

## **Japanese Studies on Anomalous Phenomena in the 1990s**

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Throughout the 1990s, scientific studies dealing with anomalous phenomena have been actively pursued in Japan following a nation-wide rise in interest in supernatural phenomena and *qigong*. Television programs introduced claimed training methods for the development of psi in the early 1990s. In 1991, another TV series dealt with near-death experiences. Best-selling books about paranormal phenomena apparently caused by Sathya Sai Baba appeared in 1993, and there was a gradual change in social demands for alternative medical care. Orthodox scientists, who were expanding their professional territories to include even the parapsychological domain, promoted research activities. At the same time, on the other hand, skeptical and cautious attitudes developed nationally, possibly brought on by the unprecedented crimes of not a few members of AUM Shinrikyo, a religious cult, and by fraudulent healers as well.

Articles or chapters of books which depicted parapsychological studies in Japan had already been published in English as well as in Japanese. Among these were volumes by Otani (1960, 1967, 1973), Shepard (1984), McClenon (1989), and Berger and Berger (1991). One of us (Kokubo, 1998) recently published a paper on the history of Japanese parapsychology from the mid-1940s on, including the academic activities of research groups in the 1990s. The present paper deals more extensively with Japanese studies either published in scientific journals or presented at professional conferences in the 1990s. We believe that

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parapsychology should be an interdisciplinary field, with research conducted across many branches of science. Therefore, scientific studies on anomalous phenomena by orthodox scientists are also reported here, albeit few of these scientists would probably consider their own work to be parapsychological.

## Research Movements in the 1990s and Their Background

### *General Situation*

In the 1990s, scientists working in orthodox disciplines began to study anomalous phenomena much more actively and positively than before, including those phenomena ordinarily studied by parapsychologists, which were long ignored by the mainstream. In recent religious and anthropological studies, the role of the paranormal in shamanism, *Chinkon* practices in *Shintoism*, and accounts of NDEs, have come to be positively reconsidered. In social-psychological studies, so-called occult movements have come to be regarded as less exceptional, and rather as the inevitable outgrowth of the development of modern society. Quite a few professionals in medicine, physics, engineering, and chemistry have started to study anomalous effects of *qigong*. Several physicists, aiming at a Tusconian approach to the problem of consciousness,<sup>1</sup> have attempted to explain paranormal phenomena from the viewpoint of the physics of consciousness.

Although the above studies do not always presuppose the existence of psi, at least in part they seem to fulfill the following prediction made by Dr. Ian Stevenson of the Division of Personality Studies at the University of Virginia: "... new investigators with the new ideas ... will come from among well-trained scientists of recognized disciplines ... [and their] curiosity will arouse their interest in the study of paranormal phenomena" (Stevenson, 1988, p. 315). The general situation may imply that contemporary academic communities have become more tolerant than ever of such studies, and they do not suppress these researchers solely on the grounds that they are working with those phenomena. This tendency can also be seen in the establishment of some new laboratories for psi research, and in the founding of several academic societies which cover such anomalous phenomena as *qigong* and psi. In 1991, the Society for Mind-Body Science and the ESPER Laboratory (closed in 1998) were founded in Japan. In 1995, the International Society of Life

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1. For more information on the Tuscon conferences on consciousness, see the following url: <http://www.consciousness.arizona.edu>.

Information Science was established. Table 1 shows the characteristics of the three academic societies which publish their own peer-reviewed journals.

A new movement towards absorbing the study of anomalous phenomena into established branches of science was also observed at the end of 1990s, in the favorable situation created by the rise of a national interest in complementary, alternative, and traditional medicines, applied fields which could contain psi as one of their basic research subjects along with external-*qi* therapy and the mind-body problem. This movement has mainly been stimulated and accelerated by information about a gradual increase in the utilization of therapeutic touch (Krieger, 1979) in hospitals in the USA, and by the promising evolution of the Office of Alternative Medicine into the National Center for Complementary and Alternative Medicine at the National Institutes of Health there. We believe the movement in Japan towards an openness to research of some paranormal phenomena in established disciplines of science will continue for the time being.

On the other hand, skeptics have also become more and more active, and as a matter of course, the largest skeptical society in Japan. The organization, the Japan Skeptics, is affiliated with the CSICOP (the Committee for the Scientific Investigation of the Claims of the Paranormal), was established in 1991. Skeptics have been making efforts to demonstrate through their publications and TV shows, possible means of committing fraud when producing “so-called paranormal phenomena.”

### *Qigong Research*

Among experimental studies on paranormal phenomena carried out in the 1990s, the most prominent were those by *qigong* researchers who had just arrived on the scene in Japan. In the usual method of *qigong* training, a trainee tries to imagine the flow of *qi* (or *ki*) throughout his or her body, and to control it. Imaged *qi* is called “internal *qi*” when it circulates in the body and it is called “external *qi*” (or *waiqi*) when elicited outside the body. *Qigong* research is divided into two different aspects: an approach to health science involving mainly internal *qi*, and research into anomalous effects caused chiefly by external *qi*. The former has been accepted publicly more easily, so that many researchers have been disposed to study *qigong* exclusively from this viewpoint. The latter, focusing on anomalous effects including treatment by external *qi* and the detection of anomalous signals with physical and/or chemical sensors, can be considered to be in actuality psi or bio-PK research (Braud & Schlitz, 1991; Solvfin, 1984). *Qigong* researchers have been making

Table 1.  
Academic Societies Publishing Peer-Reviewed Journals

Name of Association	Year of Establishment	Speciality	Number of Members	Name of Journal	Issues per Year	Language
Japanese Society for Parapsychology (JSP)	1968	Parapsychology	About 100	<i>Japanese Journal of Parapsychology</i>	2	Japanese or English
Society for Mind-Body Science (SMBM)	1991	Parapsychology and <i>Qigong</i> , among other things	About 600	<i>Journal of Mind-Body Science</i>	1 or 2	Japanese or English
International Society of Life Information Science (ISLIS)	1995	Parapsychology and <i>Qigong</i> , among other things	About 150	<i>Journal of International Society of Life Information Science</i>	2	English with Japanese translation

efforts to study these phenomena by using various electronic instruments to search for their principles and mechanisms; and such activities may throw new light onto the understanding of psi in the future. The theory of *qi* has not yet been established, although some theorists have speculated that *qi* must be something substantial, or that *qi* must be a complex phenomenon involving psychological factors.

Most *qigong* researchers in Japan are not well acquainted with parapsychology, nor conversely, are most Japanese parapsychologists acquainted with *qigong* research. After the introduction of *qigong* research into Japan, it was misidentified with psi research for a time. This was probably because anomalous effects due to external *qi* were subject to exaggerated claims. Recently, such misidentification has been observed less often; but still, some scientists do not discriminate *qigong* from psi in their articles. In these cases, three possible factors may be involved, as follows:

1. *Definition of qigong masters.* In order to gain public acceptance, experimenters often purposefully designate psychics as *qigong* masters in their publications, and some psychics habitually call themselves *qigong* masters.
2. *Influence from Chinese thought towards somatic science.* Chinese somatic science assumes that *qi* has a basis in common with psi, and that *qigong* and psi are essentially inseparable from each other because both exist along the same spectrum of *qi*.
3. *Extension of the territories of orthodox science.* The frontiers of orthodox science have been duly extended to include these paranormal phenomena.

Factors 2 and 3 are reminiscent of the current stance taken by some parapsychologists who prefer the blanket term “anomalous phenomena,” and who place psi somewhere along a spectrum that has “normal” at one end and “paranormal” at the other. In other words, these scientists seem to believe that working in a wider framework is more appropriate than working restrictedly in the parapsychological domain. This attitude can be properly illustrated by the introduction of the term “anomalous somatic functions” which they prefer to the term psi.

### Research in the 1990s

In this section, research conducted in the 1990s is described. We have selected a number of distinctive studies which best illustrate the state of the art of Japanese investigations into anomalous phenomena.

*Case Studies*

Onodera (1997), a psychologist at Tokai Women's Junior College, investigated in India the claimed phenomenon in which amrita<sup>2</sup> flowed out of a pendant with a photograph of Sathya Sai Baba mounted in it (Haraldsson, 1989, pp. 19-20), and purported predictions were made through the so-called "leaves of Agastya." No liquid effusion phenomenon could be confirmed, although an examination of the pendant was made with the naked eye. Unfortunately, Onodera could not examine it more rigorously, because the pendant's owner declined his request. A chemical analysis of a sample of the amrita revealed that its chief ingredient was sucrose. As to the "leaves predictions," Onodera felt that this was accomplished through a kind of fortune-telling which depended on mental tricks.

Nagato Azuma, an ophthalmologist, investigated paranormal phenomena from the standpoint of psi-in-process (Giesler, 1984) in the mid-1980s. His investigations included the study of anomalous modes of folk medicine and other paranormal phenomena observed in Brazil. His findings were published in a book co-authored with anthropologist Patrick Giesler (Azuma & Giesler, 1995). Their book is a systematic and comprehensive contribution, which contains descriptions of: the cultural and religious backgrounds of Brazilian folk medicine; the developmental processes of healers; investigations into case studies of individuals whose ailments were treated by psychic healing; cases of claimed memories of previous lives; theoretical considerations of healing mechanisms; and even a comparison of Brazilian healing practices so-called psychic healing observed in the Philippines (Azuma & Stevenson, 1987).

Among other studies are a series of investigations by one of us (Kokubo 1995a, 1995b) into recurrent spontaneous anomalous lights (RSALs). Anomalous lights have been frequently witnessed and photographed in the Yakumo-cho area, Hokkaido. Research revealed, however, that the great majority of these lights could be explained away as misperceptions of, or misidentifications with, artificial lights or mirages (Kokubo, 1995a). In the second investigation, in which all the witnesses were members of a particular family, several attempts were made to capture the RSALs on video and still film with a little success (Kokubo, 1995b).

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2. Amrita is a sweet mucus that some believe appears by paranormal means.

### **Historical, Philosophical, Religious, and Social Psychological Studies**

Shimidzu (1996, 1997), a scientific writer, who surveyed the history of traditional Japanese palm therapies, including laying-on-of-hands, found that the techniques of *Reijutsu* had spread overseas. *Reijutsu* is a kind of modern folk religion which became tremendously popular in Japan in the first half of this century. According to Shimidzu (1996), external *qi* therapy in modern China has only a relatively short history, and the techniques practiced in *Taireidou*, a sect of *Reijutsu* which was popular in Japan in the Taishô era (1912-1926), may have influenced the formation of techniques for external *qi* therapy. One of the reasons to believe this is that Morihira Tanaka, an advocate and a practitioner of *Taireidou*, visited Mongolia in 1911 and both demonstrated and taught the *Reijutsu* techniques there (Imura, 1984).

A professor of philosophy at Kyoto University (Becker, 1992b) has also studied religious or faith healing in general, including the laying-on-of-hands. Becker examined various reported studies over a fifty-year period in which three different types of healing techniques were used: (1) Laying-on-of-hands; (2) Charismatic or shamanistic healing without touch; and (3) Situations in which the patient was absent or unaware of the healing activity. He concluded that any study of religious healing needed a comprehensive point of view which would include material environments, mental situations, and the belief systems of those involved.

Questionnaire surveys of mysterious experiences have been carried out in Japan by Becker (1990, 1991), Hagio (1990), and Kohri (1994). Kohri (1994), a psychiatrist, conducted a questionnaire survey from May to July in 1991 among medical workers in which the respondents were asked to report anomalous incidents that occurred in their hospitals. The survey items were adapted from a questionnaire developed by James McClenon, then a sociologist at Elizabeth City State University. Kohri obtained 5,183 responses from medical workers in 197 hospitals. The analysis of the data revealed among other things that ESP-like experiences had little correlation with the age of the experiencing person, and that psychiatrists reported visual, auditory, or tactile hallucinations less frequently than other types of respondents. The questionnaire contained only one item concerning NDEs, an experience with which 32% of the sample to have come into contact.

Some authors have grappled with the survival problem in general, including the specific phenomena of NDEs and reincarnation. Books have been published from the point of view of religion (Becker, 1992a),

transpersonal psychology (Nakamura, 1997), and philosophy (Watanabe, 1996). Since the end of the 1970s, Kasahara has published several of his own books and anthologies. He has also translated works on parapsychology in general, including books on reincarnation by Satwant Pasricha and Ian Stevenson.

Since the 1980s, it has been noted that the younger generation of workers tend to be interested in the supernatural and the occult more often than workers of the older generation. Many social-psychological studies have been conducted. These efforts have included the development of the Paranormal Folklore Knowledge Scale (Imaizumi, 1997), research into how spontaneous and precognitive folklore are interpreted and understood (Imaizumi, 1998), and surveys of attitudes toward the acceptability of paranormal experiences (Imaizumi, 1995; Nakamura, 1995), to name a few. Researchers who work in orthodox branches of science have also investigated these topics, although the majority of these studies have been conducted from a stance either neutral or skeptical to the paranormal (Nakajima, Sato, & Watanabe, 1992; Kikuchi, Taniguchi, & Miyamoto, 1995; Kikuchi, & Kinoshita, 1997). These social-psychological studies of the 1990s have assumed that the contemporary occult boom is an inevitable outgrowth of the establishment of modern society. Ichiyanagi (1994) of Nagoya Keizai University, who studied the history of the relationship between spiritual movements and the modernization of society from the beginning of the Meiji era, pointed out that the more science has prided itself on its superiority and denied the paranormal, the more people have become interested in the paranormal. Watanabe, a psychologist at Toho University, and Nakamura, a social psychologist at Ehime University, co-authored a book on this subject (Watanabe & Nakamura, 1998). In it, they offered empirical data as well as an historical analysis. They consider the occult to be the shadow of rationalism/scientism, and have dared to construct a new world view in which they claimed that both narrow-minded scientism and occult beliefs might concurrently be overcome.

### *Theoretical Considerations*

Kasahara (1983, 1993), a psychotherapist at the Laboratory of Mind Studies, has explored the elusiveness problem of psi mainly through the practice of his original system of psychotherapy with psychosomatic, neurotic, and psychotic patients, in which he assumed that the great majority of psychogenic symptoms might be caused by PK, not by stress, serving to discourage patients' conscious happiness when they were unconsciously happy (Kasahara, 1997). He hypothesized that the elusiveness of psi was inevitably caused by a denial of one's own abilities

including psi, a denial which derived from an inherent and persistent, but unknown, mental disposition in humans, in general, to deny happiness (Kasahara, 1995).

Following Beloff (1964, p. 236) and Stevenson (1997, vol. 1, pp. 33-175), Kasahara (1995, pp. 111-52) also believed that in orthodox branches of science a number of disguised forms of phenomena existed which could be treated as paranormal (for example, anomalous phenomena observed in hypnosis, abreaction, and in placebo effects). He is planning to compile, from this viewpoint, a series of anthologies composed chiefly of already-published articles in major English language psychology and medical journals. The first volume, dealing with psychophysiological differences between alter personalities of patients with multiple personality disorder, *Multiple Personality Disorder: Psychophysiological Studies*, was published in Japanese in the summer of 1999.

Theoretical models were also tested, including a consideration of “average mutual information received by all-or-none model” (Kokubo, 1990), a connectionist model of ESP (Hirafuji, 1990), and a discussion of precognitive phenomena by quantum effects (Hirafuji, 1992). Observational theories have often been taken up as a subject of symposia held during the annual conventions of the Japanese Society for Parapsychology (JSPP), including discussions which centered on possible mechanisms and verifications of them.

### *Cognitive Studies*

Among experiments conducted in Japan in the 1990s which are also known abroad are those by the ESPER Laboratory of Sony Corporation, which was directed by Sako (1997). This laboratory, now closed, conducted a number of parapsychological studies, including a series of experiments in the “eyeless perception” of colors (Sako & Ono, 1996, 1997; Sako & Sakakibara, 1997), and in clairvoyance (Sako & Homma, 1996, 1997).

The ESPER staff collaborated with producers of a TV program in presenting possible methods of training for children to induce their clairvoyant abilities. These methods, modeled after Chinese techniques, employed Kanji (Chinese characters), symbols, and simple figures as targets. They claimed that these abilities had been induced relatively easily. As a result, a star subject was successfully discovered, who was later tested by Sako and Homma (1996) under apparently strict conditions, during which her clairvoyant ability was apparently confirmed. They also reported astonishing results with a Chinese star subject, whose abilities had been developed through psi-conducive training in China, in an experiment using as targets a hundred Chinese characters randomly

selected and printed on pieces of paper which were rolled up individually and enclosed in a ping-pong ball (Sako & Homma, 1996). Machi (1996) of Tokyo Denki University measured and found changes in EEG, electrodermal activity (EDA), heart rate, and respiration during clairvoyant trials with another subject, a younger sister of the Chinese star subject who had also developed her abilities through a similar training regime in China.

Experiments on clairvoyance using Chinese characters as the target have seldom been conducted in Japan after their introduction to this field by Tomokichi Fukurai. After Rhine's paradigm was introduced to Japan in the first half of the 1950s, experiments were done exclusively with this paradigm. However, the remarkable results obtained recently in Japan and China suggest that Chinese characters are more appropriate as targets for training psi than forced-choice studies including ESP cards, if such training is, in fact, truly effective. The reason may be that because there is such a large number of Chinese characters, a few thousand of which are daily read and written by Chinese and Japanese, the chance hit rate is extremely low. Thus, trainees can obtain feedback much more accurately and appropriately. In light of the importance of the bandwidth of the target pool (Targ, 1994), and of the response time in experiments with Chinese characters (a few to about 20 minutes), it seems that experiments with Chinese characters fall properly somewhere between forced-choice methods and such free-response methods as Ganzfeld or remote viewing.

ESP experiments with unselected subjects have also been published, some of which have obtained a significant result. Among these are experiments with "paired quadruplet associates" (Hagio, 1997, 1998), Ganzfeld (Hirata, Ito, Kokubo, et al., 1995), remote clairvoyance with network communication (Kokubo, 1995) and with EEG and auditory evoked potential (AEP) measurements (Hirasawa, Yamamoto, Kawano et al., 1995; Hirasawa & Yamamoto, 1996). Hirasawa and Yamamoto (1996) at the Bio-Emission Laboratory of the National Institute of Radiological Sciences, measured the AEP of a subject using auditory targets under similar conditions to those of an experiment conducted by Warren, McDonough, and Don (1992) who used visual targets. Results included the finding of a difference in P2 peak latency between target and non-target tones.

### *Effects on Human Targets at a Distance*

The so-called *tob-ate* of traditional Japanese martial arts is claimed to be an applied skill of *qi* (or *ki*). In a demonstration of *tob-ate*, a master of martial arts would often be observed knocking down target persons or

small animals without physical contact, possibly by *qi*. Yamamoto, Hirasawa, Kawano et al. (1996b) conducted an experiment with a pair of Japanese masters of *tob-ate* under a double-blind condition by isolating them in different rooms of the first and fourth floors of a building, the distance between the rooms being about 11 m. The sender was asked to try to influence the receiver, once at random in an 80-second trial, during which movements of both participants were simultaneously video-recorded. In 16 of 49 trials, a coincidence in the time of their movements was observed, a result which was statistically significant ( $p < 0.01$ ). A similar result had been obtained in a previous experiment carried out under similar conditions (Yamamoto, Hirasawa, Kawano et al., 1996a). These observations have precedent in experiments conducted elsewhere (Eisenbud, 1982, pp. 142-69; Vasiliev, 1963).

AEP was measured during a preliminary remote-viewing experiment by Kokubo, Hirata, Hirasawa et al. (1997), in which 62 volunteer college students who were attending a lecture on parapsychology participated as viewers with three target persons. Each viewer was handed a randomly-selected sealed envelope; each envelope contained a picture of one of the three target persons and viewers were asked to guess who it was. At the same time, EEG and AEP from one of the three target persons was measured. Target persons were in an electromagnetically-shielded room which was at a great distance away from the viewers, about 260 km away. According to the authors' report, a difference was found in the auditory middle latency responses during the experimental period.

### *Effects on Human Targets in Proximity*

In her EEG experiment with a *qigong* master and unselected participants acting as the receivers, Kawano (1998), of the Nippon Medical School, found that a difference in the phase between occipital (O1) and frontal (Fp1) regions of the *qigong* master during a *qigong*-sending (22.5 ms) became appreciably smaller than it was during a resting state (40.4 ms). These effects were also observed in the EEG of the receivers whom the master was trying to influence under a double-blind condition. Kawano noticed that betawave topographies between the master and the participants synchronized during the sending periods. She attributed this apparent synchronization to a possible information transfer from the master to the participants.

Kuramoto, Uchida, and Tsuda (1997), of the Life Science Institute, MOA Health Science Foundation, measured electrodermal activity (EDA) from two groups of participants. The first group were treated by palm healing without physical contact, and the second group was left untreated. The measurement was done by the square wave voltage pulse

method (3V, 256 microseconds) under two conditions, “suggestion given,” and “suggestions not given.” A difference in the EDA indicator pertaining to peripheral blood flow was found between the two groups.

Machi (1993) used thermal imaging to measure a change in body surface temperature during *qigong* trials in which the *qigong* master placed his hand above the back of an unselected participant (receiver), but without physical contact. The distance between the master and receiver was several dozen centimeters, but they were not isolated from each other. The surface temperature of the master’s hands began to rise as soon as he began to try to emit *qi* outwardly. The same phenomenon was observed in the receiver as well after about a 120-second delay.

Machi (1992) analyzed the radiation spectrum of far-red (2.5-40 micro m) light emitted from the palms of the master during a *qigong* trial, and found no specific peak in this range of the wave length. He speculated that for the receiver a physiological mechanism might be influenced by a complex signal composed of infrared and sonic waves from the master, because the far-red signal was at about 1 Hz and the frequency of the micro-vibration (sonic waves) of the master’s palm surfaces was also about 1 Hz. He supposed that this modulation of 1 Hz was ascribable to the respiration of the master.

Bio-photons are a phenomenon claimed to be detectable from cells as an extremely-faint light emission. They are generally assumed among researchers to have an origin in oxygen radicals generated by chemical reactions in the cells. Usa and Inaba (1995), of the Biophotonics Information Laboratories, conducted an experiment on *qigong* as part of their bio-photon research. They attached photomultipliers on the forehead and a finger of a receiver, and asked a *qigong* master to try to influence him from behind. As a result, the bio-photon phenomenon remarkably increased in his finger and decreased in his forehead during these trials. However, they recognized the possibility that these changes might have been caused by psychological variables because the receiver was able to obtain clues to the master’s activities during the trials.

Shibata and Furiya (1993), of Tokyo Women’s Medical College, analyzed venous blood samples of a *qigong* master, and of a receiver collected before, during and after *qigong* trials. A screen was placed between the two who were 1 to 1.5 m away from each other. Tape-recorded instructions were played through headphones to the master and receiver, and the trials were conducted double-blind. No remarkable change was found in the receiver’s blood samples, although leukocytes from the *qigong* master’s blood sometimes increased remarkably in number.

Higuchi, Kotani, Higuchi, et al. (1999), of the Tokyo Institute of Technology, analyzed cortisol, adrenaline, noradrenalin, beta-endor-

phin, and dopamine from the venous blood of three highly-skilled *qigong* masters and four of their patients. Blood samples were collected both before and after external *qi* trials. The index value of the masters and their patients, taken before and after the trials, changed, and the type of change differed among the *qigong* masters. These results could not be obtained exclusively by external *qi*, the authors thought, because patients were aware of the proceedings of the experiment. Higuchi, Kotani, Higuchi et al. (1999), however, assumed that external *qi* should have influenced the human endocrine systems because they already had succeeded in obtaining a similar result in another study in which treatment by external *qi* had suppressed the proliferation of cancerous tissues (Sarcoma 180) implanted into the inguinal region of mice (Higuchi, Uh, Cho et al., 1998).<sup>3</sup>

#### *Anomalous Effects on Lower Animals and Cells*

Takeshige (1993), and Takeshige and Aoki (1994), of Showa University School of Medicine, using lower order animals as subjects, examined the possibility that EEG readings could be changed by an increase in serotonin levels as a result of external *qi* directed towards the pineal gland. They used a micro-electrode to measure electrical pulses from the cells in the pineal gland of a rat under urethane anesthesia. These pulses were used as indices of the activities of the pineal gland. Some interesting results were obtained: (a) The cells of the pineal gland, which react to geomagnetism, showed a decrease in the number of pulses observed when the body of the rat was turned around, and the number of pulses similarly decreased when a medal, which a *qigong* master claimed to have “charged” by external *qi*, was put above the head of the rat. (b) When the medal was held above a rabbit, or a static magnetic field (150 Gauss) was administered to a rabbit from above, EEG readings in the 3.5-6 Hz range showed either an increment or no variance, while those at other frequencies were suppressed. After a pinealectomy of the rabbit, such changes in the EEG were not observed. (c) When a 5-8 mg/kg dose of 5-HTP, a precursor of serotonin, was injected into the rabbit, EEG changes were observed which were similar to those obtained when external *qi* was given. (d) EEG readings in all frequency bands were suppressed when methysergide (3-6 mg/kg), a serotonin antagonist, was administered to the rabbit. When the medal or the 5-8 mg/kg of 5-HTP were given under the same conditions, an increase of in EEG readings in the 3.5-6 Hz range was observed again. These observations are reminiscent of the

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3. The inguinal region in mice and humans can be understood to be either the groin area, or the lowest lateral regions of the abdomen.

“linger effects” reported by some researchers, including Wells and Watkins (1975). Takeshige and Aoki (1994) concluded that *qi* might hamper N-acetyltransferase, increase the secretion of serotonin from the pineal body, and accordingly, the EEG reading might be changed because the serotonin receptor is not antagonistic to methysergide.

Yamauchi, Saitou, Yamamoto et al. (1996), of the National Institute of Radiological Sciences, conducted two exploratory, but more or less controlled experiments, using cultured human cells to identify target systems that might be appropriate for detecting putative effects of palm healing with no physical contact. They asked several healers to try to treat, without contact, two groups of HeLa cells (cultured cancer cells) at their logarithmically proliferating period: one group had been given an aminoglycoside antibiotic (G 418) as a lethal compound; and the other had been exposed to X-ray radiation (5 Gy or 10 Gy) as ionizing radiation.<sup>4</sup> Quantitative analyses revealed no difference between the experimental and the control groups under the G 418 condition, but there was a slightly higher rate of colony formation in the experimental group than in the control under the 10 Gy X-ray radiation condition. The researchers concluded that cultured cells artificially injured by X-ray irradiation would be more appropriate target systems for detecting the quantitative effects of palm healing than those systems continuously affected by a lethal drug.

Yamamoto, Seto, Nakazato et al. (1996), of Showa University School of Medicine, asked a *qigong* master to use external *qi* to treat peripheral blood in test tubes collected from healthy volunteers. Once treated, the researchers measured the activities of the human natural killer (NK) cells in the blood sample by detecting the isotope <sup>51</sup>Cr released from target cells K-562 which had been injured by the NK cells. The cytotoxic activity of treated NK cells in the experimental samples was found to be 113.8% while that of the control samples was 100%.

Kataoka, Sugiyama, and Matsumoto (1997a), of the System Division of Hamamatsu Photonics, investigated the possible mechanism of external *qi* effects by examining human neutrophils, a kind of leukocyte, taken out of peripheral blood collected from healthy volunteers. They prepared phosphate-buffered saline (PBS; pH 7.4) samples in sealed containers and divided them into two groups: the experimental group was treated by external *qi* administered from the outside of the containers without physical contact (*Qi*-PBS), and the control group was left untreated (N-PBS). It is known that neutrophils produce oxygen radicals in the course of phagocytosis (the destruction of particulate matter), or while chemically stimulated. Quantification of oxygen radicals in the

4. One “Gy” is equal to 100 rads which is a unit of measurement of radiation.

samples was done by using the process of chemiluminescence by which method the researchers were able to examine the functions and conditions of the neutrophils. The results indicated that *Qi*-PBS seemed to open the calcium ion channels of the neutrophils, allowing extracellular calcium ions to flow into the cells, and that this activated migration and phagocytization of the neutrophils.

Kataoka, Sugiyama, and Matsumoto (1997b) also conducted an experiment with established human leukemia-T cells (MOLT-4) as the targets. Effector cells, that is, lymphocytes containing NK cells from normal peripheral blood, were treated classified N-PBS (the control condition, without the application of external *qi*) or Qi-PBS (the experimental condition, with application of external *qi*). Both N-PBS and Qi-PBS were mix-cultured with fluorescent-dyed target cells. The cytotoxic activity of the effectors was measured by the volume of broken fluorescent cells leaked out of the target cells. Measured activity of the experimental cells (when using Qi-PBS) was about 1.5 times greater than that of the control cells (when using N-PBS).

Both of these studies (1997a, 1997b) suggested that peripheral blood samples (PBS), if treated, behaved as if the immediate effects of anomalous *qi* effects somehow lingered. It is interesting to note that these results were essentially similar to those reported more than twenty years ago by Grad (1976), although it is unlikely that Kataoka, Sugiyama, and Matsumoto were aware of this earlier study.

The studies cited above seem to indicate that external *qi* (or bio-PK) has two possible effects: one which influences the brain or the central nervous system, thus indirectly causing various physiological responses to occur; and the other which changes the functioning of target systems (in these cases, cellular activities) directly.

### *Chemical and Physical Effects*

In Japan, laboratory experiments on metal-bending and thoughtography were actively carried out from the mid-1970s to the mid-1980s. Several scientists, including the physicist Tsutomu Miyauchi, the metallurgist Shigemi Sasaki, and Tosio Kasahara, conducted experiments with a famous PK subject, Masuaki Kiyota (Kasahara, Kohri, Ro et al., 1981; Miyauchi, Tsunoda & Kiyota, 1977; Sasaki, Koyama, Ochi et al., 1984). In the 1990s, however, metal-bending and thoughtography were no longer considered to be a subject of serious investigation, probably due to social changes as well as to a decline in the activity of the group led by Sasaki, which had been the most prolific.

Among experiments applying an RNG (random number generator) are those by Watanuki, Yoshida, Sannomiya et al. (1993) of the Japan

Psychic Science Association, and by Watanuki and Otani (1995). The former report a significant difference obtained in experiments with an RNG which used the output from a Geiger-Müller tube as the trigger. In this study, the researchers compared results obtained in the normal mind-body state of participants with those obtained during autogenic training, concentration, or during a drowsy state (Watanuki, Yoshida, Sannomiya et al., 1993). Thereafter, they conducted a confirmatory experiment using frontal EEG readings (10 Hz) and EMG readings (detected by a low pass filter set at 2.5 Hz) as indicators of the mind-body state of the participants during autogenic training in which these indicators were fed back to them immediately by a buzzer sound or a fragment of music (Watanuki & Otani, 1995). The RNG output accumulated in experiments over a period of about six months did not show any significant bias in the normal state of the subjects. During the autogenic training, however, the accumulated RNG output reached a *CR* of 2.44 during the first half of the experiment, but gradually descended to a *CR* of 0.64 in the second half.

Exploratory experiments to detect psi or *qi* using a photomultiplier, or by water were also carried out. Two physicians from Showa University School of Medicine tried to detect the operation of psi through changes in the dark current from a photomultiplier (Seto & Hisamitsu, 1993). Sasaki and his colleagues from the University of Electro-Communications made attempts to detect psi through changes in the electrical conductivity of water (Sasaki, Sako, & Kobayashi, 1993; Sasaki, Liu, Liu et al., 1996). In their struggle to invent an apparatus to generate artificial *qi*, engineers at Chubu University conducted a series of pilot experiments to detect changes of the half-width in nuclear magnetic resonance (NMR) spectra of solutions treated by the apparatus (Adachi, Aoki, Yoshifuku et al., 1998a, 1998b, 1999), the results of which are still under examination.

According to Chinese reports made since the 1980s, anomalous magnetic fields, far larger than the usual bio-magnetic fields generated by nerve currents, have often been detected from *qigong* masters and from psychics as well. The measurement of anomalous bio-magnetic fields has been attempted by a few groups of scientists in Japan as well. Kokubo, Yamamoto, Hirasawa et al. (1999) reviewed Japanese and Chinese studies published from 1988 to 1998, and noted three points. They were as follows: (1) Anomalous bio-magnetic fields more than 100 nT were reported in experiments with a few particular subjects much more often than others. (2) Results obtained in these studies might reflect differences of the sensor in sensitivity to factors other than magnetic fields. (3) Reported positions from which anomalous magnetic fields are claimed to have been generated could not be authenticated, because many of the

previous researchers had failed to employ local magnetic shielding. In Japan, few attempts have been made so far to detect such phenomena; therefore, further investigations is needed.

Fukuroda (1995) of the Fujitsu Laboratory measured ozone concentrations in the air near the body surface of participants during a *qigong* trial. He hypothesized that ozone or oxygen radicals might cause unusual phenomena to occur, including the proliferation or extinction of colibacillus, and the observation of anomalous electromagnetic waves around participants during a *qigong* session. Ozone concentrations at the center of participants' palms were measured by ultraviolet absorption. Surface potential was also measured in their palms. The maximum detected ozone concentration was 25 ppb, found for three out of ten participants. No change was observed in the potential corresponding to electrical discharge, but a change was seen in the potential which corresponded to hand movements. Further measurements with the same participants failed to replicate the original results. Fukuroda concluded that the generation of ozone by external *qi* emissions was a rare phenomenon, although it might also be presumed that the ozone had been generated by psi, or that the measuring apparatus had been capriciously influenced by psi.

### Concluding Remarks

In summarizing research into the paranormal conducted in Japan in the 1990s, a few general characteristics can be noted. (1) *Qigong* researchers who have recently begun to study those phenomena are more likely to be active researchers than Japanese parapsychologists in general are. (2) Some experiments have been carried out with living systems. (3) Among the most interesting studies are those using measuring apparatuses, however, the majority of these, unfortunately, cannot be replicated.

Japanese studies of anomalous phenomena are in an active state at present. However, parapsychology is an interdisciplinary field consisting of various branches of science including cognitive sciences, medicine, physics, chemistry, engineering, sociology, religious study, folklore, and anthropology, and the establishment of those fundamentals essential for productive research is very much needed. We suggest that scientists working with these phenomena are unlikely to benefit from trends in scientific research in the 21st century, if the basic fundamentals of research are not established.

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## Appendix

### *Research Fundamentals*

Parapsychology is an interdisciplinary field of science, cutting across many branches of science, and establishment of its research fundamentals is urgently necessary. However, in Japan its establishment is far behind other branches of science, although Japanese parapsychology has a history of more than 110 years, including the work of such eminent pioneers as the philosopher Enryo Inoue (1858-1919) who first dealt with anomalous phenomena from a critical point of view, and the psychologist Tomokichi Fukurai (1869-1952) of the former Imperial University of Tokyo. Among Japanese journals specializing in parapsychology, only the abstracts of the Journal of International Society of Life Information Science appear in general databases.

### *Facilities*

There is no institute in Japan where scientists are able to study paranormal phenomena exclusively. In general, researchers at several institutions or universities are permitted to study anomalous phenomena as a part of their ordinary research program, for example, *qigong* research may be pursued as a part of health science. The International Society of Life Information Science (ISLIS) is planning to establish a new institute for the study of human potential in general, an initiative which will include psi research. The Japanese Association for Alternative, Complementary, and Traditional Medicine (JACT) is also planning to found a new college specializing in complementary, alternative, and traditional medicines.

### *Informational Fundamentals*

There is at present no accessible library in Japan with a sizable collection of books or journals on parapsychology, although the Laboratory of Mind Studies and the Japan Psychic Science Association (JPSA) have an abundance of materials on parapsychology. Neither a library nor a database specializing in this field exists in Japan. The Fukurai Institute of Psychology in Sendai has a collection of materials on Fukurai himself and on his works.

Several academic journals have been published by societies, but no articles have as yet been uploaded to general databases such as JICST (Japan Information Center for Science and Technology) or UnCover, except for articles printed in the *Journal of International Society of Life Information Science*. Few documents can be accessed by MEDLINE. As for the Internet, the JSP and ISLIS offer English abstracts of articles printed in their journals and the Laboratory of Mind Studies provides informative materials in Japanese on their respective homepages.

### *Education*

There is no graduate school in Japan as yet at which students can obtain a doctorate in parapsychology. Masahiko Nakamura lectured on parapsychology from the viewpoint of transpersonal psychology at Ehime University in the mid-1990s. One of us (HK) has lectured at Tokai Women's Junior College. At present, however, the International University of Kagoshima is the only institution which offers a regular course in parapsychology. Professor Shigeki Hagio teaches this course.

### *Funding*

No governmental agencies or university councils have been given a budget for parapsychological pursuits with a single exception. Soji Otani, a professor of psychology at the National Defense Academy, was granted a budget of about three million yen, so that he could establish an electromagnetically-shielded room for EEG measurements. Generally, research activities are supported by private funds or under budgets which are granted for non-parapsychological studies. The Japan Skeptics has been offering a scholarship of several hundred thousand yen per study, and in 1995, the Science and Technology Agency (STA) granted a budget for a five-year project.

### **Abstract**

In Japan, scientific studies dealing with anomalous phenomena are being actively pursued following a rise, nation-wide, in interest in supernatural phenomena including *qigong*, the phenomena attributable to the Indian swami Sathya Sai Baba, and near-death experiences. Research into these

topics has been done primarily by orthodox scientists who were expanding their professional territories to include even the parapsychological domain. Research bearing on parapsychology conducted in the 1990s is summarized under the headings of case studies, cognitive, social-scientific, and theoretical research, experiments with human, subhuman and cellular targets, and physical/chemical studies. Remarkable contributions have been made by *qigong* researchers who have only been working in this area for a decade. Especially interesting results have been obtained in experiments on external *qi*, or what we might call bio-PK. However, the fundamentals necessary for a productive research program are still not sufficiently established in Japan, and unless shortcomings are addressed, future research developments will be hindered.

**French Abstract**

**German Abstract**

**Italian Abstract**

**Japanese Abstract**

**Portuguese Abstract**

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**Spanish Abstract**