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Studies of Putative Human Bioenergy Using a Torsion Pendulum with a Metal Chain-Link Support instead of a Nylon Filament Support

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ABSTRACT

Earlier experiments have established that a torsion pendulum consisting of a steel mesh hemisphere suspended by a nylon filament above a human subject is capable of detecting and collecting data that may represent human bioenergy. Among the effects observed are a wide range of subject-induced rotational frequencies of the pendulum and displacement of the pendulum from its natural center of oscillation. The nylon filament support confers the properties of a simple harmonic oscillator (*sho*) to the pendulum. The resulting *sho* swings of the pendulum obscure smaller swings that correspond to subject effects on the pendulum. For this work, it was desired to modify the pendulum to reduce or eliminate the *sho* oscillatory swings. A proposed modification was to replace the nylon filament with a length of chain. The idea was that the chain would confer properties of an 'energy well' to the pendulum. Rotational forces exerted on the chain-supported pendulum would cause the chain to twist and thus rise up the side of the energy well. Ideally, the only restoring force would be the tendency of the twisted links to untwist, so as to drop back down to the bottom of the energy well.

This strategy was successful. Control experiments in which the chain-supported pendulum was stimulated to rotational motion by air puffs showed a rapid deflection of the pendulum, which represented traveling up the side of the energy well. The deflected pendulum then immediately returned to its original position and remained there, with no *sho* oscillations being evident. This is consistent with the chain-link pendulum conforming to the characteristics of an energy well.

The chain-supported pendulum was used to assess subject effects on the pendulum. The basic pattern of the subject effects resembled those obtained with a nylon filament-supported pendulum, except the large *sho* swings that are a feature of the filament-supported pendulum, were absent from the effects observed by the chain-supported pendulum. Thus, for the first time, the pattern of subject-induced effects could be observed, measured, and analyzed without being obscured by *sho* oscillations. Soon after the subject was seated under the pendulum, its rotational motion drove the pendulum rotational position up one side of the energy well, where it stayed throughout the experiment. This establishes that the force is a spiral force, which conforms to our earlier observations. The now-visible underlying subject-induced oscillations are nuanced and sophisticated and are reminiscent of the complexity of music or speech. Moreover, these oscillations encompass a range of very low frequencies, from less than 0.01 *Hz* to 0.15 *Hz*. The frequency amplitudes rise dramatically at the lowest frequencies, suggesting the existence of additional even lower frequencies; but if they exist, the current pendulum cannot detect them. The frequency amplitudes toward the upper end do not fade away completely, suggesting that what is observed represents what there is.

These frequencies are much lower than what is detected by electrodes attached to the scalps of subjects which measure minute voltage fluctuations called 'brain waves.' These voltage-related brain waves range from 0.5-42 *Hz*. Low frequency humpback whale sounds, often attributed to being a means of long-range communication, range from 30-8,000 *Hz*. As far as we know, the low frequencies observed with the chain-supported pendulum are unprecedented.

As of now, the nature and origin of the subject effects measured by the nylon filament and chain-supported pendulums are not known. Accumulating evidence argues that they are not merely subject-induced thermal convection currents, but some other form of energy that originates from the subject. As an energy of very low frequency, it could be expected to propagate over long distances, reminiscent of low frequency whale sounds. This article addresses these and other issues.

Keywords: Psychokinesis; Pendulum measurement of human bioenergy; Human bioenergy as a spiral force; Torsion pendulum and bioenergy

INTRODUCTION

Pendulums have been used since antiquity to sense energy phenomena, including forms of bioenergy. Some suspend pendulums over maps to locate buried treasure. Others use pendulum motions to make choices during daily life. Many uses of pendulums are of questionable value because there is usually little or no attempt to establish that any of these phenomena produce useful information, which would require the tools of the scientific method; the primary tool being the taking of measurements, to obtain data as accurately and precisely as possible. These measurements lead to interpretations of the data, which lead to hypotheses, which lead to additional experiments; and so on.

A useful approach to scientific discovery is to define a 'Model System.' The model system should embody those aspects that you wish to study but do it within a framework that is as simple as possible. Several years ago, we developed a model system to explore putative bioenergy effects exerted by a human subject sitting under a hemispheric steel mesh energy collector. The hemispheric energy collector was suspended by a thin nylon filament (1.75 *cm* long, 0.7 *mm* diameter.) A video camera was focused on a white dot on the side of the energy collector, which permitted high-resolution rotational positions of the hemisphere to be measured and stored for analysis. Since it was suspended by a nylon filament, the hemisphere behaved as a simple harmonic oscillator, *sho*, a type of oscillator whose characteristics are thoroughly studied and understood. It is a torsion pendulum that oscillates rotationally, in which twisting of the nylon filament drives the *sho* oscillations.

We performed hundreds of experiments involving dozens of subjects over several years. Distinct patterns of effects on the torsion pendulum emerged, that were consistent among nearly all subjects tested. Differences were related more to the intensity of the effects, rather than the nature of the effects. This is a partial list of subject effects on the pendulum.

1. Substantial shifts of the center of oscillation of the pendulum, some as large as 2.2 cm (7 *deg*) requiring a force that is equivalent to 45 *mg* were observed.
2. Many new frequencies of oscillation of the pendulum were introduced when a subject was present.
3. Dramatic changes in the amplitudes of oscillation of the pendulum were observed throughout the experiments; increasing, decreasing, and increasing again, in quasi-consistent patterns.
4. These shifts of the center of oscillation, the new frequencies of oscillation, and the changes in amplitudes all persisted for 30-60 min after the subject had left the pendulum. Results from these experiments have been published [1-4]. Several investigators have repeated these experiments; and as far as we know, all have seen similar subject effects on the pendulum. Whereas the patterns of the experimental observations do not seem to be in dispute, the interpretations of the results by some investigators lean toward the effects being the consequence of ordinary thermal convection currents produced by the subject under the pendulum. Several publications represent experiments and arguments on both sides of this issue [5-9]. Recent studies in which a subject sitting beside the pendulum instead of under it showed effects that were similar those while under the pendulum [10], which weakens the argument that the subject effects are the result of thermal convection currents.

In the current work, a departure from our simple model system was explored. This is because the *sho* pendulum has a strong natural frequency that shows up in the data in every experiment. These *sho* oscillations are superimposed on subject-induced oscillations, so inevitably obscure these subject-induced oscillations. Despite this, many subject-induced oscillations and frequencies have been identified and characterized [1,2]. Because subject-induced frequencies are superimposed by the natural *sho* oscillations of the pendulum, it was desirable to modify the pendulum in a way to suppress or even eliminate the *sho* motions of the pendulum. A possible solution to this could be the replacement of the nylon filament support by a support consisting of an appropriate length of chain, composed of links chosen to optimize the attributes contributed by the chain. This is analogous to our earlier search for a nylon support filament to provide optimal results.

The concept underlying the chain, is that instead of the hemisphere being a simple *sho*, the hemisphere's rotational oscillations would be subject to the properties of the links in the chain and the length of chain support. Considering the effect of rotation of the hemisphere, as the chain was twisted; there would be a counterforce that would resist the twisting and tend to restore the chain to the completely untwisted state. This conforms to the concept of an 'energy well,' as depicted in Figure 7, and as you go up the side of the parabolic energy well, there is a force to return to the ground state. If using a chain-link support indeed creates the conditions of an energy well, this could substantially diminish the *sho* characteristics provided by the twisted nylon fiber. Experiments performed using the chain-link support could therefore detect and measure frequencies that are unobscured by *sho* effects.

This results in this paper confirm the suitability of a chain support that can eliminate *sho* effects. An aspect is that many more subject-induced frequencies are revealed in detail. Moreover, they exhibit a broad range of frequencies, especially very low frequencies. The complexity of the frequencies resembles those of recorded music and speech, suggesting they could constitute elements of communication. Claims of communication via bioenergy are commonplace, but there has been little experimental data to support the idea. The chain-supported pendulum could provide access to acquiring these data. All references in this paper are indexed in Google Scholar.

MATERIALS AND METHODS

The model system pendulum used in our earlier experiments to detect and measure subject effects is depicted in Figure 1, and its design and use have been described in detail [1,2,4]. Briefly, it is a 15 x 35 *cm* steel mesh hemisphere (a picnic food cover) suspended by a short length (1.75 *cm* length x 0.7 *mm* diameter) of nylon filament. This fiber and hemisphere combination resulted in a 30 *sec* period of oscillation, or 2 *cpm*. This period of oscillation gave good sensitivity to the effects exerted by subjects with minimal ambient influences. Rotational motions of the pendulum are recorded using a video camera focused on a 1 *cm* white dot on the side of the hemisphere. A computer program determines the center of the dot 10 times per *sec*, displays the data during the experiment and stores the data for later analysis. These measurements are precise, and the rotational position of the pendulum at any time during an experiment is known at a resolution of about 0.1 *mm*. Whereas the pendulum used here is a steel mesh hemisphere, hemispheres of PET plastics and vegetable fiber produced similar results.

This basic model system has been altered in this work by replacing the nylon filament support with a chain-link support. Many chains were explored, consisting of many kinds of links in various sizes, shapes, and lengths. A configuration was identified that possessed the qualities that were desired, which was to create an 'energy well' that would result in pendulum oscillations responding to the dynamics of an energy well, while avoiding *sho* oscillations. A picture of the original nylon filament support is shown in Figure 2. Figure 8 shows the optimized chain support used in these experiments. It was obtained from a local craft/hobby shop and was treated with a Teflon spray (office supply store), to reduce friction at the rotational surfaces of the links. The material of the chain was metal of unknown composition, but it was the size, shape, and number of links that were deemed most important. It was an 11-link chain with 10 twisting surfaces. That this chain-link support conferred the desired properties of an energy well is described in the Results. FFT analyses used Sigview.

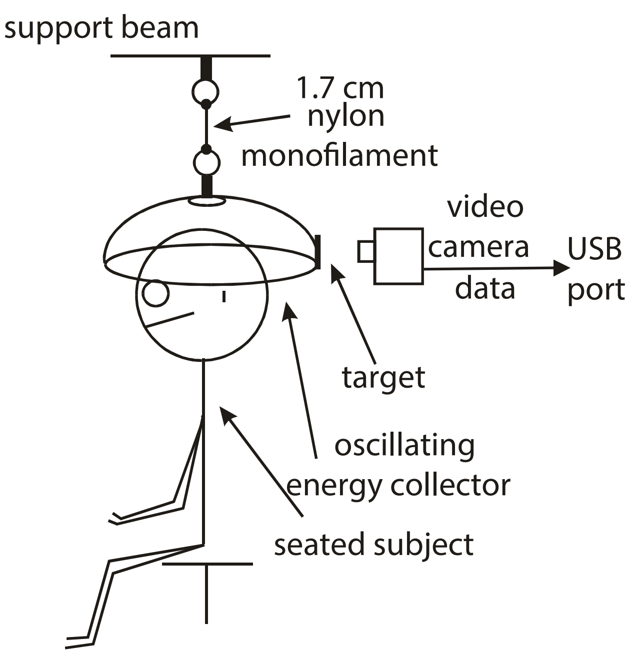

Figure 1: Method of data collection from rotationally oscillating pendulum. A video camera records pendulum positions and saves the data for analysis.

Figure 2: A photo of the 1.7 *cm*x 0.7 *mm*nylon filament used in earlier conventional pendulum experiments.

RESULTS

Figures 3, 4 and 9 compare the characteristics of the original *sho* nylon filament support, with the 'energy well' chain support that was used in these experiments. Figure 3 shows how the *sho* pendulum responds to successive air puffs, in which the puff rotationally deflects the pendulum, which then oscillates while damping down to the center of oscillation. This oscillation was analyzed using FFT (Sigview) to identify any frequencies, as shown in Figure 4. A single large peak was identified, with a frequency of 0.03 *Hz*, or 1.9 *cpm*.

Similar experiments were performed with the same steel hemisphere, but instead of a nylon fiber support, they employed the chain link support shown in Figure 8. The hemisphere was activated to rotatory oscillations using air puffs. The pattern of oscillations before and after the air puffs are shown in Figure 9. After an air puff, the pendulum rapidly returns to its initial position, which corresponds to the bottom of the energy well with no evidence of *sho*-type oscillations. This was confirmed by FFT analysis, which showed no frequency peaks. Comparison of this experimental result with the desired energy well in Figure 7, argues that the chain support has provided a pendulum whose rotational oscillations conform to an energy well, with negligible contributions from *sho* oscillations.

Prior to performing subject experiments with the chain-link support of the steel hemisphere, an experiment using a control subject was performed using the earlier nylon fiber support. The result is shown in Figure 5. It conforms closely to the many experiments that have been reported earlier [1,2]. Once the subject has been seated under the pendulum, it begins to deviate significantly from the

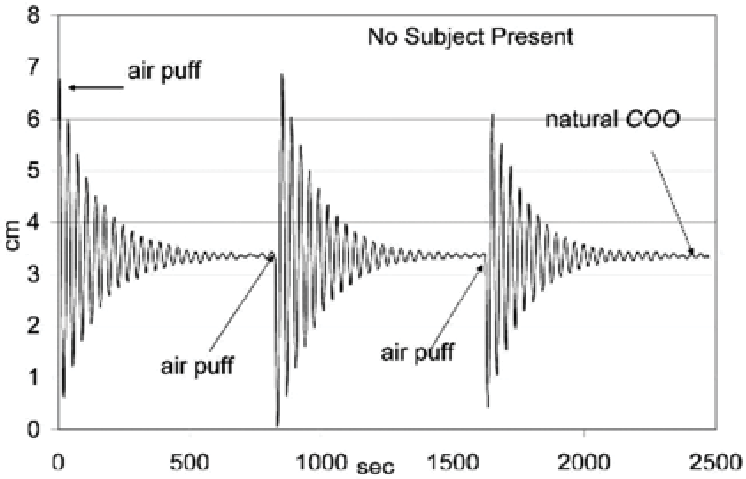

Figure 3: Oscillation of the pendulum when no subject is present. Oscillations are induced by air puffs, followed by a period of damping toward the natural center of oscillation (COO), with no residual effects being discernable.

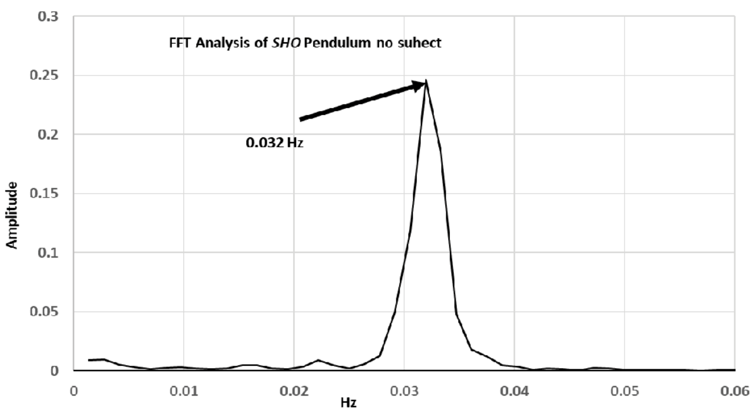

Figure 4: FFT analysis of Figure 3 data. A single frequency peak is observed, at 0.032 Hz, or 1.92 cycles per minute.

center of oscillation, rising to a broad peak and then slowly returning toward the center of oscillation. Significantly strong oscillations persist for 60 *min* after the subject departed the pendulum, which is typically observed. That the pendulum is deflected in just one direction away from the center of oscillation implies that the force on the pendulum is vectored in a spiral fashion, as has been consistently observed [1,2].

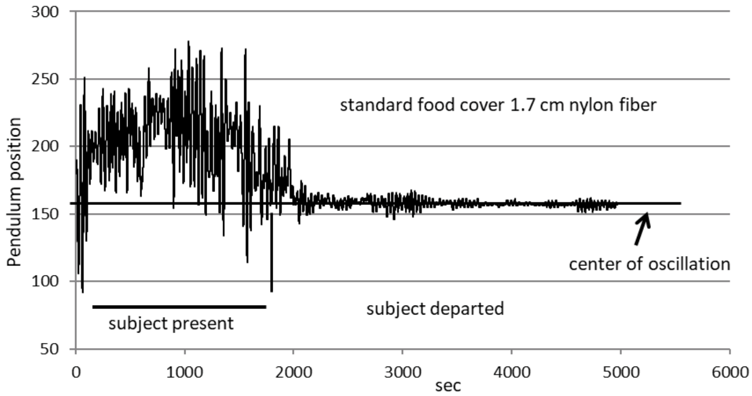

Figure 5: Experimental result using the nylon fiber support shown in Figure 2.

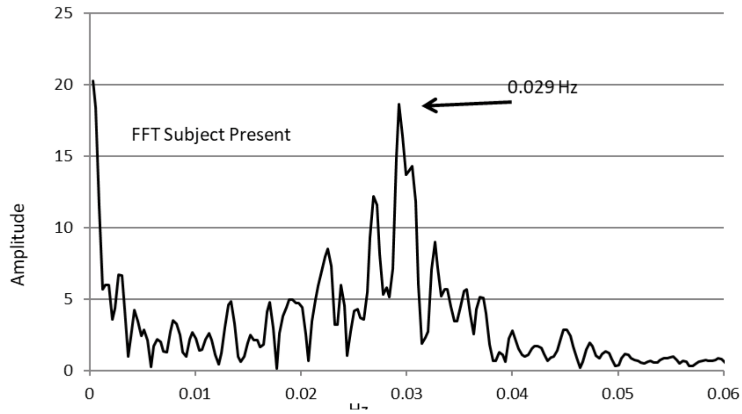

Figure 6: FFT analysis of data in Figure 5.

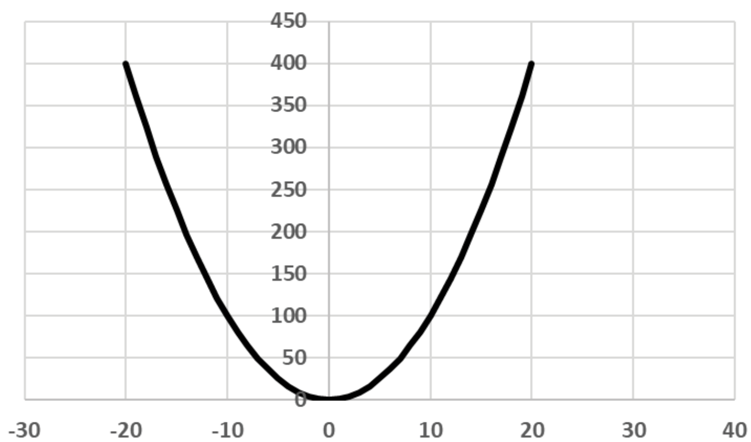

Figure 7: A parabolic energy well.

These oscillations were subjected to FFT analysis to identify frequency peaks, shown in Figure 6. As is typical of these *sho* experiments, a major frequency peak is shown at 0.029 Hz, which is the *sho* frequency of the pendulum. This frequency is surrounded by many frequencies, both above and below the *sho* frequency of the pendulum. The strong amplitude of the *sho* frequency suggests that weaker subject-induced frequencies may be obscured, and that if the dominant *sho* frequency could be suppressed, weaker frequencies would be revealed.

This was tested using the same subject, but instead of the nylon filament support; the Figure 8 chain-link support was used. The result is shown in Figure 10. The strong *sho* oscillations of the nylon filament experiment are absent, and what is revealed is a pattern of oscillations with many new frequencies that would have been obscured by *sho* oscillations. The pattern of a rise and fall of deflections from the center of oscillation is retained but is overlaid by a much more nuanced and sophisticated pattern of oscillations. As with the nylon filament experiments, this chain-link experiment shows the pendulum deflected consistently against just one side of the energy well, which confirms a spiral force. Now that the *sho* oscillations have been eliminated, the spiral nature of the force is more evident.

FFT analysis in Figure 11 shows that there is a range of frequencies, both above and especially below, the natural *sho* oscillation frequency of the nylon fiber support shown in Figure 6. This argues that once the *sho* oscillation frequencies have been eliminated, one can more closely examine and interpret the subject-induced frequencies without being obscured by *sho* frequencies.

The frequencies detected using the chain-supported pendulum range from less than 0.01 *Hz* to 0.15 *Hz* and are diminished, but not gone, above 0.15 *Hz*. That the amplitudes of the lower frequencies steadily increase toward the lower end of the frequency range suggests that even higher-amplitude lower frequencies could be present, but the pendulum is not capable of detecting them. To explore any lower frequencies would require a modified design of the pendulum, or perhaps something other than a pendulum. The fact that the higher

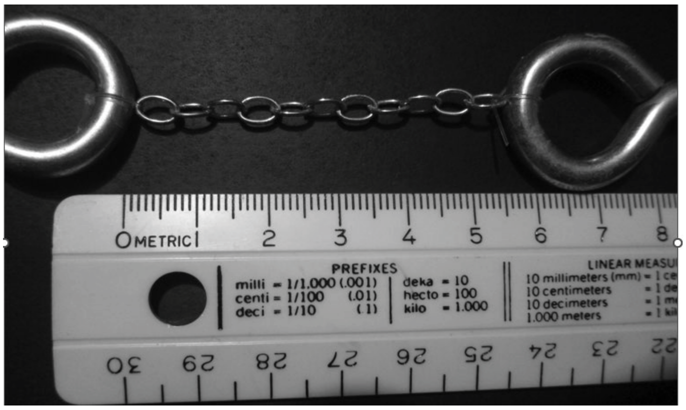

Figure 8: A 5.5 *cm*11-link metal chain with 10 twisting surfaces.

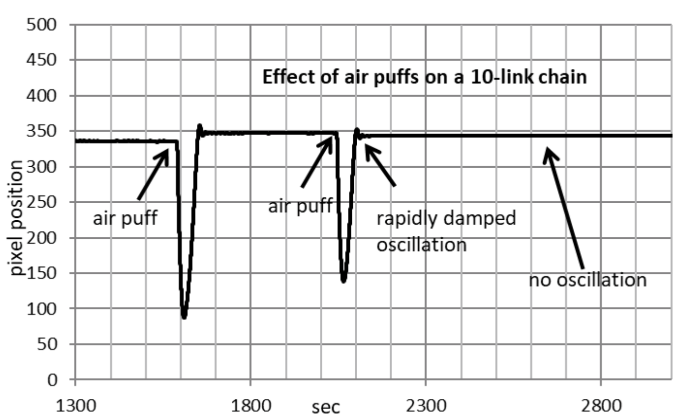

Figure 9: Effects of air puffs on the pendulum with the 11-link chain support in Figure 8.

frequencies do not disappear suggests that they can be detected by the pendulum, but they are of modest amplitude.

These frequencies can be compared with the well-studied frequencies of human 'brain waves' that have been detected, measured, and analyzed using electrodes pasted to the scalps of subjects, which detect minute voltage oscillations. These voltage measurements are distinctly different from physical forces exerted on the chain-supported pendulum. Voltage-related brain waves are identified as Alpha, Beta, Gamma, Theta, Delta, respectively. Gamma waves are 38-42 *Hz*, Beta 12-38 *Hz*, Alpha 8-12 *Hz*, Theta 3-8 *Hz*, Delta 0.5-3 *Hz*. These brain wave frequencies have been correlated with states of cognitive awareness with the higher frequencies associated with states of being awake and aware, and the lower frequencies related to relaxed, meditative, and sleep states. These can be compared to 'low frequency whale sounds' which are 30 Hz to 8,000 Hz for humpback whales.

The chain-supported pendulum detects frequencies that are much lower than recognized brain waves. Instead of ranging from 0.5-42 *Hz* for brain waves, they range from less than 0.01-0.15 *Hz* for the chain-supported pendulum. The difference between the lowest Delta frequency of 0.5 *Hz* and the lowest chain pendulum of less than 0.01 *Hz* is a factor of 50. It could be an even greater difference, if there are even lower frequencies that the chain-supported pendulum cannot measure. Since both methods measure something, it seems that what the brain waves measure and what the chain pendulum measures are substantially different in their origin, nature, and probably significance.

The experiment with the chain-link support was repeated, using the same subject. The results of the repeat experiment are shown in Figure 12. Although similar to the result in Figure 10, there are differences in the details of the rise and fall of the deflections from the bottom of the energy well. However, both show similar sophisticated patterns of oscillations superimposed on the main signal. FFT analysis of Figure 12 is shown in Figures 13 and 14] the difference between Figure 13 and 14 being Figure 14 has an expanded amplitude scale. The two amplitude scales emphasize the lower frequencies [Figure 13] and the higher frequencies [Figure 14], respectively.

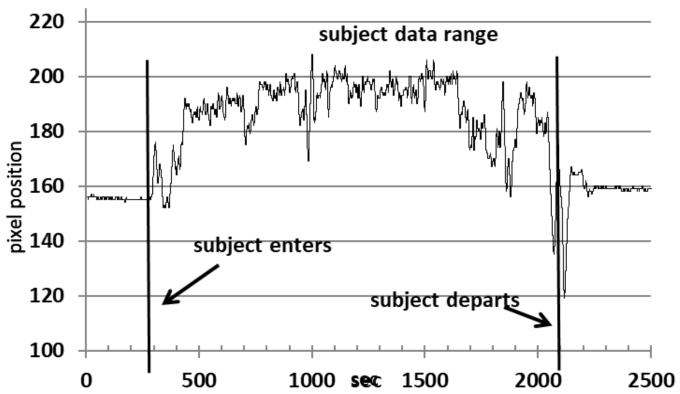

Figure 10: Experiment using the 11-link chain support with 10 twisting surfaces.

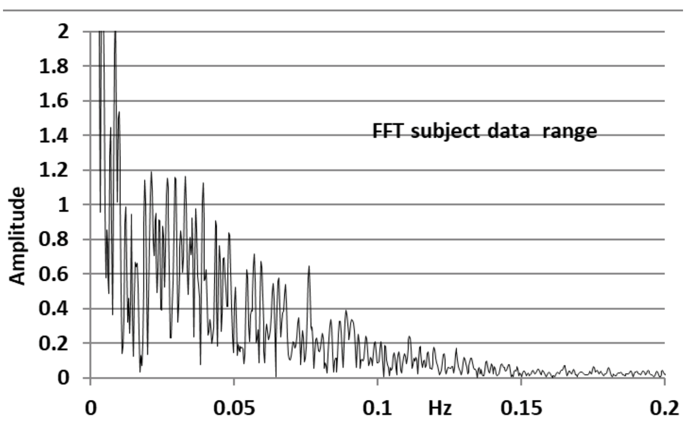

Figure 11: FFT analysis of during the time the Figure 10 subject was present under the pendulum.

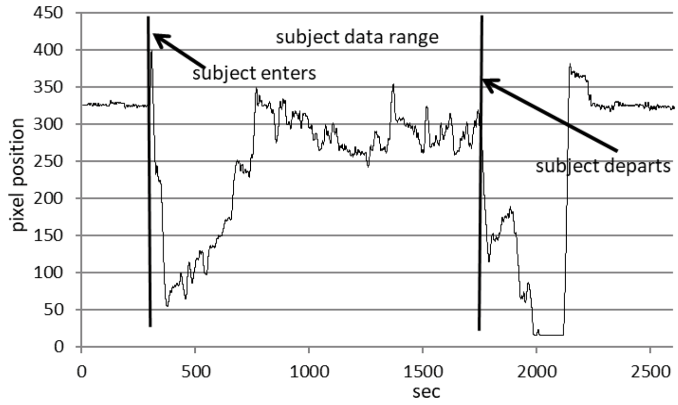

Figure 12: Experiment using the Figure 8 11-link chain support.

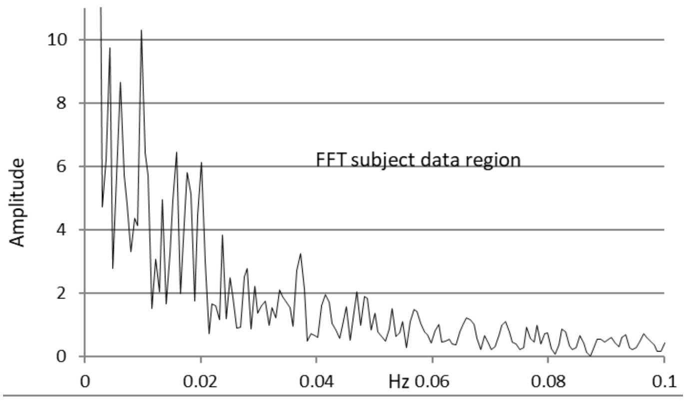

Figure 13: FFT analysis of Figure 12 when the subject was present.

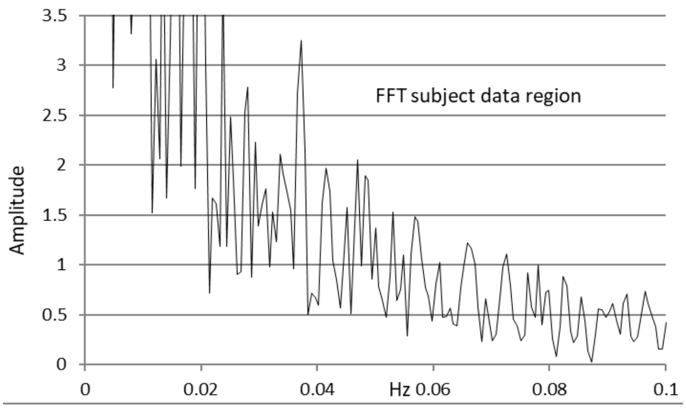

Figure 14: As Figure 13, with an expanded vertical scale.

The Figure 12 experiment was also analyzed with respect to the 60 *min* after the subject had departed from the pendulum. This data region is shown in Figure 15, and the FFT analysis is shown in Figure 16. Although the amplitudes of the post-subject oscillations are diminished compared to when the subject was present, the amplitudes of the many frequencies shown in Figure 16 are substantial, and comparable to the subject-present FFTs of Figures [13,14]. It has been noted that the pendulum hemisphere consists of an open mesh, which can be expected to allow the dissipation of any subject-

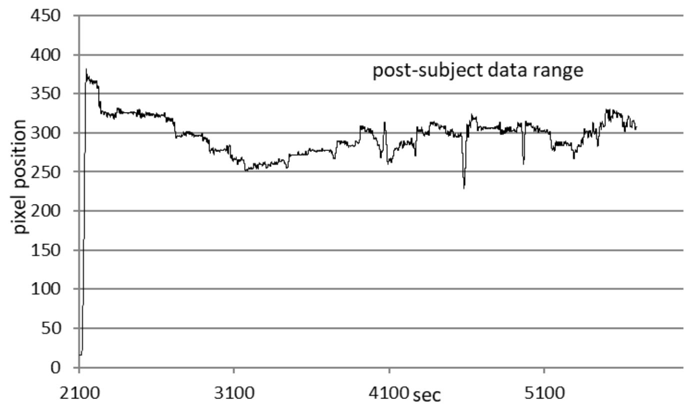

Figure 15: Pattern of pendulum oscillations during the 60 minutes after the Figure 12 subject departed the pendulum.

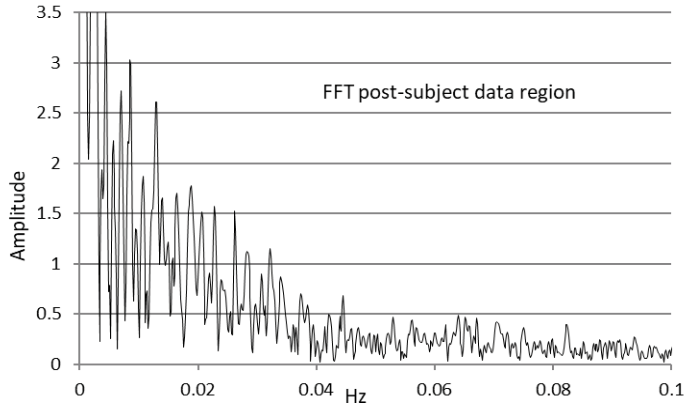

Figure 16: FFT analysis of pendulum oscillations during the 60 minutes after the subject departed the pendulum in Figure 12.

induced thermal convection currents. That this probable dissipation does not result in diminishing the effects during the 60 *min* post-subject period again argues that the post-subject oscillations are not caused by residual thermal convection currents. An alternative interpretation is that the energy frequencies imposed on the pendulum by the subject are somehow retained within the steel mesh hemisphere and continue to manifest their presence by their effects on the pendulum. This is consistent with many anecdotal claims that the energetic effects of, say, angry people in a room can affect the ambiance of the room after they have left.

DISCUSSION

Previous experiments using a rotational torsion pendulum suspended by a nylon filament were successful in detecting putative human bioenergy effects exerted by human subjects sitting beneath the pendulum [1,2]. The nylon filament results in classic simple harmonic oscillator *sho* characteristics so that the *sho* oscillations are superimposed on the subject effects. Despite this, the ability of the *sho* pendulum to detect subject effects to provide data for analysis was impressive and useful [1,2].

The goal of the experiments in this paper was to explore modifications of the pendulum to eliminate the *sho* effects, and to reveal the subject data without being obscured by *sho* oscillations. It was decided to replace the nylon filament with a carefully chosen length of chain. The concept behind the choice of a chain support is that the chain would confer the properties of an 'energy well.' As any rotational motions of the pendulum occurred, the links of the chain would be twisted, which would result in a force to return to the untwisted state. In principle, this should not initiate *sho* oscillations, but just provide a force to return the chain to its completely relaxed state, which is at the bottom of the energy well. A search for a length of chain that would produce the desired result was undertaken. Many chains consisting of links of a variety of sizes, shapes, and composition were tested. The candidate that was selected is shown in Figure 8. It is an 11-link chain with 10 twisting surfaces. Friction among the surfaces was minimized using a Teflon spray.

A classic parabola shaped energy well is shown in Figure 7. Figure 9 demonstrates that when air puffs deflect the pendulum, it rapidly returns to its ground state at the bottom of the energy well, and the return to the bottom of the energy well is devoid of *sho* effects.

The excellent qualities of the chain-link support were verified using the chain-link-supported pendulum to detect and quantify the effects while a subject was seated beneath the pendulum [Figures 10-16]. Especially telling is a comparison of subject data using the *sho* torsion pendulum in Figure 5, and the chain-link pendulum, Figure 10. The Figure 6 FFT analysis of the Figure 5 data shows a strong superimposition of *sho* oscillations, whereas both Figure 10 and the Figure 11 FFT analysis show that the position of the pendulum does not exhibit *sho* oscillation effects, so that the motions of the pendulum reflect only subject-induced effects.

These results using a chain-link pendulum support the idea that there is a putative form of human bioenergy that can affect the rotational motions of a pendulum suspended above a human subject. These effects have been attributed by some to cranial thermal convection currents. Although difficult to eliminate completely, that a subject seated a distance away from the pendulum still affects the pendulum weakens the argument significantly [10]. It is suggested here that the subject energetic effects are somehow absorbed and retained by the hemispheric steel-mesh pendulum, which continues to oscillate in response to that energy; despite the subject having left the pendulum an hour previously. What the nature of this energy is, and how the retention of this energy is possible will require further study. Some of these experiments were inspired by philosophical ideas that were developed and described in 'Treefall' [11,12].

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