Experimental

SOME HEAT EXPERIMENTS IMPLICATING THE EXISTENCE OF A SUBTLE ENERGY

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ABSTRACT

Wilhelm Reich claimed that there existed a cosmic energy, orgone which could be accumulated in a wooden cabinet lined with sheet metal. The experiments in this paper utilized an orgone accumulator (Orac) made from a sheet metal funnel surrounded by sawdust in a cardboard box. The non-Orac control was a similar-sized plastic funnel also surrounded by sawdust and sitting next to the Orac in the same box. The relative responsiveness of the Orac and non-Orac to the heat of a warming plate was investigated in 4 experiments.

On initial exposure to the heat from the warming plate in Experiment 1, the temperature of the Orac (T1) rose more quickly than that of the non-Orac (T2). This was because the metallic funnel was more reactive to heat than the plastic one. T1 also cooled down faster than T2 when the heat was shut off because the metallic funnel was more reactive to heat loss. In this experiment, T1, T2 and T1-T2 (Td) correlated significantly positvely with each other.

In contrast to Experiment 1, where the heat was switched off when T1 and T2 reached a maximum, the warming place in Experiments 2, 3 and 4 was left on for 39 days, 36 days, and 22 months respectively. In these 3 experiments, T1 and T2 correlated significantly positvely with each other as in Experiment 1. However, in contrast to Experiment 1, Td correlated significantly negatively with T1 and T2 in Experiments 2, 3 and 4, indicating that T1 was less reactive than T2, an anomalous finding explained by implicating the cosmic orgone energy. Experiments were also conducted in which Td was used to measure local variations in the cosmic orgone as well as more distant ones, for example, those possibly related to distance from the sun.

KEYWORDS: Thermal, orgone energy, paradigm, thermodynamic

INTRODUCTION

The idea that there exists a subtle energy associated with life is very old and widespread among many cultures. The recent growth of complementary therapeutic practices prompted a resurgent interest in the existence of such an energy in our own time. I became involved in studies with healers because of my interest in a subtle energy[1,2] but even before that involvement, I had conducted experiments on such an energy; some of these experiments will be described in this paper.

These studies were prompted by my interest in the work of Wilhelm Reich who claimed that there existed a bioenergy of cosmic origin.[3,4] He claimed that a cabinet made of wood, or other non-metallic material and lined with galvanized iron, accumulated an energy from the atmosphere which he called orgone energy. Part of Reich's evidence that the metal-lined cabinet was an orgone accumulator (orac) was that the temperature above the apparatus was higher than that of the surrounding air and various other controls.[5] Of particular relevance to the experiments described in this paper was his claim that the temperature difference between the orac and non-orac was greater in sunlight than in the shade.

I subsequently undertook experiments in which an orac and a non-orac were warmed by a heating plate, and attempts were made to explain the results by the conventional paradigm and the energetic one to see which would better explain the findings. This was one way of examining Reich's claim that the orgone energy does in fact exist and that it can be accumulated by an enclosure made of wood and lined on the inside with sheet metal.

METHODS

In all the experiments of the present study, two conical funnels, one of galvanized iron and the other of plastic (polystyrene), both of identical size and shape, were placed upside down and side by side in a corrugated cardboard box, the bottom of which was 1.9 cm thick (Figure 1). A thermometer calibrated to 0.05°C was inserted into the stem of each funnel and the top of the thermometer bulb was positioned just below the point at which the

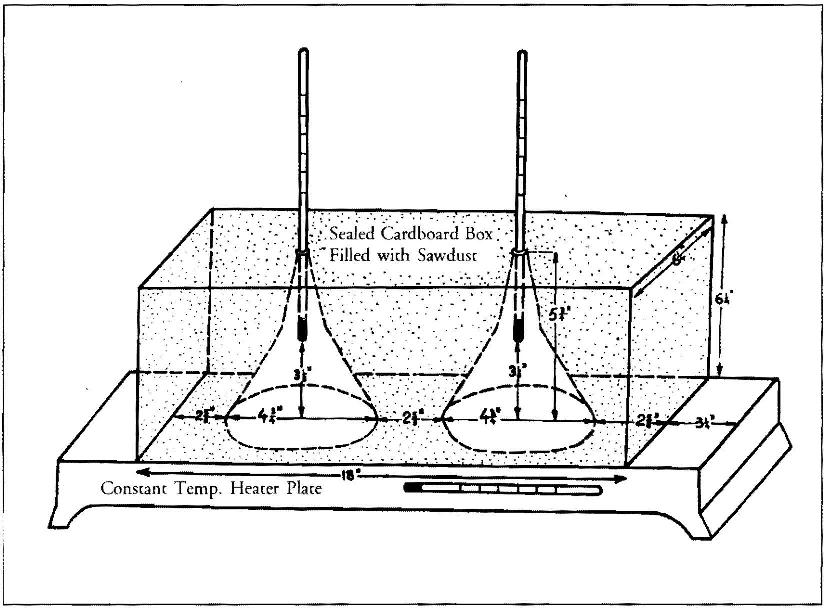

Figure 1. The apparatus used in this study involved 2 funnels, a metallic one and a plastic one, sitting in a cardboard box filled with sawdust. Thermometers were passed through the neck of each funnel, positioned as indicated in the figure, and attached to the stem with adhesive tape. The cardboard box was positioned on a heating plate whose temperature could be raised from room temperature to 50°C and lowered back to room temperature.

stem and the funnel met which was about 7.8 cm above the bottom of the box (Figure 1). Adhesive plaster attached the thermometers to each stem, closing the stem and simultaneously holding each thermometer in place without touching the walls of the funnel. Sawdust was poured into the cardboard box, completely covering both funnels and their stems on the outside but not on the inside. That is, there was only air inside the funnels. The two upper flaps of the cardboard box were then sealed with adhesive tape while allowing the thermometers to exit from the top of the box, permitting readings to be taken. The box was then placed on top of a copper plate uniformly heated by a series of resistance coils. The metallic funnel surrounded by sawdust was an orac, according to Reich, while the plastic funnel was not.

Reich observed that the temperature difference between an orac (To) and its control (T) was greater in the sun than in the shade and greater outside than inside a room because of "secondary orgonotic radiation from walls, table tops, etc."[5] Indeed, our experience, as well as that of others,[6] with various *unheated* oracs and control devices located indoors frequently yielded negative To-T readings. Nevertheless, our experiments conducted indoors yielded interesting results when the orac and non-orac were simultaneously heated by an electrically heated copper plate. This was an attempt to mimic to some degree the excitation produced by the sun.

Experiments 1, 2 and 3 were conducted in a well-insulated room of about 25-30 square meters whose only access to the outdoors was via a sliding panel on a small window of about 375 sq. cm. A door opening into a hallway provided access to a hallway. The experimental room was on the top floor of a 3 story stone building situated on the side of a hill about 120 meters above sea level in Montreal. Except when personnel entered or left the room, the door was kept closed throughout the 3 experiments. The sun's rays had no direct access into this room and the box containing the 2 funnels was so positioned that neither funnel would be more influenced than the other by air entering the room via the window or the door. The radiator which normally heated the room was closed.

RESULTS AND DISCUSSION

Changes in the Temperature of the Air In a Metallic and in a Plastic Funnel Brought on by an Electrically Heated Copper Plate (Experiment 1)

The purpose of this experiment was to provide a basis for comparison with the other experiments to be conducted in this study. This experiment was begun with the thermometers in both funnels and that on the copper plate all at room temperature, that is, around 25°C. Before the switch was turned on, the thermostat on the copper plate (Tpl) was adjusted so that the temperature would rise till it reached 50°C, at which degree Tpl would be maintained until the switch was turned off. When the switch of the copper plate was turned on, Tpl rose and so did the temperature in the funnels, the air in the metallic funnel (T1) heating up faster than the air in the plastic one T2). Consequently, T1-T2 (Td) also increased as Tpl increased.

When the heating plate reached 50°C, it was turned off, Tpl started to decline immediately but T1 and T2 continued to rise for some minutes. In one experiment, T1 continued to rise for 9 minutes and T2 for 30 minutes (Figure 2). When TI and T2 finally began to decline after the switch was turned off, T1 declined faster than T2, and therefore, Td also declined (Figure 2). The greater variability of T1 than T2 in this experiment was also shown by the twice higher standard error of T1 than T2 when the funnels were warming up (0.9°C vs 0.4°C) and also when cooling down (0.4°C vs 0.2°C). That is, T1 was more reactive than T2 to changes in Tpl. This is in accordance with conventional expectations.

The fact that T1 fell faster than T2 when the switch was turned off indicates that T1 must have been losing heat faster than T2 even during the time when the switch was turned on. Therefore, the more rapid increase in T1 than in T2 when the switch was turned on, must have been due to a cause or causes which more than compensated for the simultaneous greater tendency for T1 to lose heat more rapidly than T2.

The temperature of the sawdust around the funnels was somewhat lower than that of the air within the funnels, all temperature determinations being made equidistant from the bottom of the box. In several trials, it took less than 20 minutes to reach a Td value of more than 2°C after the plate's switch was turned on, but it took considerably longer after the switch was turned off for Td to return to the pre-heating level (Figure 2).

The determinations in this experiment were made with the position of the thermometer bulbs 7.8 cm above the bottom of the box (Figure 1). When this distance was decreased to 5.3 cm, Td still varied between 2.1°C to 2.5°C and when the distance was further decreased to 2.9 cm from the bottom of the box, T1 continued to remain higher than T2 by 1.2°C to 1.5°C. That is, when positioning the thermometer bulbs closer to the heated copper plate, T1 still remained considerably higher than T2.

T1 remained similarly higher than T2 whether the position of the funnels on the heating plate were changed by turning the cardboard box around on the plate

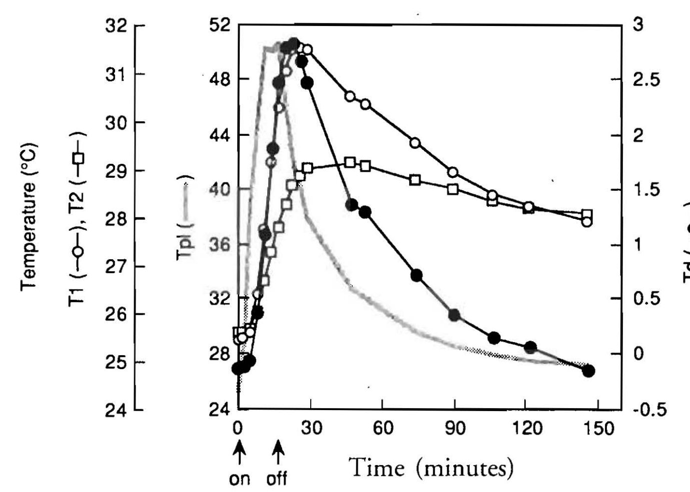

Figure 2. The effect of raising the temperature of the heating plate (Tpl) to 50°C, and then immediately lowering it back to room temperature, on the temperature of the air in the metallic funnel (T1), the air in the plastic funnel (T2) and the temperature difference between them (Td).

or whether the position of funnels were interchanged within the box without turning the box around on the plate or whether the thermometers in the funnels were interchanged without changing the position of the funnels on the plate.

Each of the correlation coefficients between Tpl, T1, T2 and Td were all positive and statistically significant (Table I). This experiment was repeated with the same results.

This experiment was conducted to demonstrate the common experience of the more rapid conduction of heat by metal than plastic. That is, the results of this experiment are readily explicable by conventional ideas of heat transfer. However, they can also be explained by assuming that the metallic funnel surrounded by sawdust is more reactive to heat than the plastic funnel because

Table I
The Correlation Coefficients Between the Temperature of the Air in the Metallic Funnel (T1), the Air in the Plastic Funnel (T2), the Temperature Difference Between Them (Td) and the Temperature of the Heating Plate (Tpl) in Experiment 1

	T1	T2	Td
During Heating			
T2	1.000		
Td	1.000	0.999	
Tpl	0.775	0.763	0.785
During Cooling			
T2	0.939		
Td	0.966	0.817	
Tpl	0.849	0.626	0.949

Table I. The correlation coefficients between T1, T2, Td and Tpl are all highly significant ($p < 0.001$).

the former, being an orac, contains within its space more energy than that of the plastic funnel. However, on the basis of this experiment alone, it would be unreasonable to give more support to one explanation than the other. Therefore, a decision on this question would have to be delayed until more critical data became available.

Temperature Changes of the Air in a Metallic and Plastic Funnel Sitting on a Copper Plate Maintained at 50o C-for 39 Days (Experiment 2)

In Experiment 1, the copper plate was allowed to warm the funnels for less than 20 minutes. In Experiment 2, the heating plate, still thermostatically set at 50° C, was switched on and left on for 39 days from November 29, 1951 to January 6, 1952, during which time T1, T2 and Tpl readings were taken continuously.

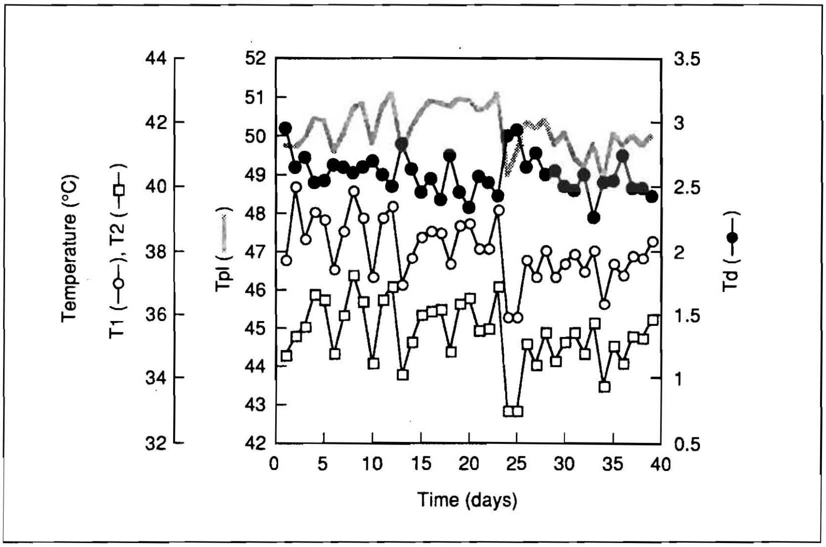

Figure 3. The variation of the temperature of the air in the metallic funnel (T1), the air in the plastic funnel (T2) and the temperature difference between them (Td) when the box containing the funnels was maintained continuously on a heating plate set at 50°C for 39 days.

The question this experiment was designed to answer was what would be the behaviour of T1, T2 and Td under the conditions of continuous heating for several weeks.

The mean and standard error of T1, T2, Td and Tpl respectively during these 39 days was 38.13 ± 0.06°C, 35.54 ± 0.06°C, 2.59 ± 0.01°C and 50.2 ± 0.04°C. T1 was very significantly higher than T2 (Figure 3, $p < 0.001$, $n = 237$). Figure 3 shows that a temperature difference of more than 2°C was maintained for 39 days during which time 239 readings were taken. (Note that in presenting the results in Figure 3, the results for each of the 39 days of the study were averaged for clarity of presentation. The number of readings taken per day in this study ranged from a minimum of 2 to a maximum of 12 with an average of 6).

That T1 remained well above T2 for 39 days without showing a tendency to equalization even though the two funnels were close to each other is explic-

Table II
The Correlation Coefficients Between T1, T2, Td and Tpl in Experiment 2

	T2	Td	Tpl
T1	0.977	-0.427	0.760
T2		-0.557	0.759
Td			-0.356

Table II. T1, T2, Td and Tpl are defined in the heading of Table I and in the text of the paper. The correlation coefficients between T1, T2, Td and Tpl are all highly significant ($p < 0.001$).

able by Reich's orgone physics as well as conventionally. Further study is required to decide the issue.

Another unexpected and anomalous finding was observed in Experiment 2. Because the changes T1, T2, Td and Tpl correlated positively with each other in Experiment 1 (Table I) and were in agreement with established heat principles, it was expected that in Experiment 2, T1, T2 Td and Tpl would also correlate positively with each other. This was true of the correlation coefficients between T1, T2 and Tpl, which remained very significantly positive (Table II). However, the correlation coefficients of Td vs T1, T2 or Tpl, were *very significantly negative* (Table II). That is, in Experiment 2, the changes of Td in reaction to changes in T1, T2, TpI were the *opposite* to those observed in Experiment 1. This was also apparent from an examination of Figure 3.

From the (Experiment 2) negative and highly significant correlation coefficients between Td on the one hand and T1, T2 and Tpl on the other, and also from an examination of Figure 3, it was clear that Td varied inversely with T1, T2 and Tpl. Even Tpl which served to maintain the temperature of the funnels correlated negatively and significantly with Td; changes in Tpl under these conditions were influenced not by any resetting of the thermostat on the warming plate but by changes in room temperature.

It was observed in Experiment I that when the funnels were heated up or cooled down as a consequence of changes in Tpl, T1 was more responsive than T2. This was shown by the higher T1 readings than for T2 and by the standard errors which were twice the magnitude for T1 than for T2. However, this was not the case in Experiment 2. For example, the over-all standard error of all the 239 readings of T1 taken during the 39 days of the study were the same as that of T2 (0.06°C); that is, the standard error of T1 was not higher than that of T2 as observed in Experiment 1. Also, the standard error for each day was lower 29 out of 39 days for T1 than for T2. *That is, T1 was not more variable under these conditions than T2: indeed, T1 appeared to be less variable on most days of this experiment.*

Inasmuch as the conventional explanation of the greater heat conductivity of metal relative to plastic could not explain the anomalous behaviour of T1 relative to T2 one, an alternative explanation was required. This will also involve energetic considerations and will be provided following Experiment 3.

The Effect of Opening and Closing a Window on the Air Temperatures Inside a Heated Metallic Funnel and a Heated Plastic One (Experiment 3)

Reich claimed that the orgone was present everywhere and that it penetrated all matter.[7] The changes in Td observed in Experiment 2 were assumed to be due to the variations in cosmic orgone energy which penetrated the room where the funnels were located. The hypothesis tested by Experiment 3 was that the rate of penetration of the orgone from the outdoors into a room was faster when there was no obstacle to its passage, such as a closed window. That is, the glass in the window, and by extension other materials of the building, while penetrable by the orgone, nevertheless slow down the energy's passage from outdoors to the indoors. If this were so, the magnitude of Td indoors, our measure of the amount of orgone, should be less when the window was closed than when it was open. (It was assumed that on most occasions there was less orgone indoors than in the immediate surroundings outdoors because it was more readily discharged indoors by impacting on walls and other objects and less readily replenished than outdoors). On the other hand, inasmuch as conventional heat theories do not take into account the existence of the orgone, classically-oriented physicists would deny that there should be any differences between Td with the window closed as compared with it open.

To test which hypothesis was correct under these conditions, the following experiment was conducted for 36 days in March, May and June 1952, utilizing the same apparatus in the same room as described earlier (Figure 1). During this time, readings of T1 and T2 were taken several times a day with the window opened for about 1 or 2 hours (and sometimes longer) and then again with the window closed for similar lengths of time. The window was kept open overnight 31 of the 36 days of the study.

The mean and standard error of temperature difference in the metallic funnel between the window closed and window open conditions was 0.21 ± 0.03°C and in the plastic funnel was 0.31 ± 0.03°C, a highly significant difference in each case ($p < 0.001$, $n = 158$). That is, in both the metallic and plastic funnels, closing the window resulted in an increase in temperature relative to that which existed with the window open. However, the change was significantly greater in the case of the plastic funnel than in the metallic funnel as revealed by a t test on the paired differences ($p < 0.001$, $n = 158$). That is, T2 showed greater changes than T1 and this was again contrary to conventional ideas of heat transfer.

Furthermore, when the position of the window was changed from open to closed in this experiment, the correlation coefficient between the changes in Td and T1 was -0.385 ($p < 0.001$, $n = 157$) and between Td and T2 was -0.581 ($p < 0.001$, $n = 157$). In both cases, Td varied inversely as TI and T2 which is contrary to expectations of conventional ideas on heat transfer as seen in Experiment 1. Also, these negative correlation coefficients in Td relative to T1 and T2 under conditions involving opening and closing the window confirmed the findings observed earlier in Experiment 2 (Table II).

Moreover, under these conditions, the correlation coefficient between Td and TI, which was -0.385, was significantly less than the correlation coefficient between Td and T2, which was -0.581 (p almost equals 0.02) That is, changes in energy level (Td) correlated better with the temperature changes in the plastic funnel (T2) than in the metallic one (TI) in Experiment 3. That is, T2 was more reactive than T1 under the conditions of this experiment, again contradicting conventional expectations.

There was a problem in reporting the means and standard errors of the T1, T2 and Td values in the 159 trials in this experiment. Almost every reading taken with the window open was followed by another reading taken with the window closed, which in turn was paired with a subsequent reading taken again with the window open and so on until 159 comparisons of T1 and T2 were made. This meant that each reading was involved twice, once with the reading preceding it and again with the one following it. However, a reading taken at the beginning of the day was involved only once, that is, with the subsequent reading, there being no preceding reading available for that day. Similarly, a reading taken at the end of the day was also involved only with the preceding reading but not with a subsequent one.

Reporting all the T1, T2 and Td values under these conditions would have yielded means that would have been skewed because a few values were utilized once while most were utilized twice. The distortion in the standard errors would also have been considerable because of the duplication of most of the observations. However, it was possible to obtain some idea of the original values of T1, T2 and Td by reporting each value just once instead of twice. This had the disadvantage of reducing the number of observations from 159 to 81.

These values indicated that T1 with window open was lower than T1 with window closed (38.55 ± 0.11°C vs 38.85 ± 0.11°C, p almost equals 0.05) and similarly for T2 (36.15 ± 0.13°C vs 36.57 ± 0.13°C, $p < 0.05$). However, these probabilities did not accurately reflect the very high significance of the differences observed between the original 159 pairs reported earlier when tested by "Student's" t test. Moreover, Td was higher with window open than with window closed (2.40 ± 0.05°C vs 2.28 ± 0.05°C). As in Experiment 2, Td remained consistently positive throughout the entire experiment.

The results also showed that of the 159 readings taken, Td was less 134 times, or 84%, with the window closed than with the window open. Only 14 times or 9%, was Td greater with the window closed than with the window open and 11 times, or 7%, there was no difference (Table III). As these findings deviate significantly from chance as predicted by existing heat theory ($p < 0.001$, by chi-square test), they clearly favour the prediction made by the orgonomic hypotheses.

Moreover, Table III showed not only the direction of the change in Td when the window was closed after being open but also how its components, T1 and T2, varied simultaneously under these conditions. This was necessary because the degree and direction of the changes in T1 and T2 determined how Td changed. For example, conventional heat theory claims that the metallic funnel is more reactive to heat than the plastic one (cf. Experiment 1). That is, when T1 and T2 increase, T1 should increase more rapidly than T2 and therefore, Td should also increase. Conversely, when T1 and T2 decrease, T1 should decrease more rapidly than T2 and therefore, Td should decrease.

The experimental findings showed that of the 159 readings taken, both T1 and T2 rose 112 times when the window was closed, both declined 36 times on these occasions and on the remaining 11 occasions, T1 and T2 responded differently from each other on closing the window (Table III). Although, conventional heat theory predicted that Td should have *increased* every time T1 and T2 rose, the results showed that that Td actually *decreased* 99 times, while increasing only 6 of the 112 times and showing no change the remaining 7 times (Table III). That is, because Td decreased on 99 out of the 112 times while both T1 and T2 increased, T1 must have increased less than T2 when the window was closed. That is, T1 was less reactive than T2 and this was contrary to accepted ideas of heat transfer.

Of the 36 times that both T1 and T2 declined when the window was closed, it would have been expected from accepted ideas on the reaction of metal and plastic to heat that Td should have decreased in every one of these trials. In fact, it did so 24 times (Table III), indicating that on these relatively few occasions that metal was more reactive than plastic. However, Td also increased 8 times (metal was less reactive than plastic) and showed no change 4 times (metal and plastic were equally reactive). These were anomalous changes (Table

Table III

The Frequency of the Decrease, Increase or No Change in Td on Closing and Opening the Window and its Distribution According to the Direction of the Changes in T1 and T2 Occuring Simultaneously (Experiment 3)

Simultaneous Changes in		Frequency of Changes in Td when			
T1	T2	$Td_{(wc)}<Td_{(wo)}$[1]	$Td_{(wc)}>Td_{(wo)}$	$Td_{(wc)}=Td_{(wo)}$	Total
Up	Up	99[2]	6	7[2]	112
Down	Down	24	8[2]	4[2]	36
Down	Up	6	0	0	6
Down	No Change	3	0	0	3
No Change	Up	2[2]	0	0	2
Total		134	14	11	159

[1]WC = window closed; WO = window open
[2]Anomalous change

III). Also, in only 2 of the remaining 11 trials, was the movement of T1 clearly less than T2 and therefore, these can also be considered anomalous (Table III). In summary, T1 and T2 acted contrary to established heat theory in 120 (99 + 8 + 7 + 4 + 2) trials and in accordance with them in 39 (24 + 6 + 6 + 3) trials (Table III). The deviation of the observed values from those expected from conventional theory in this experiment was highly significant ($p < 0.001$).

Why was the plastic funnel more reactive than the metallic funnel to changes in room temperature in Experiments 2 and 3? As it was colder outdoors than indoors in Montreal at the time the experiment was being conducted, opening the window allowed colder air to enter the room. However, to explain the anomalous changes occurring concurrently in Td it was assumed that opening the window also permitted more energy to enter the room which then accumulated to a greater extent in the metallic funnel (because being bounded by sawdust made it an orac) than in the plastic funnel which was a non-orac.

By impacting on the walls of the metallic funnel, this additional energy created more heat than did the lesser amount of energy entering the plastic funnel. As a result, the temperature decline in the metallic funnel due to opening the window was less than that simultaneously occurring in the plastic funnel.

The same reasoning could be applied to the reverse situation when the window was closed. That is, the additional energy which contributed to the extra heat in the metallic funnel when the window was opened was no longer available when the window was closed. That is, its additional contribution to heat production in the metallic funnel was not available at the very time T1 and T2 were increasing due to the window closure. Consequently, T1 increased less than T2. This explains the highly significant difference between the temperature changes observed under "window open vs. window closed" conditions in the metallic funnel (0.21 ± 0.03°C) and those observed under the same conditions in the plastic funnel (0.31 ± 0.03°C). It also explains why T1 was not more reactive than T2 in Experiment 2, again contrary to conventional expectations.

The data described in Table III showed that T1 and T2 rose 112 out of 159 times when the window was closed. This indicates that the temperature outdoors was lower than indoors and this was due to the fact that the experiment was conducted in Montreal in the spring when it is usually quite cool.

Had this experiment been conducted where the climate was considerably warmer so that the outdoor temperature was generally higher than indoors, closing the window might well have caused T1 and T2 to decline instead of increasing as observed under the conditions of our experiment. Under these conditions, both the conventional and the energetic paradigm predict that Td should simultaneously decrease, and if it did, this experiment would not be a critical test of accepted heat formulations. However, the conditions under which Experiment 3 were actually conducted yielded an increase in T1 and T2 when the window was closed and usually a simultaneous decrease in Td and this was challenging to conventional ideas of heat transfer.

The same reasoning applies to Experiment 2 which also showed rises in Td at a time when T1 and T2 fell. This was apparent from an examination of Figure 3 and from the significant negative correlation coefficients between Td on the one hand and T1 and T2 on the other (Table II). This suggests that the level of the orgone rose in the room at the same time that the room temperature fell. This may have been due to the opening of the window but might also have occurred even if the window had not been opened for a considerably long period. This is because variations in the level of the orgone outdoors would register indoors even with the window closed although it would be expected to take longer to do so.

In Experiment 2, the cold would penetrate the room in which the funnels were located whether the window was closed or open, more rapidly of course, if the window were opened. Because T1 measured the tempera ture of the air in the metallic funnel and T2 that of the plastic funnel, it was felt that T1 should decrease more than T2, that is, that T1-T2 or Td should decrease when the room temperature fell. However, the reverse was true, that is, Td generally increased, indicating that the metallic funnel was less reactive than the plastic one. To explain this, it was assumed that along with the cold air entering the room also came more orgone energy which entered the metallic funnel or Orac preferentially and which would diminish the extent to which T1 would normally be expected to decrease. There was no such buffering effect on T2, the temperature of the non-Orac.

And just as in Experiment 3, had this experiment been conducted in Montreal in the warm summer, opening the window would have allowed the indoor orgone to increase but at the same time T1 and T2 might have increased and in this instance, the increase in Td would have been expected by conventional ideas on heat transfer. In short, in both Experiments 2 and 3, the fact that both experiments were conducted at a time when the weather was cold, or at least cool, led to findings which were challenges to conventional heat theory.

Although the Td values were lower most (84%) of the 159 trials when comparisons were made between values with the window closed versus the window open, still Td was not lower every time. For the latter to have occurred, the orgone would have had to be always higher outdoors than indoors at least during the interval when the comparisons were being made. While this was probably true during most trials, there were occasions when the level of the orgone outdoors may well have dropped locally considerably, especially preceding a marked change in the weather.[8] That is, in such circumstances, Td values were being determined at the very time that the amount of the energy outdoors may have suddenly dropped locally, yielding a lesser difference between the energy outdoors and indoors, and if such were the circumstances, Td might not have increased when the window was opened, or not declined when the window was closed.

Temperature Changes in the Air of a Metallic Funnel and of a Plastic Funnel Sitting on a Copper Plate Maintained at 50°C for 22 Months (Experiment 4)

This experiment was an extension of Experiment 2 in that it was conducted for 22 months instead of 39 days. Also, the room in which Experiment 4 was carried out was airconditioned and lit from 8 a.m. to 8 p.m. and was about the same size as the one in which the previous experiments were conducted.

The present room also had an office window facing the southwest and a door on the northeast which opened into a corridor. The window was kept closed throughout the experiment and it was covered with a black screen which prevented direct sunlight from entering the room and failing on the box containing the 2 funnels. The door was always kept closed except when entering or leaving the room.

The apparatus used in Experiment 4, was the same as in the previous experiments (Figure 1) except that a piece of galvanized iron completely covered the bottom of the metallic funnel, separating it from direct contact with the bottom of the cardboard box on which it sat. A piece of plastic was similarly positioned to cover the bottom of the plastic funnel. Thermometers, accurate to 0.1°C, were placed in the same position through the stems and just below the point at which they joined the funnels as in the previous experiments. The heating plate was initially set at 47°C.

The temperature of the room (T3) in which the funnels were located was determined by a thermometer suspended in the room outside the funnels. The outdoor temperatures (T4) were obtained from monthly abstracts of meteorological observations taken at an observatory located about a kilometre from where this experiment was being conducted.

The data presented in this paper are based on 1422 readings of T1, T2, Td, Tpl and T3 taken between November 1968 and August 1970. Sixty-five readings of each of these parameters were taken per month on the average, the maximum being 119 taken during November 1968 and the minimum being 25 taken during November 1969. The readings for each month were averaged and presented in Figure 4. The results were as follows:

1. T1 was at a minimum of 37.30° C during December 1968, then rose to a maximum of 39.84°C during July 1969 following which it fell again to a minimum of 37.50°C during January 1970 after which it again rose to a maximum of 39.57°C during August 1970 (Figure 4). The mean ± standard error of T1 for the 22 months was 38.54 ± 0.17°C.

2. T2 was at a minimum of 32.68°C during December 1968, then rose to a maximum of 35.47°C during July 1969 following which it fell again to a minimum of 32.65°C during January 1970 after which it again rose to a maximum of 35.15°C during August 1970 (Figure 4). The mean ± standard error of T2 for the 22 months was 33.99 ± 0.19°C.

3. Td was at a maximum of 4.65°C during November 1968, then fell to its lowest values between April 1969 (4.29°C) and August 1969 (4.30°C), then rose to a maximum again of 4.79°C during January 1970 after which it fell again to a minimum of 4.36°C during August 1970 (Figure 4). The mean ± standard error of Td for the 22 months was 4.50 ± 0.03°C. The significantly higher values for T1 than T2 persisted for 22 months in Experiment 4, much longer than the 39 or 36 weeks in Experiments 2 and 3 respectively, and so whatever explanations were offered earlier for the persistence of Td in Experiments 2 and 3, apply at least equally well in Experiment 4.

4. Tpl was at a minimum of 46.1°C during November 1968, then rose to a maximum of 47.8°C during July 1969 following which it fell again to a minimum of 46.7°C during January 1970 after which it again rose to a maximum of 47.7°C during August 1970 (Figure 4). The mean ± standard error of Tpl for the 22 months was 47.2 ± 0.1°C. These variations in Tpl were not due to any manipulation of the temperature-setting dial on the copper plate, but due to the spontaneous variations in room temperature. Apparently, Tpl followed the seasonal changes in room temperature while being maintained thermostatically at about 47°C.

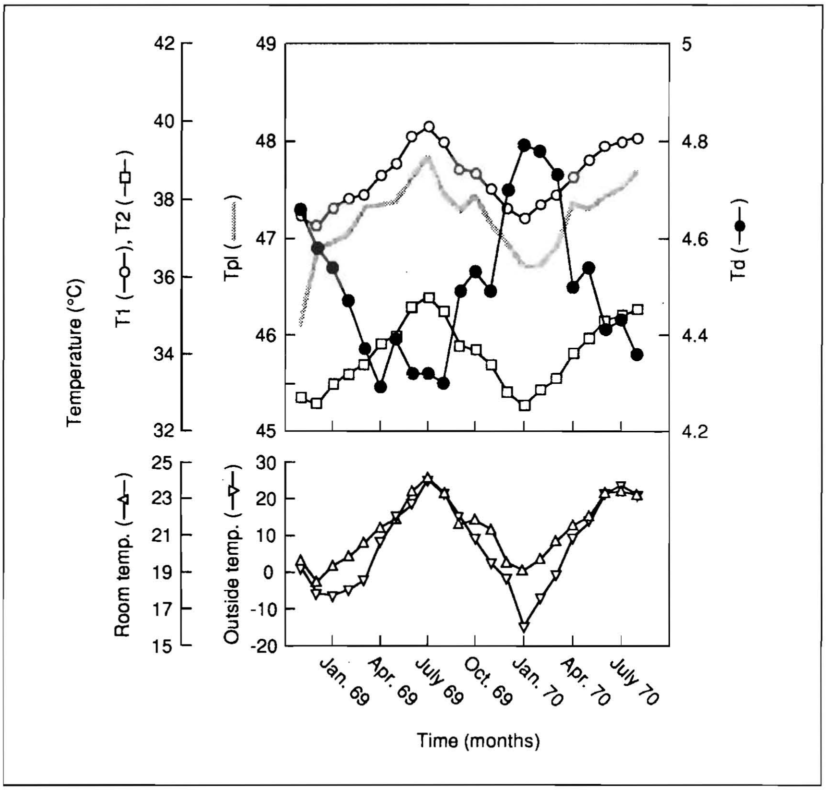

Figure 4. *The variation of the temperature of the air in the metallic funnel (T1), the air in the plastic funnel (T2) and the temperature difference between them (Td) when the box containing the 2 funnels sat for 22 months continuously on a heating plate set to heat to 47°C (Tpl). Room temperature and outside temperature are also included in the figure.*

5. The room temperature (T3) was at a minimum of 18.5°C during December 1968, then rose to a maximum of 24.3°C during July 1969 following which it fell again to a minimum of 19.1°C during.January 1970 after which it again rose to a maximum of 23.4°C during July 1970 (Figure 4). The mean ± standard error of T3 for the 22 months was 21.3 ± 0.4°C.

6. The outside temperature (T4) was at a minimum of -6.7°C during January 1969, then rose to a maximum of 24.8°C during July 1969 following which

it again fell to a minimum of -15.2°C during January 1970, after which it again rose to a maximum of 23.2°C during July 1970 (Figure 4). The mean ± standard error of the outside temperature for the 22 months was 12.3 ± 2.5°C.

T1, T2, T3, T4 and Tpl all showed the lowest values during each of the two winters and the highest values during both summers (Figure 4). Moreover, all possible correlation coefficients between them were positive and highly significant (Table IV, $p < 0.001$, $n = 20$). On the other hand, the correlation coefficients between Td on the one hand and T1, T2, T3, T4 and Tpl on the other were all negative and also highly significant (Table IV, $p < 0.001$, $n = 20$).

Obviously, the prime mover in the temperature changes observed in T1, T2, T3 and Tpl was the outside temperature before T4) which influenced the changes in room temperature (T3) which in turn influenced T1, T2 and Tpl.

From observations in Experiment 1, an increase in Tpl should have resulted in an increase in Td and a decline in Tpl should have resulted in a decline in Td. Instead, in Experiment 4, despite the fall in Tpl, which occurred because of changes in seasonal temperature, Td increased and when Tpl rose again in accordance with seasonal temperature changes, Td decreased. That is, Tpl and Td moved in opposite directions during the changes in temperature brought on by seasonal changes. That is, in Experiment 4, Td was not primarily influenced by Tpl as it was in Experiment 1 but was influenced by another factor.

Why, in Experiment 4, did Td yield the highest values when T1 and T2 were at their lowest and vice versa? For Reich, Td was an indicator of the orgone energy level in the atmosphere.[5] If so, it would appear from Figure 4 that Td was at its highest in the winter, when ambient temperatures were at their lowest, and that Td was at its lowest in the summer, when these other temperatures were at their highest. The trend towards lower ambient temperatures occurs when the earth inclines away from the sun and the trend towards higher temperatures occurs when to the earth inclines towards the sun. However, despite the inclination of the earth away from the sun in the winter, it is actually closer to the sun in the winter in the northern hemisphere than in the summer. This is because of the eccentricity of the earth's orbit around the sun which is

Table IV
The Correlation Coefficients Between T1, T2, Td, Tpl, Room Temperature (T3) and the Outdoor Temperature (T4) in Experiment 4

	T1	T2	Tpl	T3	T4
T2	0.994				
Tpl	0.869	0.888			
T3	0.989	0.981	0.840		
T4	0.954	0.951	0.778	0.956	
Td	-0.751	-0.819	-0.790	-0.727	

Table IV. T1, T2, Td and Tpl are defined in the heading of Table I and in the text of the paper. The correlation coefficients between T1, T2 Td Tpl, T3 and T4 are all highly significant (p < 0.001).

positioned at one focus with the result that the earth is 3 million miles nearer the sun at perihelion (January 3 or 4) than at aphelion (July 3 or 4).

Moreover, the correlation coefficient between the distance of the earth from the sun over the 22 month experimental period on the one hand, and T1, T2 and Td on the other were significantly positive ($p < 0.001$) for both T1 ($r = 0.955$) and T2 ($r = 0.952$) and also highly significant but negative for Td ($r = - 0.721$, $p < 0.001$). That is, T1, T2, Tpl, T3 and T4 decreased to a minimum during winter in the northern hemisphere because the earth was tilted away from the sun at this time. At the same time, Td increased to a maximum because this was when the earth was in that part of its orbit which was closest to the sun. The converse was also true, that is, T1, T2, Tpl, T3 and T4 increased to a maximum during summer in the northern hemisphere because this was the time of the year when the earth was tilted towards the sun. At the same time, Td decreased to a minimum because at this time it was at its farthest from the sun. To explore this question further, it might prove informative to conduct Td studies aboard a space ship that traveled in its orbit closer to, and farther from, the sun than does the earth in its orbit around the sun.

According to Reich, the sun emits an electromagnetic radiation which then "excites the earth's orgone envelope where it is dense enough for lumination."[9] That is, light is a local excitation of the orgone by electromagnetic rays from the sun. Therefore, Td may be higher the nearer the funnels are to the sun because the sun radiates electromagnetic rays which excite the orgone. Reich felt that the orgone itself was "basically different from electromagnetic energy" and yet has a relationship to it.[10]

If the magnitude of Td was at least partially influenced by its distance from the sun, then had Experiment 4 been conducted in the southern hemisphere instead of the northern one, the highest values for Td would still have been recorded during December or January because the earth was closest to the sun at that time and the lowest values would still have been recorded in July or August because the earth was farthest from the sun at that time. However, the highest seasonal temperatures prevail during December and January in the southern hemisphere, whereas the lowest seasonal temperatures prevail there during July and August. That is, the incremental effect due to the earth being nearest the sun in January would have been added to T1 while seasonal temperatures were at their highest in the southern hemisphere. Conversely, those amounts of orgone energy that should be absent due to being farthest from the sun in July would have been removed from T1 while seasonal temperatures were at their lowest. Therefore, in conducting Experiment 4 in the southern hemisphere, T1 would appear to be more reactive to ambient temperature changes than T2. That is, the anomalous behaviour of T1 relative to T2 observed when Experiment 4 was conducted in the northern hemisphere would not be observed had the experiment been conducted in the southern hemisphere because T1 and T2 would have behaved in accordance with conventional experience.

The effect of the outdoor climate on the findings of Experiments 2 and 3 has already been discussed earlier and this applies equally whether conducted in the northern or southern hemisphere. If it is hoped to observe data which challenge conventional experience, then the experiment should be conducted during the cold months whether the experiment is conducted in the northern or southern hemisphere. An essential difference between the aims of Experiments 2 and 3 on the one hand and Experiment 4 on the other was that in the former, the local variations in the orgone were being investigated in Experiments 2 and 3 while the influence of the sun was being probed in Experiment 4.

What are the sources of the energy accumulated by the metallic funnel surrounded by sawdust? Experiments 2 and 3 indicated that there was an energy immediately surrounding the funnels, while Experiment 3 showed that there was usually more of it outdoors than indoors. Experiment 4 suggested that the sun also made a significant contribution since the distance of the funnels from the sun influenced the Td readings. It is assumed that the earth's atmospheric orgone energy is more excited by the sun when the earth was nearer the sun than when it was farther from the sun. This secondarily caused T1 to react to a greater extent than T2 when the earth was nearer to the sun than when it was farther from the sun.

Finally, Experiments 2, 3 and 4 revealed that the variation of T1 relative to T2 was anomalous. Conventional heat theory predicted that T1 should be more reactive than T2; in actual fact, the reverse was shown to be true under the equilibrium conditions of Experiments 2, 3 and 4. Conventional heat theory fails to explain the observed data because it neglects to take into consideration the existence of a widely pervasive energy in the atmosphere.

In conclusion, in attempting to interpret the results of the 4 experiments, both the conventional and energetic paradigms could explain the findings of Experiment 1, but only the energetic one could explain the results of the last three experiments. That is, Reich's claim that there existed an energy, the orgone, in the atmosphere was essential for a clear understanding of the findings of this study. Further studies are indicated.

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REFERENCES & NOTES

1. Bernard Grad, Some Biological Effects of the "Laying on of Hands:" A Review of Experiments in Animals and Plants *Journal of the American Society for Psychical Research* 59 (1965), pp. 95-127.

2. Bernard Grad, "The Laying on of Hands:" Implications for Psychiatry, Gentling and the Placebo Effect *Journal of the American Society for Psychical Research* 61 (1967), pp 285-305.
3. Wilheim Reich, *The Discovery of the Orgone, Volume 1, The Function of the Orgasm* (Orgone Institute Press, New York, NY, 1948).
4. Wilheim Reich, *The Discovery of the Orgone, Volume 2, The Cancer Biopathy* (Orgone Institute Press, New York, NY 1948).
5. Wilheim Reich, *The Discovery of the Orgone, Volume 2, The Cancer Biopathy* (Orgone Institute Press, New York, NY 1948), pp. 104-105.
6. R. A. Harman, Further Experiments with Negative To Minus T, *Journal of Orgonomy* **20**,1 (1986), pp. 67-74.
7. Wilheim Reich, Orgone Energy and "Ether," *Orgone Energy Bulletin* **1**,4 (1959), pp. 143-157.
8. Wilheim Reich, *The Discovery of the Orgone, Volume 2, The Cancer Biopathy* (Orgone Institute Press, New York, 194), pp. 118-119.
9. Wilheim Reich, Orgonotic Light Functions 1, Searchlight Phenomena in the Orgone Envelope of the Earth (1942-1944), *Orgone Energy Bulletin* **1**,1 (1949), pp. 3-6.
10. Wilheim Reich, *The Discovery of the Orgone, Volume 2, The Cancer Biopathy* (Orgone Institute Press, New York, NY 1948), pp. 4-10.

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