



*Special Lecture*

## Scientific Elucidation of Pyramid Power: I

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**Abstract:** We have been carrying out research to elucidate an unexplained function, the so-called “pyramid power”, of a pyramidal structure (PS) for 13 years from October 2007 to the present, September 2020, at the International Research Institute (IRI). Until our work, there were few reports that presented statistically significant results regarding unexplained functions of the PS. For experiments, we made the PS that the test subject could enter. We used edible cucumber sections (*Cucumis sativus* 'white spine type') as a biosensor to detect the unexplained functions of the PS. The biosensors were placed on the PS apex, and two types of detection experiments of a pyramid effect near the PS apex were conducted by analyzing the released gas concentration. (i) The first type was conducted in a state where the test subject might have some influence on the PS. (ii) The second type was conducted in a state where the subject's influence on the PS was excluded. In addition, we considered that the experiment of type (i) had three different influences exerted by the test subject on the PS as follows: (i-1) when the unconsciousness ("force type I") of the test subject who was more than 6 km away from the PS affected the PS; (i-2) when the test subject's condition ("force type II") during meditation inside the PS affected the PS; and (i-3) when the reaction of the PS to "force type II" continued after the test subject left the PS. The experiment of type (ii) was conducted in a situation where the test subject did not enter the PS for at least 20 days or longer. From the results of (i-1), (i-3) and (ii), the existence of unexplained functions of the PS, “pyramid power” was demonstrated with high statistical accuracy. From the results of (i-1), the pyramid effect that was considered to correspond to the unconscious change from the sleeping state to the awake state of the test subject 6 km or more away was detected (1% significance). From the results of (i-3), the pyramid effect with a delay was found for over 10 days after meditation ( $p=3.5 \times 10^{-6}$ ; Welch's t-test, two-tails, the following p values are also the Welch's t-test values). The pyramid effect with delay could be approximated very well by the theoretical curve calculated from the model of transient response phenomena. On the other hand, the pyramid effect has not been detected so far from the results of (i-2). However, it is quite possible that the pyramid effect during meditation by the test subject inside the PS will be detected by increasing the number of data in the future. From the results of (ii), the pyramid effect due to the potential power of the PS was detected ( $p=6.0 \times 10^{-3}$ ). Furthermore, it was clarified that the potential pyramid effect for the upper and lower layers of the biosensors stacked in two layers at the PS apex was different, and the pyramid effect for the upper layer biosensors was greater than that of the lower layer ( $p=4.0 \times 10^{-7}$ ). The results obtained so far through rigorous scientific experiments and analyses are the world's first research results demonstrating the existence of the pyramid power. We expect that this achievement will open up a new field of science and contribute to the development of a wide range of application fields.

**Keywords:** pyramid, meditation, unconsciousness, potential, delay, biosensor, cucumber, gas, psi index



## 1. Introduction

In the late 1930s, the Frenchman Antoine Bovis found a naturally mummified small animal in the Great Pyramid of Giza. This was the beginning of research on a so-called "pyramid power". Since then, many publications on "pyramid power" have been published [1-18]. Among them, there are some in which a scale model of the Great Pyramid of Giza was made and experiments were conducted [1-4, 8, 12, 18]. There is another that approached explanation of the unexplained functions of the pyramid using a mathematical formula [17], and one that showed patent information [15]. However, scientific research papers published in academic journals are rare [19, 20]. On the other hand, it is true that there are documents that deny the existence of the "pyramid power" as pseudo-science [21-24]. The rationale for denying the "pyramid power" is the lack of sufficient statistical significance for any results and the lack of a scientific theory to understand the phenomenon.

In order to demonstrate the existence of the "pyramid power", which has been said to have no scientific basis, we conducted the "Sakamoto Hypertech Project: SHyP" for 10 years from October 2007 to September 2017. This project was joint research between the International Research Institute (IRI, Chairman of the Board of Directors: Mikio Yamamoto) and Aquavision Academy Co., Ltd. (President: Masamichi Sakamoto). From October 2017 to the present, September 2020, the joint research project "Pyramid Power Project : PPP" by the IRI and Aquavision Academy Co., Ltd. has been continued. The SHyP conducted experiments to detect the pyramid effect, "pyramid power" using a pyramidal structure (PS). The data analyzed in this report are experimental data from July 2010 to September 2017. In the meditation experiment, the test subject entered the PS and meditated 3 times in the morning and 3 times in the afternoon, a total of 6 times.

Two types of detection experiments of the pyramid effect

were conducted for different conditions. The two types were (i) and (ii) and they are described as follows.

Experiment type (i): This experiment was conducted under the condition that the test subject might have some influence on the PS.

Experiment type (ii): This experiment was conducted under the condition that the influence of the test subject on the PS was excluded.

The effects of the test subject on the PS under type (i) could be classified into the following three influences.

(i-1) When the unconsciousness ("force type I") of the test subject who was more than 6 km away from the PS affected the PS.

(i-2) When the test subject's condition ("force type II") during meditation inside the PS affected the PS.

(i-3) When the reaction of the PS to "force type II" continued after the test subject left the PS.

The results of (i-1)-(i-3) and (ii) are as follows.

Experimental results of (i-1): The pyramid effect due to the test subject's influence was detected (1% significance) even when the test subject was more than 6 km away from the PS [25, 26]. This experiment was conducted by the experimenter at the time when the test subject was at home (6.55 km in a straight line from the laboratory) during the period of waking from sleep, 5:30-8:30. From this, we considered that the unconsciousness during sleep before the test subject woke up and the unconscious state after waking up had an influence on the PS present over a long distance. Therefore, we concluded that the PS has the function of capturing unconsciousness (force type I) of the test subject more than 6 km away and converting it into energy that can be detected by the biosensors. However, the following assumptions were made in deriving this conclusion. "There is a positive correlation between the magnitude of the test subject's unconsciousness (force type I) and the magnitude of energy converted by the PS of force type I. There is a positive correlation between the magnitude of the energy converted by the PS and the magnitude of the pyramid effect



affecting the biosensors." The magnitude of the pyramid effect was almost zero at the average time when the test subject awakened, but it became large in the time period before and after that. These results suggested that the magnitude of unconsciousness (force type I) may change with time before and after waking up.

Experimental results of (i-2): The pyramid effect was not detected in the 1% significant range while the test subject was inside the PS and meditated.

Experimental results of (i-3): Pyramid effect was detected over a long period of several hours to 10 or more days after the test subject left the PS [27-31]. From this, we concluded that the PS has the function of accumulating unexplained energy (force type II) in the state of meditating by the test subject inside the PS and converting it into energy that can be detected by the biosensors. The results of (i-1) and (i-3) were the pyramid effect obtained for the condition that the influence of the test subject on the PS was considered. From this, it was possible to obtain circumstantial evidence that two types of unexplained energies, named force types I and II, originated from a human, the test subject.

Experimental results of (ii): The existence of the potential power of the PS was demonstrated with 1% significance by an experiment conducted in a state where the influence of the test subject on the PS was excluded. We considered that the potential power of the PS is the generally known "pyramid power". It was revealed that the potential pyramid effect of the PS varied seasonally and was greater in summer than in winter [32]. In addition, it was found that the biosensors stacked in two layers at the PS apex had different pyramid effects for the upper and lower layers, and the pyramid effect for the biosensors in the upper layer was greater than that in the lower layer. (The p-value, which is a measure of the chance of the difference between the average pyramid effect for the upper biosensors and the average pyramid effect for the lower biosensors, is  $p=4.0 \times 10^{-7}$ ; Welch's two-tailed t-test. Subsequent p-values are similar test results) [33].

The experimental results (i-1)-(ii) obtained by rigorous

scientific experiments and analyzes are the world's first research results demonstrating the existence of so-called "pyramid power". We expect that this achievement will open up a new field of science.

## 2. Experiment

### 2-1. Biosensor that detects the pyramid effect, "pyramid power"

To clarify the unexplained function of the PS, we analyzed the gas concentration released from the biosensors, cucumber fruit sections. It is generally known that living organisms such as plants undergo biological defense and repair reactions when damaged [34-37]. We focused on gas generation at the cut surface in the biological defense and repair reactions of cucumber. And the existence of the pyramid effect was verified by measuring and analyzing the gas concentration released from the cucumber sections. Samples were prepared according to the simultaneous calibration technique (SCAT) for simultaneous preparation of uniform biosensors (Figs. 1, 2) [38]. Focusing on the gas concentration released from cucumber sections, a method of using cucumber sections as the biosensors was researched and developed at IRI. So far, we have succeeded in detecting the non-contact effect by the healer and the biological field distributed around the healer [39-41].  $G_{E1}$  and  $G_{E2}$  of Pair1 and Pair2 in Fig. 2 were placed at the PS apex, and  $G_{C1}$  and  $G_{C2}$  of Pair1 and Pair2 and  $G_{E3}$ ,  $G_{E4}$ ,  $G_{C3}$  and  $G_{C4}$  of Pair3 and Pair4 were placed at the calibration control point 8 m away from the PS (Figs. 3-5). The biosensor installation time was 30 minutes. Here,  $G_{E1}$ - $G_{E4}$  were used as an experimental sample and  $G_{C1}$ - $G_{C4}$  were used as a control sample. The cut surfaces of  $G_E$  and  $G_C$  of the pair were the same, but the cut surfaces were in different directions. If the  $G_E$  cut surface was oriented in the same direction as the cucumber growth axis, the  $G_C$  cut surface would be in the opposite direction. Experiments have revealed that the emission gas concentration varies depending on the direction of the cut

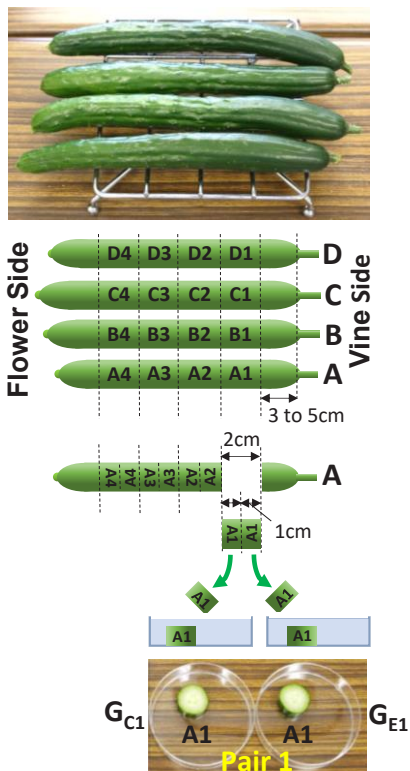


Fig. 1 Preparation of the biosensors.

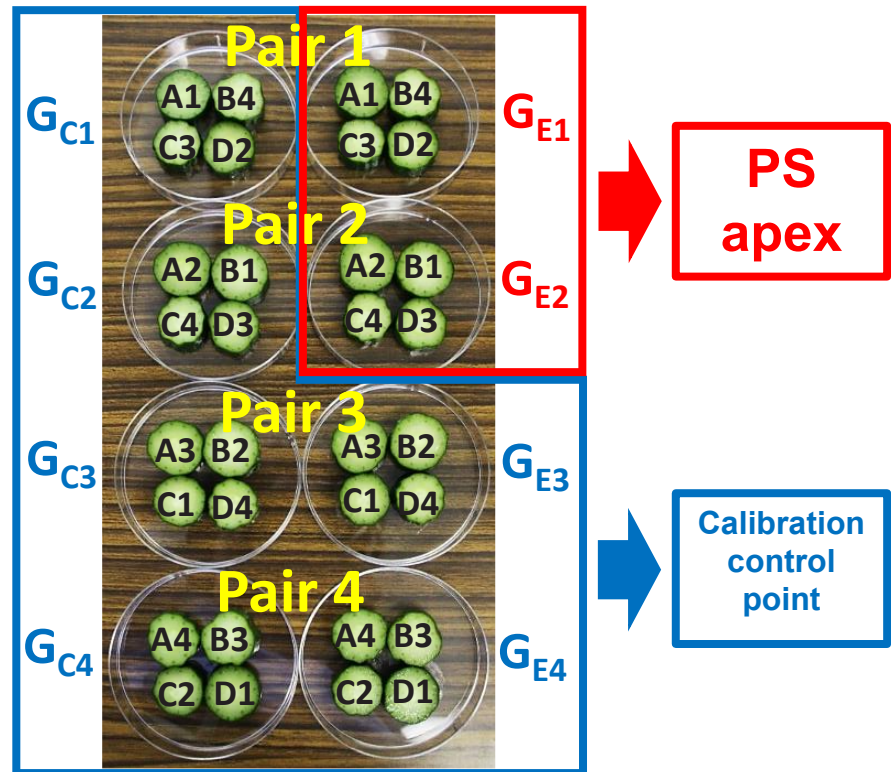


Fig. 2 The biosensors prepared (Pair1 to Pair4).



Fig. 3 The pyramidal structure (PS).

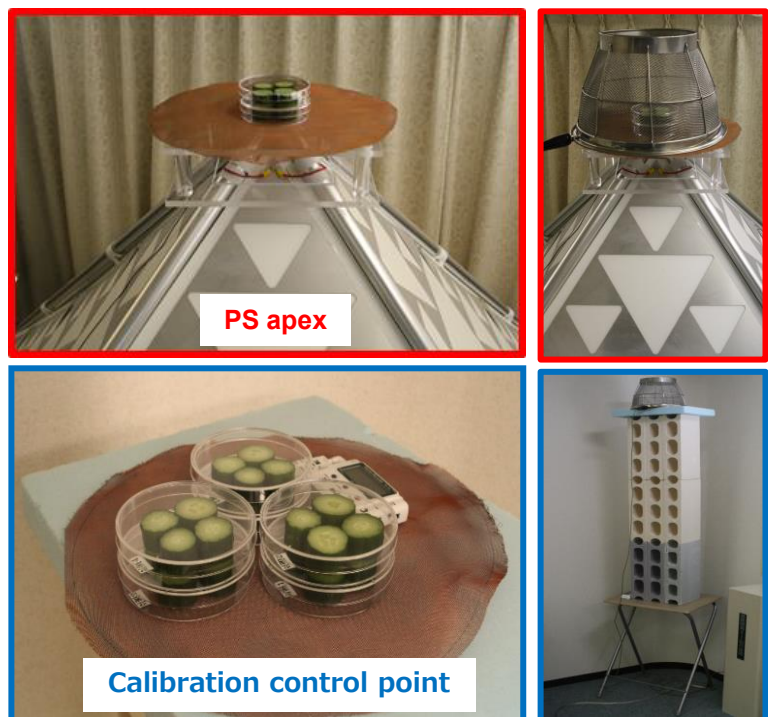


Fig. 4 Upper: The biosensors placed at the PS apex.  
 Bottom: The biosensors placed at the calibration control point.

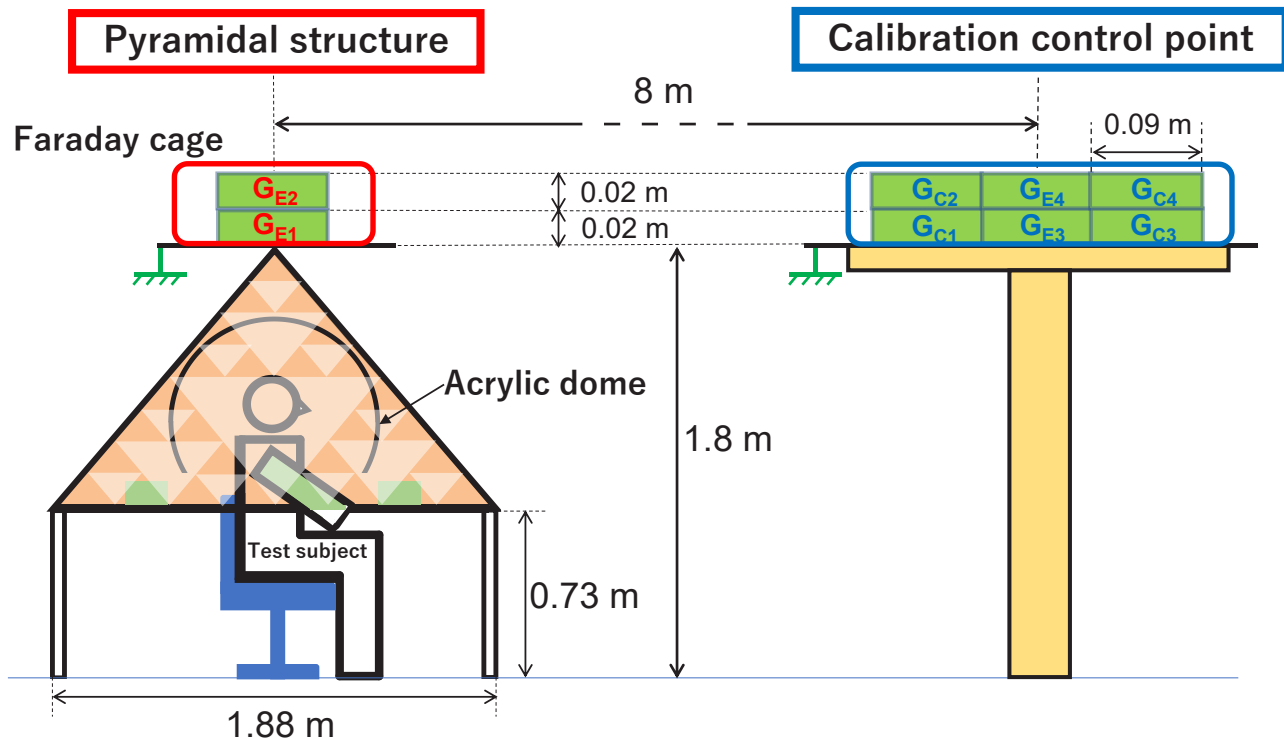


Fig. 5 The pyramidal structure, calibration control point, positional relationship to test subject (schematic diagram).

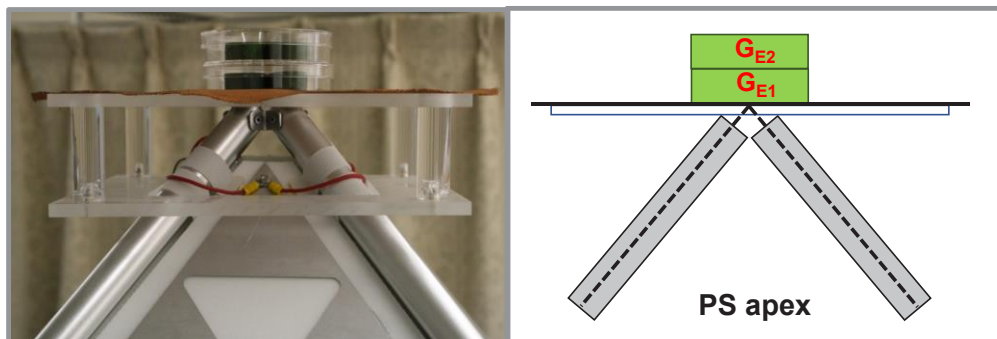


Fig. 6 The biosensors placed in two layers on the PS apex.

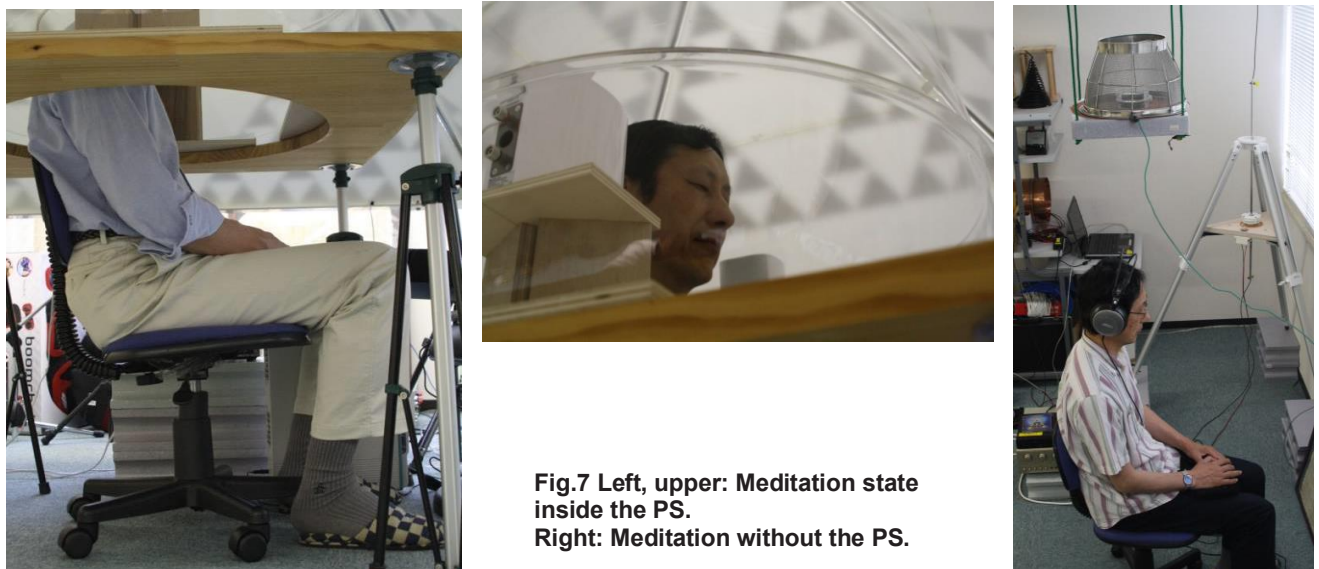


Fig.7 Left, upper: Meditation state inside the PS.  
 Right: Meditation without the PS.



surface, and the gas concentration is  $G_E < G_C$  [42, 43]. To date, more than 12,000 cucumbers have been used to make biosensors, and more than 24,000 gas concentration data have been obtained. The biosensors placed at the PS apex and the calibration control point were electrostatically shielded by an electrically grounded Faraday cage. The Faraday cage was 180 cm above the floor. The  $G_{E1}$  and  $G_{E2}$  near the PS apex and the Faraday cage were placed on the PS using the support legs of the insulator. On the support legs of the insulator, there was a copper net that was shaped into a circle, and  $G_{E1}$  and  $G_{E2}$  were placed on top of it,  $G_{E1}$  in the lower layer,  $G_{E2}$  in the upper layer (Figs. 5 and 6). The center of the bottom of the  $G_{E1}$  Petri dish was aligned with the extension of the center of the four aluminum pipes near the PS apex (Fig. 6). On the other hand, at the calibration control point,  $G_{C1}$  and  $G_{C2}$ ,  $G_{E3}$  and  $G_{E4}$ ,  $G_{C3}$  and  $G_{C4}$  were placed on top of each other, and the Petri dish with the larger subscript number was the upper layer. After being placed at the measuring point for 30 minutes, the lid of the Petri dish was removed, one Petri dish was placed in each closed container having a volume of 2.2 liters, and the closed containers were arranged side by side for each pair and stored. The storage time was 24 h-48 h. After storage, the gas concentration released from the biosensors was measured. Gas detection tubes (Ethyl acetate detector tube 141 L: Gastech, Japan) and a gas sampling pump (GV-100: Gastech, Japan) were used to measure the gas concentrations.

## 2-2. Pyramidal structure (PS)

The PS used in the experiment is shown in Fig. 3. The PS was a square pyramid with a height of 107 cm, a ridgeline length of 170 cm and a base length of 188 cm. The tilt angle, between the bottom and the side of the PS was  $49.1^\circ$ . The base of the PS was raised by four tripods to a height of 73 cm from the floor. The frame of the PS was made of four aluminum pipes (2 cm diameter, 0.36 cm thick pipe wall), the top ends of which were connected. The bottom ends of each pipe were placed at the four corners of a square (188 cm on

each side, the base length) made with four aluminum L angles. The four aluminum pipes were not electrically connected to the L angles, and they were not electrically grounded. The four sides of the PS were made of 1 cm thick polystyrene boards, which were not grounded. Each side had a Sierpinski triangle pattern and it consisted of nine aluminum plates (40.85 cm  $\times$  40.85 cm  $\times$  43 cm, 0.3 mm thick) which were attached to the polystyrene board. Therefore, a total of 36 aluminum plates were used. The four aluminum pipes were electrically connected to the aluminum plates on all the sides, but since the pipes were not grounded, the aluminum plates were not either. Inside the PS, a transparent acrylic (0.5 cm thick) dome (85 cm diameter, 66.5 cm high) with a spherical shape was placed. The lower portion of the sphere had been removed where the diameter of the sphere cross section was 68.1 cm. The dome was sitting on a wooden square board (99 cm  $\times$  99 cm, 3 cm thick) with a 70 cm diameter hole in the center. The bottom surface of the board was held at a height of 85 cm from the floor by four tripods. The center hole in the board allowed the test subject to insert his head and upper body into the dome space. The dome was designed so that the voice of the test subject could resonate when his upper body was in the dome. A schematic diagram of the positional relationship among the PS, the calibration control point, the test subject, the biosensors, etc. is shown in Fig. 5.

## 2-3. Meditation by the test subject

The test subject entered the PS to meditate (Fig. 7, left, center). The meditation method was as follows. The test subject sat in a chair located just below the pyramid apex. During the 30-minute meditation, three times in the morning and three times in the afternoon, the test subject was listening to the Hemi-Sync®, HJS#1; Healing Journeys Support (HJS) track 1 [44]. The Hemi-Sync® is an acoustic technology that helps long-term meditation. Since the test subject was wearing headphones, there was no sound leaking around, but the test subject sometimes uttered a vowel sound. During



meditation, the test subject had the image of taking in energy from the earth when inhaling and taking in energy from heaven when exhaling. In addition, the test subject meditated without being aware of the biosensors of  $G_{E1}$  and  $G_{E2}$  placed on the PS apex above the head. After the meditation was completed, the test subject recorded the meditation status. Fig. 7 right shows meditation without the PS.

#### 2-4. Two kinds of experiments under different conditions

Fig. 8 schematically shows two types of experiments (i) and (ii) under different experimental conditions. The experiment of type (i) was conducted under the condition that the test subject might have some influence on the PS. This experiment is basically an experiment conducted continuously for 3 days (Day1-Day3) and an experiment conducted from several days to 20 days (Day4-Day22) after meditation. However, the number of data of pre1 and pre2 in this report do not match because the experiment was started from pre2 of Day2 without conducting pre1 of Day1. On the other hand, regarding pre2, med and post1 of Day2, the number of data is consistent in this report because only the data that were continuously obtained from pre2 to post1 were used. The experiment of type (i) could be divided as having three influences: (i-1) experiments conducted before the test subject entered the PS (pre1, pre2); (i-2) experiments conducted during the test subject's meditation inside the PS (med); and (i-3) experiments conducted after the test subject left the PS (post1-post6). For pre1, pre2, med, post1, and post2, the time period for each experiment was set between Day1-Day3. However, regarding post3-post6, the experiment was done between Day4-Day22. The pre1 was conducted under the condition that the test subject did not enter the PS for more than 20 days. The reason is that when the test subject entered the PS and meditated, the influence by the test subject was detected for more than 10 days. Therefore, in order to exclude the test subject's influence, we decided that the test subject should not enter the PS for more than 20 days [28, 29]. The experiment of type (ii) was

conducted with the influence of the test subject on the PS excluded. This experiment was a blank experiment and was conducted after Day23. At the bottom of Fig. 8, the contents of the actual experiment conducted on Day2 are described: three runs of pre2 before the test subject entered the PS, six runs of med where the test subject was meditating inside the PS, three runs before lunch (med1) and three runs after lunch (med2), and three runs of post1 after the test subject left the PS. The time for one run was 30 minutes, and the interval between runs was 10 minutes. The pre1, post2-post6, and blank experiments conducted on days other than Day2 were also conducted in units of three runs.

#### 2-5. Psi index ( $\Psi$ ) that represents the magnitude of the pyramid effect

In order to verify the pyramid effect on the biosensors placed at the PS apex, we introduced the psi index  $\Psi$  which is an index to quantify the magnitude of the pyramid effect.  $\Psi$  was obtained by calculating the ratio of the gas concentrations released from each pair of the biosensors and multiplying their natural logarithm by 100. The gas concentration released from the biosensors at the PS apex seems to include the pyramid effect, but it may be buried in the noise of the data. The reason is that the gas concentration released from cucumber is considered to be easily affected by differences in individual cucumbers and various environmental factors. Therefore, in order to minimize the displacement of noise, we adopted the method of comparing  $G_E$  and  $G_C$  as a pair (Fig. 2). The relationships between the  $J$  value [45] we used as the magnitude of the pyramid effect until 2019 and the psi index  $\Psi$  are as follows, where  $\Psi=100J$ .

$$\begin{aligned}\Psi_1 &= 100 \ln(G_{E1}/G_{C1}), \\ \Psi_2 &= 100 \ln(G_{E2}/G_{C2}), \\ \Psi_3 &= 100 \ln(G_{E3}/G_{C3}), \\ \Psi_4 &= 100 \ln(G_{E4}/G_{C4}).\end{aligned}\quad (1)$$

In equation (1),  $G_{E1}$ - $G_{E4}$  and  $G_{C1}$ - $G_{C4}$  are gas concentrations (ppm) from the biosensors shown in Fig. 2.  $\Psi_1$ - $\Psi_4$  are the psi indices before calibration. It is considered

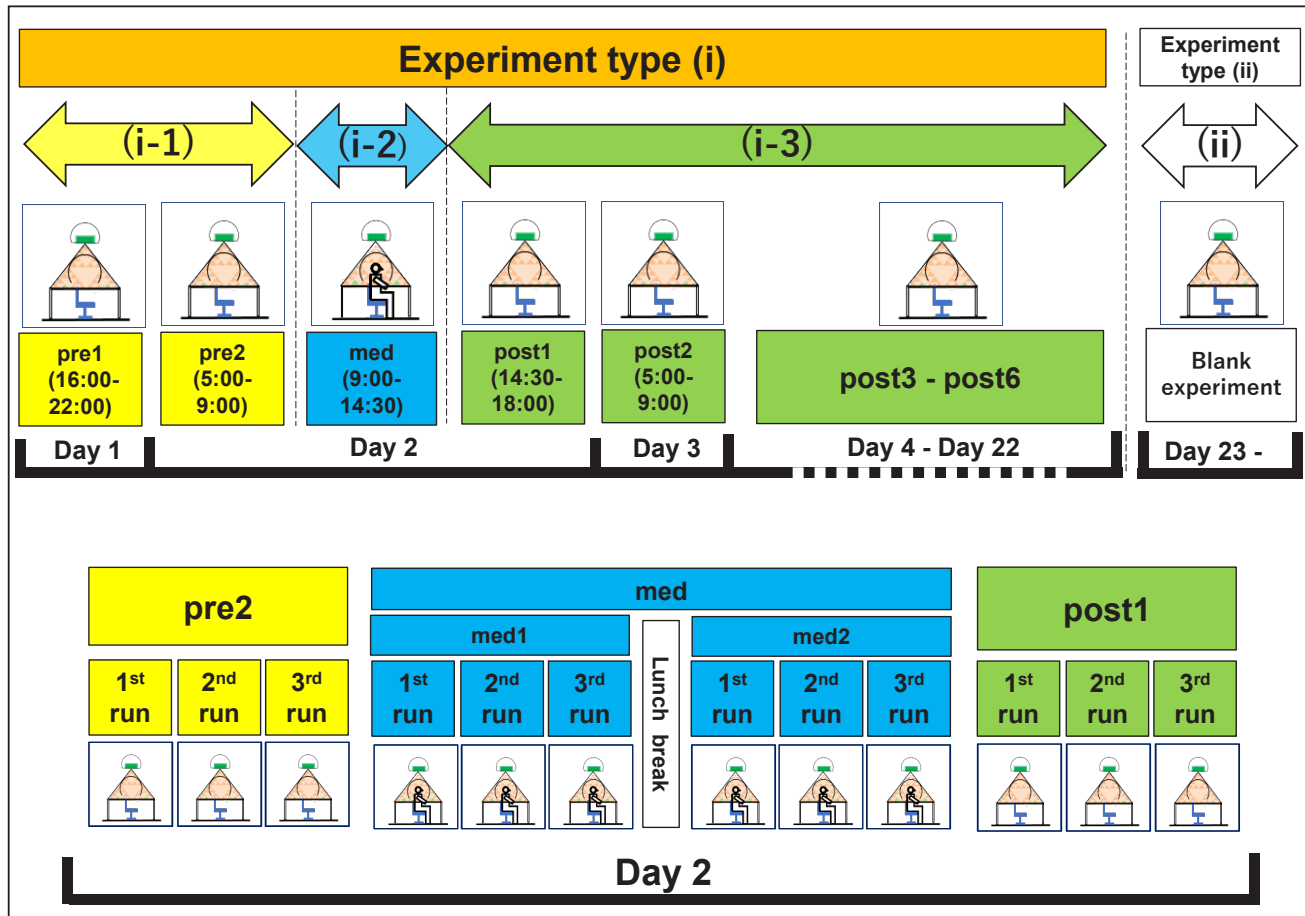


Fig. 8 Experiment of types (i) and (ii) and experimental flow.

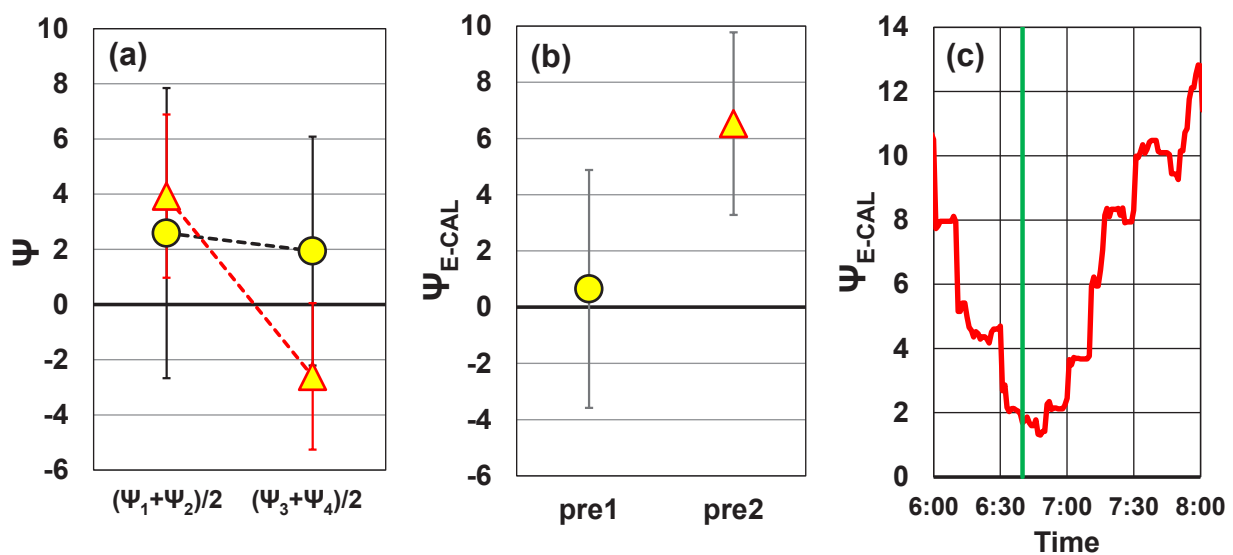


Fig. 9 Results when unconsciousness of the test subject more than 6 km away from the PS affected the PS. Error bars in (a) and (b) are 99% confidence interval. The green line shows 6:40, the normal wake-up time of the subject.



that the influence due to the difference in the direction of the cut surface of the cucumbers is detected from  $\Psi_3$  and  $\Psi_4$ . From  $\Psi_1$  and  $\Psi_2$ , it is considered that the results of two effects due to the difference in the direction of the cut surface and the difference in the installation location, PS apex and calibration control point, are detected.  $\Psi_{1(E-CAL)}$  and  $\Psi_{2(E-CAL)}$  obtained by subtracting the average value of  $\Psi_3$  and  $\Psi_4$  from  $\Psi_1$  and  $\Psi_2$  are the results of calibrating the effects of the direction of the axis of the cucumber cut surface and various external environments such as temperature, humidity, atmospheric pressure and geomagnetism. Therefore,  $\Psi_{1(E-CAL)}$  and  $\Psi_{2(E-CAL)}$  were considered to be the results reflecting the pyramid effect of the PS.

$$\begin{aligned}\Psi_{1(E-CAL)} &= \Psi_1 - (\Psi_3 + \Psi_4)/2, \\ \Psi_{2(E-CAL)} &= \Psi_2 - (\Psi_3 + \Psi_4)/2, \\ \Psi_{3(C-CAL)} &= \Psi_3 - (\Psi_3 + \Psi_4)/2, \\ \Psi_{4(C-CAL)} &= \Psi_4 - (\Psi_3 + \Psi_4)/2.\end{aligned}\quad (2)$$

The calibrated psi index at the PS apex is calculated by the following formula.

$$\Psi_{E-CAL} = (\Psi_{1(E-CAL)} + \Psi_{2(E-CAL)})/2. \quad (3)$$

We also took the viewpoint that there may be different pyramid effects in the upper and lower layers of the biosensors placed in two layers. Therefore, we modified the  $\Psi_{E-CAL}$  that has been used so far so that it can calibrate the difference between the upper and lower layers.

$$\begin{aligned}\Psi_{1(E-CAL)Layer1} &= \Psi_{1(E-CAL)} - \Psi_{3(C-CAL)} = \Psi_1 - \Psi_3, \\ \Psi_{2(E-CAL)Layer2} &= \Psi_{2(E-CAL)} - \Psi_{4(C-CAL)} = \Psi_2 - \Psi_4.\end{aligned}\quad (4)$$

Here, if  $\Psi_{(E-CAL)LayerAve}$  is the average of  $\Psi_{1(E-CAL)Layer1}$  and  $\Psi_{2(E-CAL)Layer2}$ ,

$$\begin{aligned}\Psi_{(E-CAL)LayerAve} &= (\Psi_{1(E-CAL)Layer1} + \Psi_{2(E-CAL)Layer2})/2 \\ &= (\Psi_{1(E-CAL)} + \Psi_{2(E-CAL)})/2 = \Psi_{E-CAL}.\end{aligned}\quad (5)$$

### 3. Experimental and analytical results

#### 3-1. Experiment of type (i) results

##### 3-1-1. (i-1) Results when unconsciousness (force type I) of the test subject 6 km or more away from the PS affected

#### the PS

Fig. 9 (a) compares the psi index before calibration of pre1 and pre2. The circles are the results of pre1 (number of data  $n=44$ ), and the triangles are the results of pre2 ( $n=213$ ). The numbers of data of pre1 and pre2 are different because, as pointed out in section 2-4, pre1 was not always conducted on the day before pre2. From  $(\Psi_3 + \Psi_4)/2$  calculated from the biosensors placed at the calibration control point, it was considered that the difference depending on the direction of the cut surface was detected. On the other hand, the  $(\Psi_1 + \Psi_2)/2$  results calculated from the biosensors placed at the PS apex and the calibration control point were considered to reflect the two different effects. It was the difference in the direction of the cut surface and the difference in the installation location. In the case of pre1, there was no significant difference between  $(\Psi_1 + \Psi_2)/2$  and  $(\Psi_3 + \Psi_4)/2$ , but in the case of pre2, a significant difference was detected ( $p = 2.8 \times 10^{-5}$ ) [25]. Error bars are 99% confidence interval.

Fig. 9 (b) shows the average value of the calibrated psi index ( $\Psi_{E-CAL}$ ) of pre1 and pre2. The pre1 was zero within the margin of error, but pre2 had a significantly positive value for  $\Psi_{E-CAL}$ . Error bars are 99% confidence interval. As a result, in pre1, the pyramid effect due to the influence of the test subject more than 6 km away was not detected, but in pre2, the pyramid effect due to the influence of the test subject was detected (1% significance) [25, 26].

Fig. 9 (c) shows the moving average of pre2, 60-minute window. It was found that  $\Psi_{E-CAL}$  had the minimum value during the time period 6:30-6:59 ( $n=60$ ). The regular time that the test subject, who entered the PS and meditated, woke up each morning was 6:40 (green line). Therefore, it was suggested that the pyramid effect due to unexplained energy (unconsciousness; force type I) from the test subject was detected in the time period before and after the test subject woke up, and that the effect might be zero at the time of waking up. It was also suggested that force type I may change during the period from the test subject's sleep state to awake state [25, 26].



### 3-1-2. (i-2), (i-3) Results when the test subject was meditating inside the PS and when the PS reaction continued after meditating

Fig. 10 (a) shows the average  $\Psi_{E-CAL}$  values for med1, med2, post1, and post2 in Fig. 8, experimental data from spring equinox to autumn equinox, and summer data. Blue circles represent med1 and med2, and green circles represent post1 and post2. The origin 0 on the horizontal axis is the time when the 1st run of med1 was started. Fig. 10 (a) is an enlarged view of the time period of 0 to 20 hours in Fig. 10 (b). Each error bar indicates the standard error. From the results of med1 ( $n=72$ ) and med2 ( $n=72$ ),  $\Psi_{E-CAL}$  during meditation by the test subject was zero within the margin of error, and the pyramid effect could not be detected. However,  $\Psi_{E-CAL}$  increased from post1 ( $n=72$ ) and reached the maximum value at post2 ( $n=30$ ) 20 hours after the start of meditation. The results of post1 were compared with the results of blank experiment ( $n=24$ ) under the experiment of type (ii). However, the data of the blank experiment were the data obtained in the experiment of the same time period as the time period, 14:30-18:00, when post1 was conducted. As a result, the existence of the pyramid effect in post1 was demonstrated with very high statistical accuracy ( $p=3.5 \times 10^{-6}$ ) [26, 28]. The pyramid effect decreased exponentially 2.5 days (post3,  $n=23$ ), 6.5 days (post4,  $n=23$ ), and 11 days (post5,  $n=24$ ) after the start of the 1st run of med1. About 20 days later (post6,  $n=78$ ), it became almost zero (Fig. 10 (b)).

From this result, we found a peculiar pyramid effect with a delay that lasted for more than 10 days from the start of meditation. About 20 days after the start of meditation, the pyramid effect was no longer detected, so it was thought that the effect of the test subject (force type II) was excluded from the PS apex at this point, returning to the initial state. Fig. 11 shows the theoretical curve (red line) of the pyramid effect, which is the result of the theoretical calculation of the output signal  $y(t)$  due to the transient response of the second-order lag element system. Here, the unexplained energy (force type

II) by the test subject was calculated as the input signal  $q(t)$ . The time variation of the output signal approximated the peculiar pyramid effect with delay very well. It was clearly shown that the peculiar pyramid effect with delay corresponded to a transient response of the second order lag element system with a damping coefficient  $\xi=3.074$ , a specific angular frequency  $\omega_n=1.286$  and a gain coefficient  $K=1.22$  [28]. The delayed pyramid effect could be similarly approximated using a two-step reaction model involving one reaction intermediate [41].

### 3-1-3. Causes of the peculiar pyramid effect with delay

During the med time period, 9:00-14:30, in Fig. 8, the pyramid effect was not detected in the experiment in which the test subject meditated inside the PS. After med, the pyramid effect began to be detected in the post1 time period (14:30-18:00) after the test subject left the PS. To understand this result, we assumed the existence of unexplained energy (force type II) by the test subject inside the PS. Then, it was concluded that the force-type II was accumulated and converted in the PS, and the pyramid effect with a delay was detected. But the question remained: is this process the only requirement for the pyramid effect to be detected in the post1 time period and thereafter? Therefore, a verification experiment was conducted. The verification experiment consisted of four patterns of experiments, (a)-(a'), (b)-(b'), (c)-(c'), (d)-(d'), shown in Fig. 12 (a). There were four patterns of whether the PS existed in the time period of med, post1 and post2, and whether there was meditation by the test subject in the time period of med. The left and upper parts of Figs. 7 are the meditation state of (a), and the right part of Fig. 7 is the meditation state of (b). Fig. 12 (b) shows the results. The results for the med time period on the horizontal axis are the average of  $\Psi_{E-CAL}$  conducted in the patterns of (a)-(d), and the results for the post1 and post2 time periods on the horizontal axis are the average of  $\Psi_{E-CAL}$  conducted in the patterns of (a')-(d'). From this, in the med time period, whether the PS existed or not, and whether the test subject

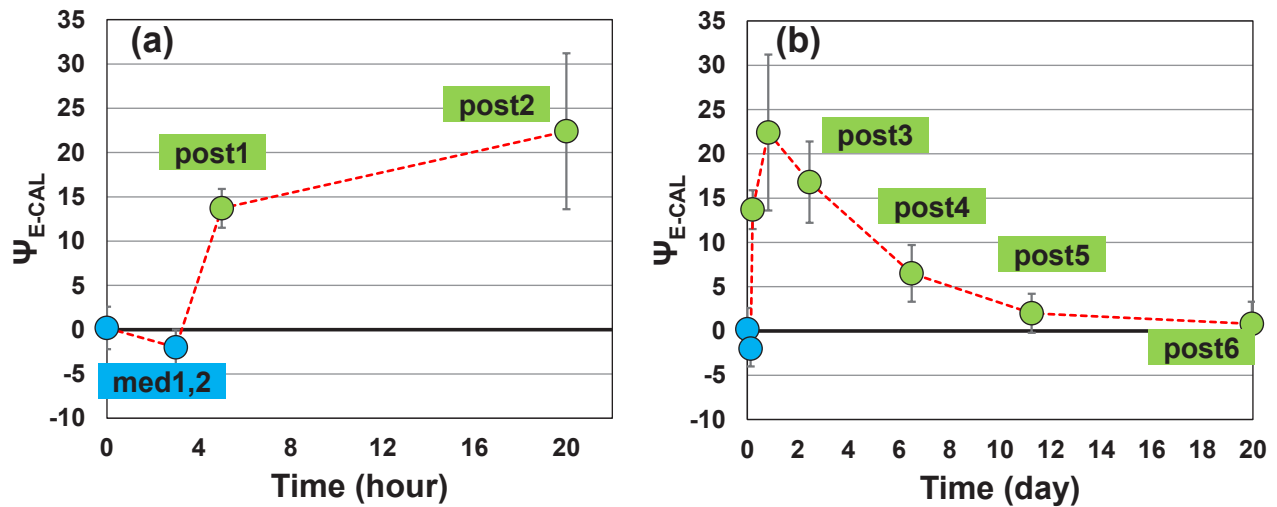


Fig. 10 Results when the test subject is meditating inside the PS and when the PS reaction continues after meditating.

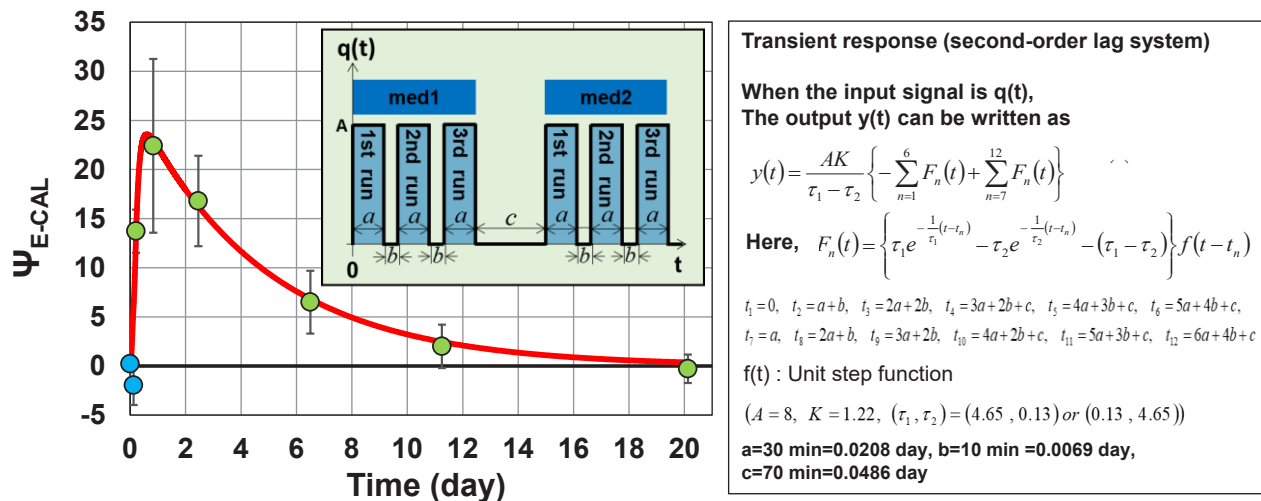


Fig. 11 Pyramid effect simulation result with delay due to transient response. The red line is the result obtained from the theoretical equation shown on the right.

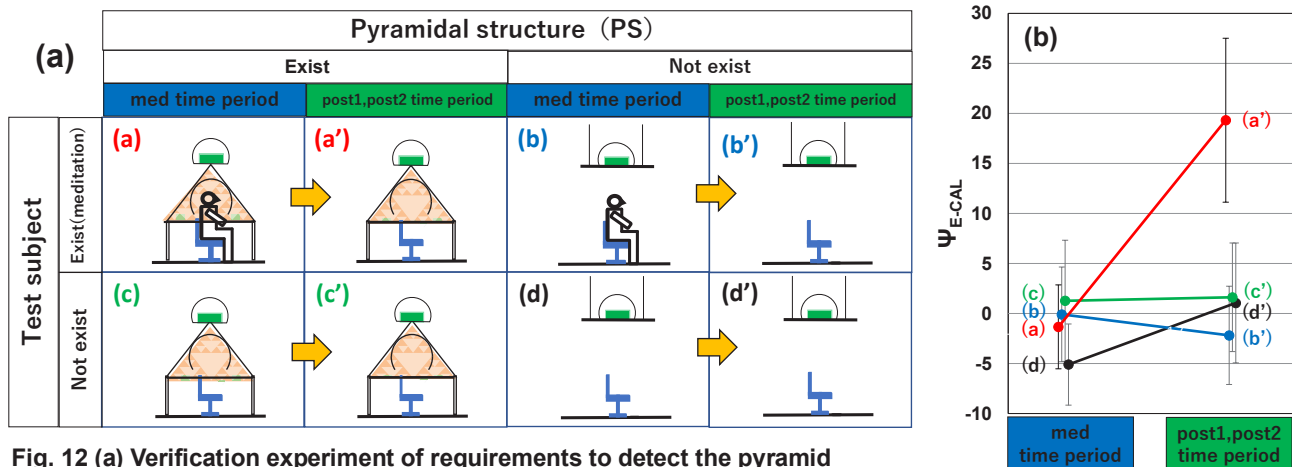


Fig. 12 (a) Verification experiment of requirements to detect the pyramid effect (4 patterns). (b) Results of verification experiment.



meditated or not, the pyramid effect was zero within the margin of error. On the other hand, in the time period of post1 and post2, only the (a') pattern had 5% significant and the pyramid effect was detected, and the (b')-(d') patterns were zero within the margin of error. Error bars are 95% confidence interval. Therefore, within the scope of the verification experiment, it was found that the test subject's meditation inside the PS during the med time period was the only condition for detecting the pyramid effect during the post1 and post2 time periods. However, the number of data for which the average value was calculated was  $n=68$  (max), which was not so many. Therefore, if verification experiments are continued, it is undeniable that the pyramid effect can be detected with experimental patterns other than (a)-(a'). In fact, the pattern of (c)-(c') is the same situation as the experiment of type (ii), and we report in the next section that the pyramid effect was detected for type (ii) ( $n=468$ ).

### 3-2. Experiment of type (ii) results

Figs. 13-15 show the results obtained for the experiment of type (ii) of Fig. 8, that is, the condition in which the influence of the test subject on the PS was excluded. Fig. 13 (a) shows the distribution of  $\Psi_{E-CAL}$  ( $n=468$ ). The dates (horizontal axis) are values from 1 to 366 obtained by starting at 1 and counting from January 1 of each year in which the experiment was conducted. Summer data (red circles) were the results obtained by experiments when the daytime was more than 12 hours. Summer was therefore from the day of the spring equinox to the day of the autumn equinox. The day of the spring equinox when not a leap year was March 20, and the value on the horizontal axis, 81. The day of the autumn equinox when not a leap year was September 23, and the value on the horizontal axis, 267. Analogously, winter data (blue triangles) were the results obtained by experiments when the day length was less than 12 hours. The numbers of data were  $n=252$  for summer data and  $n=216$  for winter data. In Fig. 13 (b), the vertical axis showed the average value of  $\Psi_{E-CAL}$ , and the horizontal axes showed all data, summer data,

and winter data, respectively. Error bars are 99% confidence interval. From this result, the average value of  $\Psi_{E-CAL}$  was positive and there was 1% significance in summer. But, in the case of all data and winter data, the average value of  $\Psi_{E-CAL}$  was zero within the margin of error. Pyramid effect was found to be significant from the results of summer experiments conducted with the influence of the test subject on the PS excluded. Therefore, the existence of the pyramid effect by the potential power of the PS, "pyramid power", was demonstrated. As a result of analysis of variance, the p-value between the summer and winter data was  $p=6.0 \times 10^{-3}$ .

Until now,  $\Psi_{E-CAL}$  was used as an index of the magnitude of the pyramid effect.  $\Psi_{E-CAL}$  is the average value of the pyramid effect for the biosensors placed in two layers at the PS apex. Therefore, next, the pyramid effect for the upper and lower biosensors was analyzed to verify whether there is a difference due to the layer. Fig. 14 (a) shows the results of comparing the average gas concentration released from the upper and lower biosensors ( $n=468$ ). In the case of the biosensors placed at the PS apex, the gas concentration in the upper layer ( $G_{E2}$ ) was higher than that in the lower layer ( $G_{E1}$ ), but in the case of the biosensors placed at the calibration control point ( $G_{E3}$ ,  $G_{E4}$ ,  $G_{C1}$ ,  $G_{C2}$ ,  $G_{C3}$ ,  $G_{C4}$ ), the gas concentration was higher in the lower layer than in the higher layer in all cases. Further, the experimental sample ( $G_E$ ) had a larger difference between the upper and lower layers as compared with the control sample ( $G_C$ ).  $\Psi_{E-CAL}$  has been calibrated for individual differences in cucumber and external environment, but not for differences in layers. Therefore, in order to calibrate the difference between the upper and lower layers of the biosensors placed on the PS apex,  $\Psi_{E-CAL}$  was modified and  $\Psi_{(E-CAL)Layer}$  was introduced (Eq. (4)). As a result of the analysis, a significant difference ( $p=4.0 \times 10^{-7}$ ) was observed between  $\Psi_{1(E-CAL)Layer1}$  and  $\Psi_{2(E-CAL)Layer2}$  (Fig. 14 (b)). It was found that the potential power of the PS exerted different effects, that is, different pyramid effects, on the upper and lower layers of the biosensors placed on the PS apex in two layers. In other words, it was

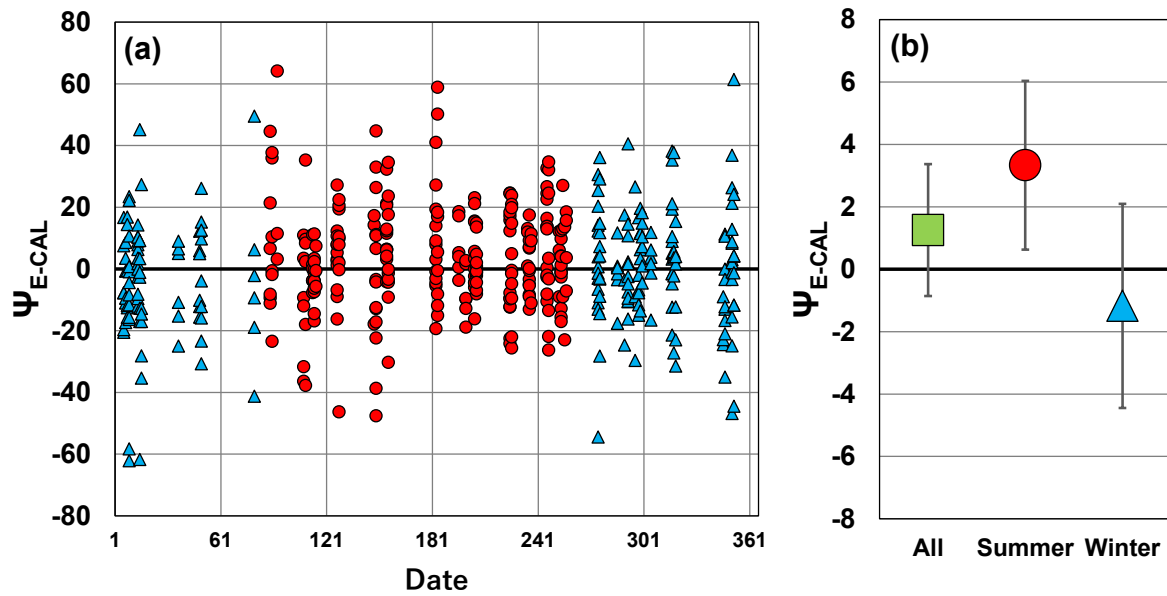


Fig. 13 Results of exclusion of the test subject's influence on the PS.

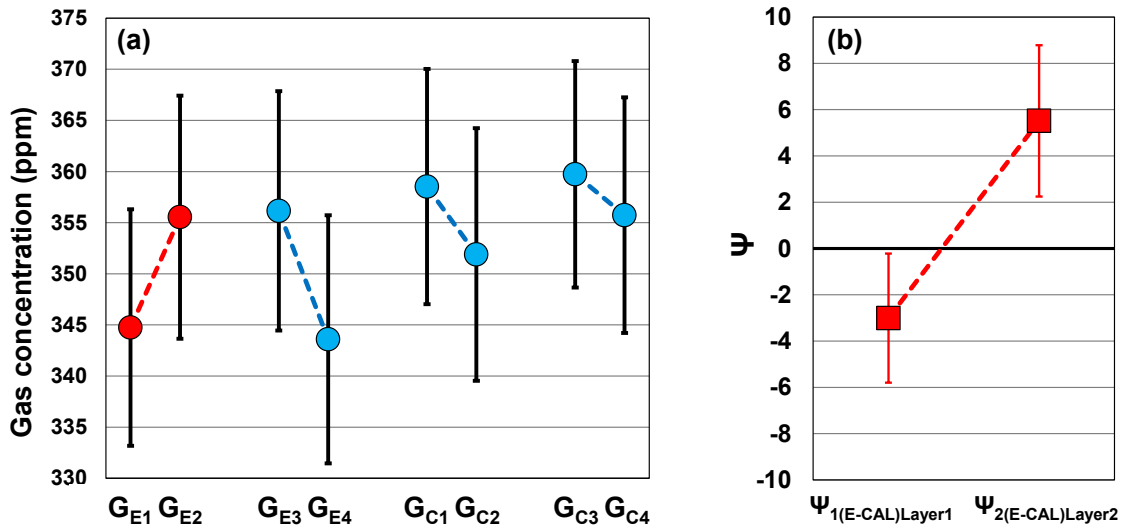


Fig. 14 Comparison of upper and lower biosensors at the PS apex.

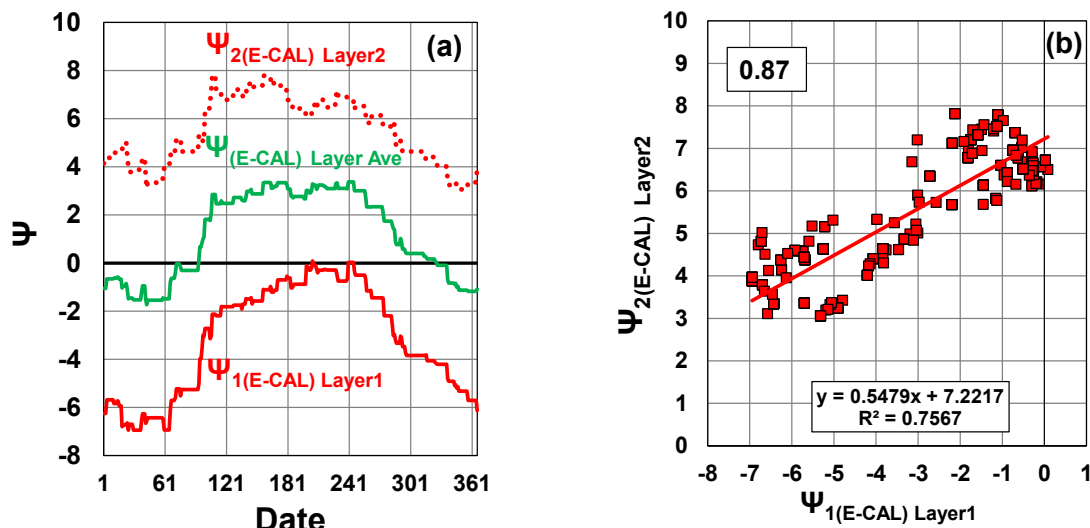


Fig. 15 (a) Moving average. (b) Correlation coefficient between  $\Psi_{1(E-CAL) Layer1}$  and  $\Psi_{2(E-CAL) Layer2}$ .



revealed that a negative pyramid effect appeared for the lower biosensors close to the PS and a positive pyramid effect appeared for the upper biosensors far from the PS. Fig. 15 (a) shows the results of calculating the moving average (window size: 180 days) of  $\Psi_{1(E-CAL)Layer1}$ ,  $\Psi_{2(E-CAL)Layer2}$  and  $\Psi_{(E-CAL)LayerAve}$ . From this result, it was clarified that the pyramid effect due to the potential power of the PS in the upper and lower biosensors has a convex structure in the summer. It was also found that the potential power of the PS affects the biosensors throughout the year in both summer and winter. Fig. 15 (b) is a correlation diagram of  $\Psi_{1(E-CAL)Layer1}$  and  $\Psi_{2(E-CAL)Layer2}$ . Since the numerical value 0.87 at the upper left represents the correlation coefficient, it was found that there is a strong correlation between  $\Psi_{1(E-CAL)Layer1}$  and  $\Psi_{2(E-CAL)Layer2}$ .

#### 4. Conclusion

We have carried out scientifically rigorous experiments and analyzes using the pyramidal structure (PS) to demonstrate the “pyramid power” that has been said to have no scientific basis. As a result, three unexplained functions of the PS have been discovered that are not yet understood in modern science. (1) The pyramid effect that was considered to correspond to the unconscious change from the sleep state to the awake state of the test subject 6 km or more away was detected (1% significance). (2) The pyramid effect was detected for more than 10 days after the test subject meditated in the PS, and the delayed pyramid effect was found ( $p=3.5 \times 10^{-6}$ ). Moreover, this result could be approximated very well by the theoretical curve calculated from the model of the transient response phenomena. (3) The pyramid effect due to the potential power of the PS was detected ( $p=6.0 \times 10^{-3}$ ) in the situation where the influence of the test subject was excluded. In addition, it was found that the potential power of the PS exerted different effects on the upper and lower layers of the biosensors placed on the PS apex in two layers ( $p=4.0 \times 10^{-7}$ ). These results represent

findings from the world's first study to demonstrate the unexplained function, "pyramid power", of the PS by scientific experiments. We expect that this achievement will open up a new field of science and contribute to the development of a wide range of application fields.

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