift occurs normally under a dose of muscimol. (The ocular dominance will be explained two paragraphs later).

Why were they interested in this topic? If we want to know, we should understand Donald Hebb's law on neural plasticity and theoretical patch of the Hebbian theory that is called "covariance theory." Hebb's law is a kind of hypothesis that explains the plasticity using three points of view; (1) Cooperation, that synaptic plasticity can be formed under constant stimuli, (2) Input specific, that the significant synapse can be observed while the unrelated one cannot, (3) Association, that even weak stimulus with helping by other stimulus can make plasticity. The theoretical value of the Hebbian theory is the covariance theory, which explains the relations between plasticity and continuous reinforcing stimuli that depends on neural reinforcement of series of stimuli synapse by synapse. Needless to say they are not only interested in theoretical explanation but also in the molecular mechanism of the reverse ocular dominance shift when the neural plasticity phenomena occur.

For verifying their hypothesis, they used the artificial intervention for the reverse ocular dominance shift inside of the animal brain. Now we need more the knowledge of the difference between the ocular dominance shift and the reverse one. What is ocular dominance? – It is the tendency to prefer visual input from one eye to the other. The ocular dominance of neurons in the visual cortex of developmental critical period mammalian can be shifted by artificial operation, e.g., monocular deprivation (MD) or monocular inactivation (MI) by lid closure. This type of orientation process is not always singular but rather has alternatives. Normally the neural response has lost from the visual deprived eye's side, finally almost neurons respond to normal side in the developmental critical period animals. But in case of artificial inactivation of visual cortex, neurons have tended to response to more deprived eye side than normal one. The artificial inactivation of visual cortex can be made from the inactivation of neural inhibition even if there exists strong excitatory inputs to visual cortex. One example of the inactivation of neural inhibition is the continuous micro-infusion of the muscimol, one of receptor agonists of inhibitory transmitter the gamma-amino butyric acid, GABA, into the visual cortex. The combination between the inactivation of visual cortex and monocular deprivation makes the strange neural shift that looks like a functionally unnatural orientation, so there is shift from in the dominant eye toward the deprived one. This phenomenon is called reverse ocular dominance shift, as opposed to a normal ocular dominance shift.

Both normal and reverse ocular dominance shifts are phenomena that occur in the visual cortex after the retinal inputs are deprived at an ocular level. In addition to the monocular inactivation experiment, now they have another experimental method that investigates the two types of ocular dominance shifts through an operation based on artificially strabismus (squint). This experiment has pragmatic benefits not only for acquiring new knowledge of the mammalian visual system but also for surgery and its prescription for human squint patients. There are two major incentives for experimental scientists; (1) how the abnormal (strabismus) visual inputs affect to neural plasticity, and (2) what kinds of molecular mechanism will be selected. And they are interested in the timing of the ocular dominance shift in the visual cortex correlating the operation for making artificial strabismus. So they should make the experimental roadmap of the combination operation of strabismus, observation of animal habituation process, and timing of experiment of the animals. Because of the terminologies of these experiments, e.g., monocular deprivation (MD) or monocular inactivation (MI), and the emotional reaction such names may elicit, it is understandable that they tend to use the acronyms MD or MI. But from the insiders' point of view they "sincerely" care for experimental animals

Shimegi who took the initiative for the experiment will be mentioned below. We will take our interpretation by retrospective perspective. Reading the Shimegi's first authored paper published two years after their experiments, we confront the two facts. We shall call, "Fact A" a macro level observation and "Fact B" a micro neurophysiological level observation. They have been constructed independently by their own data.

(Fact A)

Regardless of whether the Rp-8-Cl-cAMPS that inhibit PKA effect exists or is found, the normal ocular dominance shift occurs. Then the question is if the reverse ocular dominance shift is inhibited by the dose of the PKA inhibitor (Rp-8-Cl-cAMPS). The reverse ocular dominance shift is found in monocular cats if its cortex is continuously injected with muscimol that stimulates the GABA receptor that produces inactivation of the visual cortex. This question can be solved if the infusion of the PKA inhibitor is added continuously to the experiment mentioned above at the same time as Shimegi was planning. The result of this experiment is that the PKA inhibitor (Rp-8-Cl-cAMPS) does not prevent the reverse ocular dominance shift. Even if the Rp-8-Cl-cAMPS inhibit generally the protein kinase A (PKA) activity, the reverse ocular dominance shift occurs. It suggests that the PKA is not necessary for the reverse ocular dominance shift. This suggests the hypothesis that a different molecular mechanism between the normal ocular dominance shift and reverse one in the visual cortex can be observed in some critical period of the cat brain development. And it is possible that the normal ocular dominance shift occurs in the intracellular signal transduction system mediating with PKA on the one hand. But the reverse ocular dominance shift does not occur in a similar system.

(Fact B)

The reverse ocular dominance shift will occur with or without the existence of the Rp-8-Cl-cAMPS that blocks the function of PKA. The next problem issue centers on the neural activities inside the various layers of the visual cortex. There are six layers, from I to VI in the cat visual cortex. There is a strong tendency of ocular dominance shift in the layer IV that receives direct inputs from lateral geniculate nucleus (LGN). In the cat brain the visual inputs from both right and left eyes converge to a single neuron in layer IV of Visual Cortex (V1). The neuron begins to acquire the sensibility of both eyes inputs. But before this level of development the inputs from each eye are treated and transmitted separately from each other depending upon ocular dominant neurons. According to the data indicating that ocular dominance shift occurs mainly in layer IV, it is possible that the transformation of thalamocortical synapses in which the neurons project from LGN into V1 area is a key phenomenon for the neural basis of the ocular dominance shift. At the same occasion there is information flow through layer IV to layer II and III, layer V to layer VI successively. In this process the neural information according for strong selective ocular dominance shift with not only the deprived eye but also the normal one will converge, the reaction selectivity for deprived eye could weaken.

Shimegi concluded following below; (1) The activation of PKA is not necessary in the reverse ocular dominance shift process in visual cortex, and (2) The molecular mechanism of ocular dominance plasticity by eye deprivation is not a simple intracellular signal transduction but multiple. At least the normal ocular dominance shift that evokes in eye deprivation under the normal visual cortex's condition is not needed with PKA activation. Traverse ocular dominance does not depend on PKA but rather might depend on other molecular mechanisms.

We have reviewed the inside story of the Shimegi's first author paper in depth. At this point, we may wonder what the importance of this paper is for our overarching story. Can we understand it if we might study for both more his personal data and neurobiology in general? We think we cannot. We need basic information that can construct certain images of the scientific paradigm. we therefore seek to understand Shimiegi's paper in relation to Daw's text "Visual Development" (2006). Shimegi's thesis even exists in the Hebbian paradigm sphere because he does not intend to disputers Hebbs law but rather support and/or reinforce it. To understand Shimegi's paper requires not only collecting the scientific information on the topic but also knowing how they struggle with a series of enigmas and try to resolve their "puzzle." Because we are not specialists in this area, we take a shortcut method only to understand in the narrow actual scheme that they confront. This kind of study resembles a problem-based leaning (PBL) whereby the students might seek a solution and alternative according single case study under the limited time and knowledge resource. Bu this method cannot give us the entire picture, a "holistic" view of their total activity. Like a long-term ethnographer with "native" people, we have to enter endless conversation with many neuroscientists.

7. "Care" in situation of the hybrid

In this section, we describe the hybrid entity between a human being and an experimental animal. We cannot use dichotomize between human and animal. In such a dichotomy, the human being can be interpreted as subject and the animal can be interpreted as object. We reconsider the behavior whereby neuroscientists collect data on an animal by an electrode infused in the brain. There is a fundamental antinomy when referring to "visual recognition in awakening condition" under anesthesia. Neuroscientists explain that an animal body can be in a state between "not sleeping under general anesthesia" and "awakening with conscious but without feeling pain." This is a state that we cannot imagine according to our own experiences. While not like a technical dilemma, it is a philosophical one. Neuroscientists overcome it logically by using a very sophisticated detective machine and their own experience with animals. It can be said that practical wisdom, *phronesis* in Greek, is useful for understanding how neuroscientists take care for experimental animals.

Before concluding the nature of care for animal by neuroscientist we begin to indicate the discrepancy between the written description in a scientific journal and the actual behavior of scientists. In an academic article there is "method [of experiments]" section between the outline and the data sections. In general this "method" section details the methods of anesthesia and surgical operation, the presentation method for visual stimuli, the methods for detecting types of sensory neuron, methods of dissection, and the method of data analysis including mathematical theories and computer program packages. The citation of "Surgical preparation and recording" mentioned below is cited from the Journal of Neurophysiology issue from August 2008;

> "We recorded extracellularly from V1 and/or V2 of eight anesthetized (sufentanil citrate, 4–12 μg-kg [to minus first power] -h-[to minus first power]) and paralyzed (vecuronium bromide, 0.1 μg-kg-1 h-[to minus first power]) macaque monkeys (*Macaca fascicularis*). All procedures conformed to the guidelines of the University of Utah Institutional Animal Care and Use Committee. Animals were artificially respirated with a 30:70 mixture of O2 and N2O. The electrocardiogram was continuously monitored, end-tidal CO2 was maintained at 30–33 mmHg, rectal temperature was near 37°C, and blood oxygenation was near 100%. The pupils were dilated with topical atropine and the corneas protected with rigid gas-permeable contact lenses. The locations of the foveae were plotted at the beginning of the experiment and periodically thereafter, using a reversible ophthalmoscope. Supplementary lenses were used to focus the eyes on the display screen.[new paragraph] Single-unit recordings were made with epoxylite-coated tungsten microelectrodes (4–6 MΩ; FHC, Bowdoin, ME). Spikes were conventionally amplified, filtered, and sampled at 22 kHz by a dualprocessor G5 Power Macintosh computer running custom software (EXPO), kindly donated to us by Dr. Peter Lennie. Spikes were displayed on a monitor and templates for discriminating spikes were constructed by averaging multiple traces. The timing of waveforms that matched the templates was recorded with an accuracy of 0.1 ms. (Note, -1 is changed as [to minus first power])"(Shushruth et al. 2009:2070).

When I asked to Shimegi on the contents of this method, he said that "nobody could make" a the same successful experiment based on these sections because it says "nothing" about the "actual and detailed experiment." In the laboratory there are a range of daily practices and complicated facts in how they anesthetized the animal, how they put out the cage to laboratory, how they weigh the animal, how they operated the respirator, how they calculated the volume of muscle relaxant, injected it, used the stereotaxic instrument, did the craniotomy operation, and injected delicately the electrode probe for detecting "cites" in the brain. These are monotonous routine procedures but they cautiously prepared each step to avoid any accidents with the measuring instruments that could result in a critical condition for the animal. Sometimes they call senior researcher in case of emergency. But nobody can predict the animal's health condition and nobody can escape it. Apprentices should learn from senior researcher how accidents occur. This learning process of the on-the-job training (OJT) is very similar to legitimate peripheral participation (LPP) process learning in neuroscience laboratory as community of practice (Lave and Wenger 1991)

Scientist's attitude toward animals can be understood as "thoughtful care for experimental animals" because we can observe the seamless and sophisticated procedure of bodily technique. We take one example here, "the collecting biophysical data without pain" in the neuroscience of the vision. In this experimental method, the word anesthesia means physiological control. The animal was anesthetized in two ways, intravenously and from a respirator. On the one hand, if too much anesthetic is applied the animal has a disturbance of "consciousness" and the scientist cannot obtain "good" data from the animal. On the other hand, if not enough anesthetic is applied it will affect the metabolism of the "research object" (i.e. the experimental animal), and the researcher will detect various biological disturbances such as elevated blood pressure, increased heart rate and spontaneous neural responses apart from visual stimuli. Such results indicate that the animal feels "pain." In the case of these biological disturbances, the researcher stops collecting data. He tests how the anesthetization is going. And he monitors and checks biological and clinical data from animal body, even by simply pinching the skin of the animal to evoke "pain." At the same time, the researcher gently strokes the animal body as if he prays for the care of the animal fixed in its stereotaxic instrument. Needless to say we cannot know for certain how he feels toward an animal, but it does seem that he has compassion for animal beyond the relationship between experimental subject and object. Clearly he sought success in his experiment but he also confronted the obstacles when performing it. At that time he could separate his mind from animal as object. But when he confronted the animal's difficulty he transgressed easily the boundary between object and subject. All his motivations were oriented to the success of his experiment that explains why he cared gently with animal. Because he had his own pragmatic reason, he should recover with all his heart's and mind's strength. That is the reason why we suggest there is a hybrid entity between researcher and animal such that the researcher's care of the animal body is as if he is caring for his own body.

8. Concluding Remarks

It seems there is a difference between the anesthetic control of an animal and the efficient collection of neurophysiological data because we imagine that anesthetization is of secondary importance. It is simply an assistive technology to remove the "pain" for human surgical operation. But in this case the removal of the "pain" that the animal feels while keeping it awake and conscious is very important. In the animal experiment, anesthetic control is a key factor for success. Shimegi said this importance mentioned below,

> "(A Japanese famous) neurophysiologist Prof. E (pseudonym) is one of collaborators of Prof. Sato, has mastered the perfect anesthetize techniques on cat experiments, of course! But he confronted the troubles to obtain the datum, never! for two years after arriving at his new university post, even he had transferred the same experimental machine set.. So there must be subtle differences in the complete same condition of the same experiment. It's a very 'delicate' thing!"

Back to the tradition on history of science and technology, the care techniques for experimental animals mentioned above is in a kind of genre of navigation or clinical technique whose characteristics are represented as conjecture or guesswork, contrasting with strict theoretical science. This is troublesome work that resembles the medical practice of the clinic. As Hippocrates had said, "I think we ought to admire the discoveries as the work, not of chance, but of inquiry rightly and correctly conducted" (Hippocrates 1957[1923]:32)[4]. In this time we change the perspective of the relationship between human being and animal, from the our new point of view of the hybrid entity to "interactive or negotiable agents."

Today's animal liberation theorists (e.g., Singer 2009) have not taken a kind of animal perspective position. Animal liberation is one of the key issues for talking about animal rights not only for lay activists but also for scientists. Sometimes this thinking is one version of philosophical utilitarianism. From a utilitarian perspective, they suggest the possibility of using of a "person" with mental disabilities instead of an "animal" based on the reasoning that the animal may feel more pain than the person. But utilitarian thought has another aspect for acceptance of animal experimentation that gives human welfare a higher priority than animal rights. The utilitarian main question has if the animal could suffer more than reason and talk. Jeremy Bentham described in 1823;

> "The day may come, when the rest of the animal creation may acquire those rights which never could have been withheld from them but by the hand of tyranny....a full-grown horse or dog, is beyond comparison a more rational, as well as a more conversable animal, than an infant of a day or a week or even a month, old. But suppose the case were otherwise, what would it avail? The question is not, Can they reason? Nor, can they talk? But, can they suffer?"[5].

The lawyers have taken great pain to control and not cause unnecessary suffering in animal experiments. In Japan we have the "Act on Welfare and Management of Animals" (Law number: Act No. 105 of 1973) comparing with the "Animals (Scientific Procedures) Act," 1986 in U.K. and the "Animal Welfare Act" (Laboratory Animal Welfare Act of 1966, P.L. 89-544) in U.S.A. The Japanese act says in the section on "Method to Be Applied, Subsequent Measures, etc. in the Case of Providing Animals for Scientific Use":

> "Article 41 When providing animals for use in education, testing and research or the manufacture of biological preparations, or for any other scientific use, consideration shall be given to the appropriate use of such animals by such means as using alternative methods to that of the use of animals as much as possible and reducing the number of animals provided for such use as much as possible, within the extent that the purpose of the scientific use can be attained...(2) In the case where an animal is provided for a scientific use, a method that minimizes the pain and distress to the animal as much as possible shall be used, within the limit necessary for such use. (3) In the case where an animal has fallen into a state from which recovery is unlikely after being provided for a scientific use, the person who provided the animal for such scientific use shall immediately dispose of said animal by a method that minimizes pain and distress as much as possible."[6]

These laws were made by human beings and are not constructed for facilitating communication with animals. These laws represent the rules and norms of human beings as the patrons of animals. In this jurisprudence context there is no opportunity for negotiation between human being and animal. But if we relativize our own anthropocentric (homocentric) perspectivism and steer our perspective to the orientation of a hybrid entity between experimental animal and researcher under the human care object, we can observe that the scientists take not only the naturalism of the

Fig. 2 "*Jikken-Dōbutsu Irē-hi*" (memorial tower for experimental animal' s spirits) The inscription was written by Dr.Taizō Ushiba, 1913-2003, Professor Emeritus of faculty of Medicine, Keiō-Gijyuku University, Tokyo. Cited from http://bit.ly/1bug4Qa

"modes of identification" of ontological relations (Descola 2006:2; Viveiros de Castro 1998). Even if it remains in anthropocentrism, Paul Nadasdy's "the gift in the animal" is one of alternative interpretation of experimental animals (Nadasdy 2007). If we accept Nadasdy's hypothesis of "the gift in the animal," we can easily understand how the Japanese scientists who use animal as "sacrifice" attend the memorial service for the experimental animal spirits in front of the stone monument, inscribed "*Dōbutsu Irē-tō*" (memorial tower for animal spirits), once a year.

Talking of animal experiment and sacrifice, Japanese colleagues seem hesitant about "this kind of thing" and are concerned about protection from "animal rights activists." The former attitude comes from Buddhist and/or animist *ethos*, the latter comes from actual administrative sense of human (not animal) rights. Japanese scientists tend to explain to laymen the significance of animal experiments. Animals are sometimes represented as master/teacher, bestowing the wisdom of the "nature." In such a schema, the scientist is a disciple who is taught by animals. We note that that this cultural image on the relationship between animal and human being is completely different from the image of Kluane people of the Southwest Yukon, the life gift giver and taker (Nadasdy 2007:34-37). Also the Japanese image of the relationship between animal and scientist is different from Western image, between the object and the subject of the experiment. Here we do not insist on a cosmological difference between Japanese and Western scientific epistemologies of the type that have been popularized in various comparative theories in Japan. But we highlight the common characteristic on the relationship between master/teacher and disciple in Japan and Western world.

In the laboratory context, the relationship between researcher and animal can be interpreted as assigned between "care giver" and "care taker." But at the same time the animal gives the wisdom of the nature to researcher. As such, the relations change to those between teacher (animal) and disciple (researcher). Symbolically if the participants will achieve success in the experiment, both wisdom giver and wisdom taker communicate frankly and exchange wisdom by the grace of nature. This relationship corresponds to a Greek concept, "*Parrhesia*," that means "speak openly each other" or the transmission of technology. It is said that ancient Greek natural philosopher Epicurus suggested you do not say the truth depending on popular opinion but tell what you believe as oracle, Foucault once cited as;

> "In investigation nature I would prefer to speak openly and like an oracle to give answers serviceable to all mankind, even though no one should understand me, rather than no conform to popular opinions and so win the praise freely scattered by the mob" — Epicurus, in Fragment one.[7].

Clearly it is very difficult to find out the point in common of interiority of between human and animal that native specialists as shamans elaborate in animistic society. But modern scientific fiction proposes the common similarity of biological physicality between animal and human. In this conviction the scientist can extrapolate the animal fact to human one especially in neural calculation in their brain. The scientists organize the research team as micro society and they firstly communicate with animals and then secondarily communicate with humans of the other team. We cannot determine the actual Parrhesia relationship in which member can "speak openly each other" and transmit of certain kind of practical knowledge without participant-observation in the perfect air-conditioned and complete shielded laboratory.

> — Nature proceeds little by little from things lifeless to animal life in such a way that it is impossible to determine the exact line of demarcation, nor on which side thereof an intermediate form should lie. (Aristotle, *Historia Animalium* 588b)[8]

Notes

1) Aristotle, *Historia Animalium* 491a The History of Animals, Translated by D'Arcy Wentworth Thompson http://classics.mit.edu/Aristotle/history_anim.8.viii.html
2) Web pages on the analysis on the Grant-in-Aid for Scientific Research. http://www.jsps.go.jp/j-grantsinaid/27_kdata/ 9, 2013(last viewed in July 10, 2013)
3) Translated from Japanese (Ikeda 2008:48).
4) Hippocrates 1957[1923]:32: Ancient Medicine, Hippocrates, vol.1, Translated by W.H.S. Jones, The Loeb classical library, Harvard University Press., 1957.
5) Bentham 1823 chapter 17, footnote #122 - Bentham, Jeremy. Introduction to the Principles of Morals and Legislation, second edition, 1823, chapter 17, footnote #122. http://www.econlib.org/library/Bentham/bnthPML18.html (last viewed in July 10, 2013)
6) "Act on Welfare and Management of Animals" (Law number: Act No. 105 of 1973) (source: http://www.japaneselawtranslation.go.jp/law/detail/?id=61&vm=04&re=01&new=1)(last viewed in July 10, 2013)
7) Epicurus, in "The stoic and Epicurean philosophers: The complete extent writing of Epicurus,

Epictetus, Lucretius, Marcus Aurelius." Whitney J. Oates. New York: Modern Library, p.41, 1940. See also "Discourse and Truth: The Problematization of Parrhesia(six lectures given by Michel Foucault at Berkeley, Oct-Nov. 1983)," downloaded from http://foucault.info/downloads/discourseandtruth.doc, (last viewed in July 8, 2013)

8) Aristotle, *Historia Animalium* 588bThe History of Animals, Translated by D'Arcy Wentworth Thompson http://classics.mit.edu/Aristotle/history_anim.8.viii.html

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