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The Detail Of Paranormal Metal-Bending

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Based on a paper delivered at the Second International Conference of the Society for Psychical Research at Cambridge, March 1977. Reprinted by permission from the Journal of the Society for Psychical Research, March 1979.

The detection of dynamic strain signals in paranormal metal-bending 'action' (1) has enabled experimentation to be carried out on the distribution of the action around the metal-bender. A resistive strain gauge is mounted on or in a small metal specimen, which hangs from its screened electrical connections; electrical bridge, amplifier and chart recorder enable dynamic strain data to be collected. It is found that the 'action' occurs in [illegible]ts of extension or contraction, rather randomly distributed in time, often at a rate of about fifty per hour.

An early result of experiments with several independent embedded resistive strain gauges was the finding (2) that dynamic strain pulses were frequently registered simultaneously on two entirely separate metal specimens. The data were interpreted in terms of a crude physical model of a 'surface of action', at points on which strain pulses occur. The configuration and movement of this surface with respect to the metal-bending subject can then be studied.

A further series of studies (3) were conducted with several independent strain gauges on a single piece of metal. The linear array of gauges along a thin strip of metal respond simultaneously to the 'action', but the signals are strongest in the centre of a 'region of action', which extends about ten inches, and can move slightly from event to event. A series of experiments was also conducted with strain gauges on apposite sides of the metal strip. For a 'pure bend' the signals should be in opposite directions, but these conditions were only obtained in the limit of infinitely thin metal strip; for strips of thickness in the region of 1 cm, one strain gauge receives a much smaller signal than the other, as though the penetration was incomplete.

Since there is no very strong reason for expecting the signals to be of magnitude or sense uniformly distributed across the thickness of the metal, it appears important to investigate the profile of strains in thick metal specimens. We therefore mounted six sensors throughout the thickness of a metal speciman, and co[illegible]ected them to six separate battery-operated bridges and am[illegible]iers, using two synchronized three-pen chart recorders. Two different methods of fabricating the sensor were used: in one the strain gauges were mounted inside slots milled in the metal; in the other the strain gauges were stuck to metal strips, which were interleaved with spacers stuck together with epoxy resin; both methods are detailed in Figure 1. INCL 4

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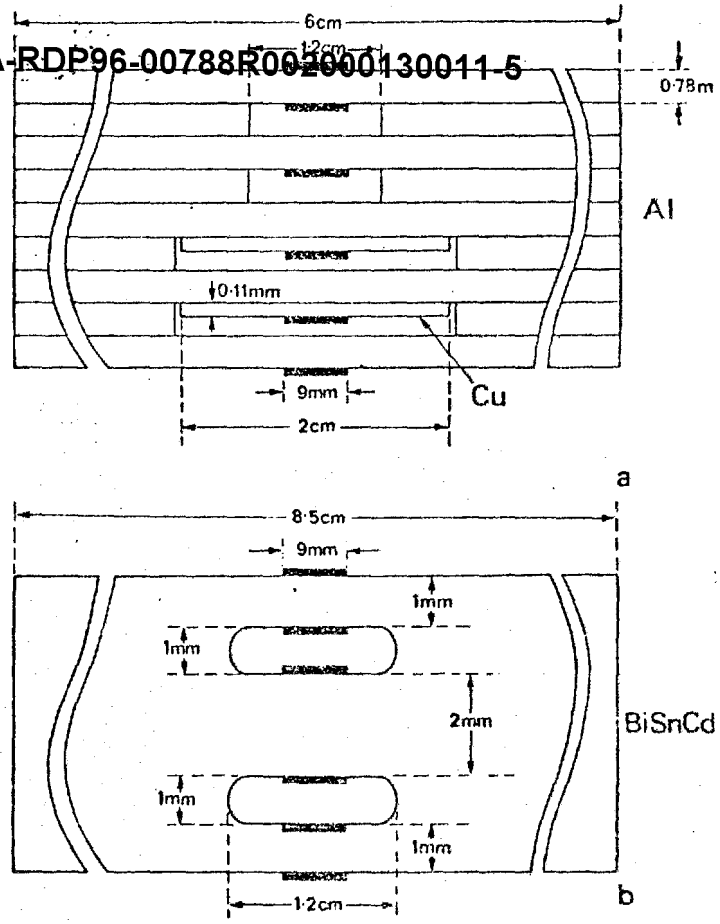

1. Cross-sections of metal specimens a) Laminar, and b) Solid eutectic alloy, containing six strain gauges for investigation of dynamic strain profile.

EXPERIMENT WITH STEPHEN N.

Three experimental sessions were held with thirteen-year-old Stephen N., and simultaneous strain signals were recorded at six strain gauges. The thick metal strip was suspended horizontally radially in front of the subject.

The subject was seated and was able to reach forward his hand within a few inches of the end closest to him, but part of the time he did not hold out either hand, and many signals were observed during these periods. One author would superintend the working of the equipment, leaving the other free to witness the action without touch produced by the subject. Members of the subject's family were often present. The normal time for an experimental session was sixty to ninety minutes.

When a metal strip is bent, either elastically or plastically, the convex face experiences extension (positive strain), whilst the concave face experiences contraction (negative strain). At the curved neutral surface, in the centre of the strip, there is no change of strain. If a positive strain were represented by an arrow of length proportional to its value pointing to the right and a negative strain by an arrow pointing to the left, then the normal bending situation could be represented by a series of arrows, as shown at the left-hand side of Figure 2.

If an array of synchronous paranormal bending signals represents a pure bend with the top face convex, then they could be shown graphically as a set of data points extending diagonally from bottom left to top right. A pure extension would be represented [illegible] vertically one above the other.

The arrays of signals recorded in experimental sessions are

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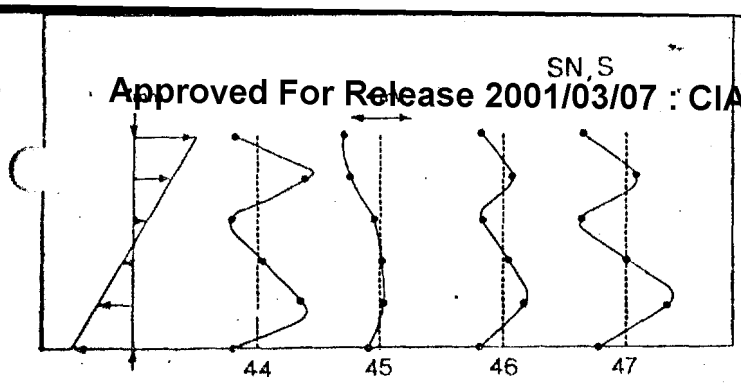

2. Typical profile of dynamic strain signals across the thickness of a metal specimen. Also shown at the left is the profile that would result from a pure bend. Signals correspond to quasi-forces of about 20 gm weight.

more complicated than the above. A selection of typical arrays, actually a series from session S, are shown in Figure 2.

A simple classification of arrays may be made on the basis of the number of changes of direction in the line joining the data points. Arrays with no changes are bends; those with one change are symbolized by the letter V, those with two changes by N, those with three by W and those with four by M.

In table 1 the numbers of signals arrays of each type are listed. The action inside the metal is more complicated than might have been supposed. The phenomenon might more appropriately be described as paranormal 'metal-churning' than 'metal-bending'. A strain is localized to a depth of less than about a millimetre, and may often be accompanied by a strain in the opposite sense at a neighbouring strain gauge.

It is of course important to verify by other experiments that the signals do not arise from paranormal action on the electronic equipment or even on the pen of the chart recorder. Two subsidiary experimental programmes were mounted for this purpose. In the first a galvanometer mirror was mounted on a very thin spring steel strip, with strain gauge attached. One end of the spring was attached to a horizontal surface under a glass dome, and an optical beam from a helium-neon laser passed through the dome and was reflected through it again from the mirror and onto a scale. The optical path was about 5 m. Small movements of the light spot were seen to synchronize with strain gauge signals, and some ringing was observed, due to the long-period mechanical resonance of the system.

NO SIGNALS IN DUMMY GAUGE

In the second experiment a dummy strain gauge was included with real strain gauges on a metal strip. Typical signals were observed on the real strain gauge chart record throughout the

TABLE 1. Numbers of signals sextets of different profile complexity in Stephen North sessions.

Profile Type	Session	Q	S	T	Number of Gradient Changes
	Specimen type	a	b	b	
and or stretch		5	11	1	0
V		19	10	2	1
N		11	11	8	2
W		4	18	11	3
M					4

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session, but no signals at all were recorded from the dur gauge. A resistive thermal sensor (Micro-Measurements type 50D) of 70 resistance was connected with series compensatio one channel of the electronics. In physical appearance the ther sensor is very similar to the resistive strain gauge (Micro-Meas ments type EAOG 125 BT 120) but its resistance is insensitiv strain although highly sensitive to temperature. Sudden temp ture changes are unknown to us in paranormal metal-bend sessions, although temperature drifts usually occur, arising f environmental causes. Paranormal strain signals, on the o hand, are sudden, in that they are sharpfronted pulses.

Although these experiments have vindicated the inter tation that the paranormal action is an internal strain in the m or strain gauge or both, it must be stressed that dummy ga techniques have not been used as standard practice in all the periments reported here. It is our custom to introduce a dun gauge at irregular intervals, averaging one session in ten.

We now describe the use of the strain gauge as a dete of directional effects in paranormal metal-bending. The exp ments on the distribution of signals along the length of a metal

Dr. John Hasted with Willi G.

(3) had been conducted using strips of width 8 mm, only jus ficient to mount the strain gauges. The assumption was ma analysing the data that the extensions and contractions directed entirely along the long axis of the specimen (typical cm x 7.5 mm x 0.75 mm). It was decided to test whethe directed assumption would be valid on wider metal strips.

We therefore experimented with a strip just sufficiently for a strain gauge to be mounted across its width; the dimen were 13.5 cm x 18 mm x 0.75 mm. Signals were in fact rec from action on this strain gauge, but they were much smalle those recorded on the strain gauge mounted along the major When a wider strip was used, larger signals were recorded. I therefore decided to experiment systematically on the direc of the dynamic strain vectors in sheet-metal specimens.

On long thin specimens, with high axial ratio, there cou a psychological factor which favours the production of vectors directed along the major axis. This factor, whose exis has not been proven, might be investigated on a subse occasion; but in the first experiments, the safest course wou to investigate a round or square disc specimen in which the psychological factor would be absent. The orientation of the disc w spect to the subject and to the horizontal.

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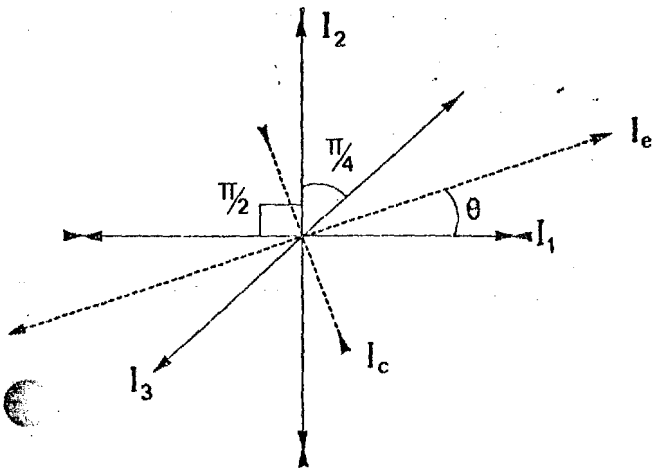
AN IMPORTANT PHYSICAL FACTOR

There is also an important physical factor which affects the strain. When tension (positive stress) is applied along a diameter of a circular disc, an extension (positive strain) will be recorded along that diameter, but an equal contraction (negative strain) will be recorded along the orthogonal diameter. A more complicated stress produces strains of different magnitudes along orthogonal diameters. The strain tensor has many components, but it is possible with three strain gauges to determine two orthogonal components.

Figure 3 shows the arrangement of the sensors and defines the angles and magnitudes of the strains. A solution of the problem of determining the magnitudes and angles θ and $\theta + 90$ of the extension and contraction vestors I_e and I_c from the vectors I_1, I_2 and I_3 recorded at the 'rosette' of strain gauges has been given by Mr. Jankowski. The equations appear with Figure 3.



$$I_e = \frac{\alpha + \beta}{2}, \quad I_c = \frac{\alpha - \beta}{2}$$

$$\alpha = I_1 + I_2, \quad \beta = \frac{I_1 + I_2}{\cos^2\theta}$$

$$\theta = \frac{1}{2}\arctan \frac{(2I_3 - I_1 - I_2)}{I_1 + I_2}$$

3. Directions of strain gauges 1,2,3, mounted in rosette. Equations connect the measured signals I_1, I_2, I_3, with the extension I_e and orthogonal contraction I_c.

Two different configurations of the disc with respect to the subject have been used. In the first the disc is hung vertically and radially in front of the subject. In the second the disc and electrical connections are strapped upon the bare forearm of the subject, who is presented with another target for his 'action'. He normally extends his arm to hold his hand about six inches from the target, and the disc rests slightly above the hairs on the forearm. Each triplet of dynamic strain pulses represents a positive or negative strain in a direction θ and a corresponding strain at $\theta + 90°$. These may be represented on a diagram by two radial lines of lengths corresponding to the strain magnitude. The signals during a session then appear as a Figure 4, which we call a 'star diagram'. We can see by inspecting such a diagram just what was the directional character of the signals in the session.

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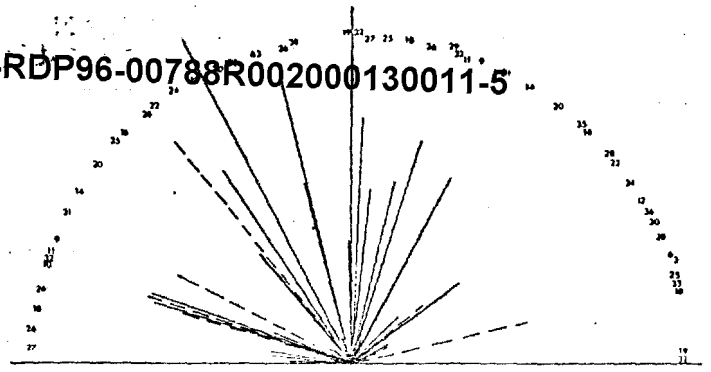

4. 'Star diagram' for Stephen North session N. Solid lines represent extensions, broken lines contractions. Lengths represent magnitudes, numbers indicate the session numbers of the two corresponding orthogonal signals. Calibrations show that the largest signals correspond to a quasi-force of about 100 gm weight.

NO PREFERRED DIRECTION

In the sessions with Stephen N. there were no very strong preferences of direction. In particular we note session U, in which a square metal specimen was suspended vertically from one corner. As appears from the histogram of Figure 5, there is no particular preferred direction, neither horizontal, vertical, nor parallel to either side of the square.

Similarly, there is no particularly preferred relationship between the magnitudes of the corresponding extension and orthogonal contraction signals; for a circular disc suffering a single radial stress vector we would expect the corresponding signals to be approximately equal. The histogram of ratios, shown in Figure 5a, demonstrates the absence of preferred ratio. Indeed there are a certain number of pairs of corresponding signals which are of the same sign, that is, both extensions or both contractions. These are not included in Figure 5a. Such signals arise from a stress more complicated than a single radial vector, and consist of at least a pair of orthogonal vectors (i.e. simultaneous pulling or pushing by two pairs of hands). The proportions of such signals are to be found in Table 2.

It would appear from both types of experiment that there is turbulence in the strain, localized to distances of the order of a millimetre or less. Perhaps on some occasions there is action on the strain gauges alone, hardly penetrating into the metal. As has already been noted, the phenomenon might be termed 'metal-churning' rather than 'metal-bending'; and it is possible that the churning takes place on a much smaller scale than we can resolve with arrays of strain gauges. It requires metallurgical investigation of the structure to settle the question; but early investigations (4) disclosed no significant differences between paranormally and mechanically bent metal specimens.

STRUCTUAL EFFECTS SUBSTANTIATED

The first well-substantiated claim that paranormal action can produce structural change was made by Crussard and Bouvaist (5) who investigated the adult French metal-bender Jean-Pierre Girard. Probably the most significant report they published was that physical change could be induced in aluminium alloy AU4SG-T351 and AU4G-T351, "without actual bending occurring. However there was some permanent deformation of the metal, in that the strip became thinner by several microns. The 'action' was detected by measurements at many points of the microhardness of the metal; an easily detectable enhancement

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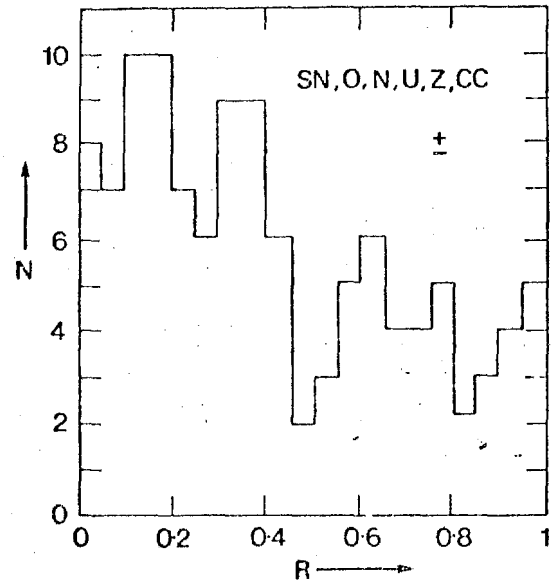
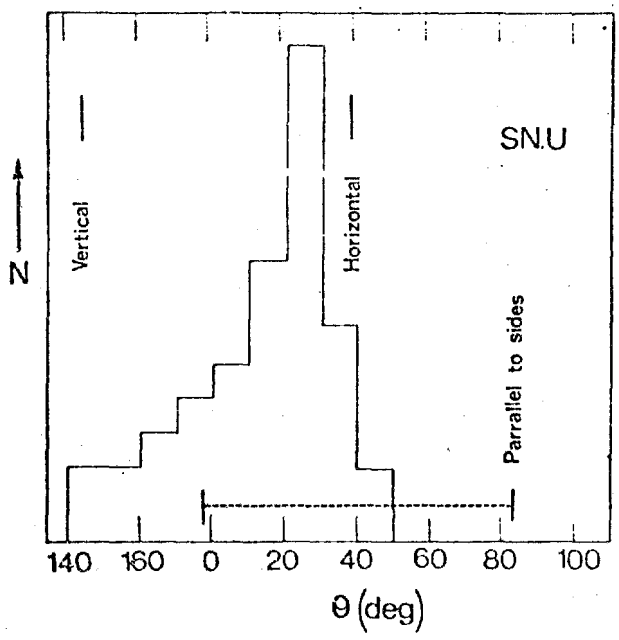
reaching as much as 10% over about 30 mm was observed on each of the two sides. Examination by scanning electron-microscope of the foils from the hardness-enhanced section revealed a high density of loop and other dislocations.





5. a) Histogram of ratios of corresponding extension to contraction signals obtained during Stephen North sessions. b) Histogram of directions of signals (Irrespective of their magnitude) obtained in session SNU.

TABLE 2. Statistics of Directional Vectors.

Session	Shape of specimen	Remarks	Number of extensions accompanied by contraction	Number of extensions accompanied by extension	Number of contractions accompanied by contraction
SN N	Square side 5 cm		13	4	0
SN O	" "		18	5	8
SN U	" "	Two permanent deformations	37	4	3
CC 2	" "		2	3	0
[illegible]	3.7 cm diam.	Arm mounting	[illegible]	[illegible]	[illegible]
SN CC	" "	Arm mounting. 1 sensor fractured	11	6	0

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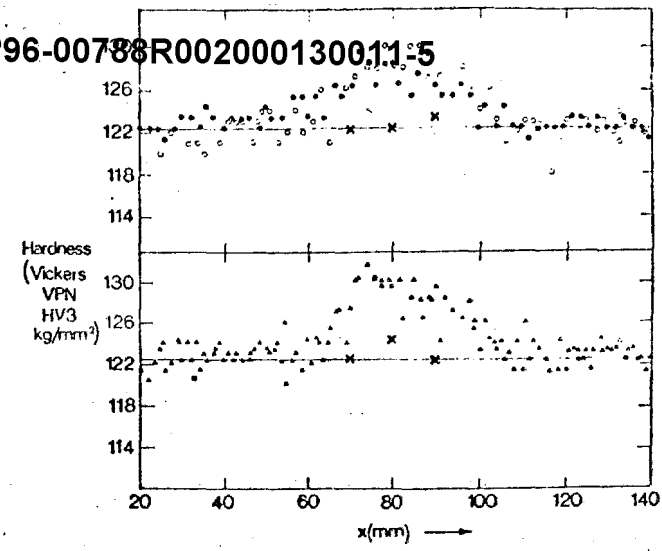

6. Paranormal hardness variation at centre of either side of aluminium alloy Open data points taken by Dr. Desvaux (Leatherhead), closed data points Bouvaist (Voreppe). Solid lines represent mean of pre-exposure data (t points shown as crosses).

This claim is of such significance that it has been a m of great importance that it be confirmed or disproven. therefore invited metal-bender Jean-Pierre Girard to London under witnessing exposed a similarly prepared specime AU4G-T351 to his action. A small decrease (3 μm) in thickness of the specimen was monitored during exposure. A wards the microhardness of both sides of the specimen independently measured by Dr. Desvaux at the Electrical search Accociation and by Dr. Bouvaist at the Pechiney lab tories. The comparison between their data is seen to be satisfac in Figure 6, and a local hardness enhancement is clearly s Similar experiments with metal-bending children are in prog

When a metal is bent, physically or paranormally, the w hardening at the bend is associated with new dislocations. T are not usually loop dislocations, which can be produce exposure to nuclear radiation. Metals in which dislocations induced do not always bend, but internal strains are set up, a these are of appropriate magnitude and configuration, pl deformation can occur.

We could make a reasonable supposition that a 'prin event in the paranormal metal-bending process is the formati loop and other dislocations. These need not necessarily resu actual plastic deformation. In this way both hardness enha ment and bending could be classed as the same type of e differing only in geometrical configuration of the action.

PERMANENT DEFORMATION OCCURS

We have seen that the elastic dynamic strain signals continually in their geometrical configuration (1,2,3). It is that these represent the dynamic strains caused by the produ of the dislocations; when there is a sufficient gradient of res strain, the yield point is reached, and permanent deform occurs.

Thus the paranormal metal-bending action, albeit lin macroscopically to a 'surface of action'(2), which is still a u model in current experiments, is essentially an int action. Which we could claim that it was "information w brought about dislocations in the lattice; this 'information' well be connected with the role of the observer in qua

mechanics (7) and might be termed 'mentally induced tunnel effect'. O[illegible] quasi-force field acting on the metal.

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The detailed structure of the surface of action is a kind of '[illegible]ain of rainfall', enveloping certain lattice points and causing the onset of loop dislocations. However, these produce hardening and not softening of the metal, and we recall that there is good evidence, both in early observations and in unpublished observations of Crussard and Bouvaist, of temporary and permanent softening, sometimes so extremee that it has been referred to as 'plasticization' of the metal before fracture.

If we hypothesise that the surface of action is sometimes capable of specific action at grain boundaries (taking on a kind of irregular honeycomb configuration), then a softening mechanism similar to the well-known quasi-viscous creep becomes possible. In this high temperature process extremely thin layers of atoms at the grain boundaries actually liquefy; but in the paranormal plasticization the temperature rise is unobservable, thus implying extreme specificity of the action, which would have to ensure that only a minute proportion of the atoms ever reached the high temperature phase. Electron micrographic evidence for the liquefaction has been obtained by Crussard and Bouvaist in the paranormal permanent softening process.

The direction of work in progress is to test the hypotheses that the dynamic strain signals correspond in number and strength to the density of dislocations produced in the lattice, and to the degree of liquefaction at the grain boundaries.

We are grateful to the New Horizons Research Foundation, and to the Society for Psychic Research for financial support of these studies.

J[illegible]N B. HASTED, Ph. D. Professor of Experimental Physics; Head, Department of Physics, Birkbeck College, University of London, London, England. Pioneered research in opening up the microwave region of the electromagnetic spectrum in communications; specialized training in chemistry, Author of books on atomic collisions, and on dielectrics, and many professional papers, including MY GELLER NOTEBOOKS (to be published). □

*Aluminum with small proportions of copper and magnesium, heat treated in a specified manner, for use in supersonic aircraft

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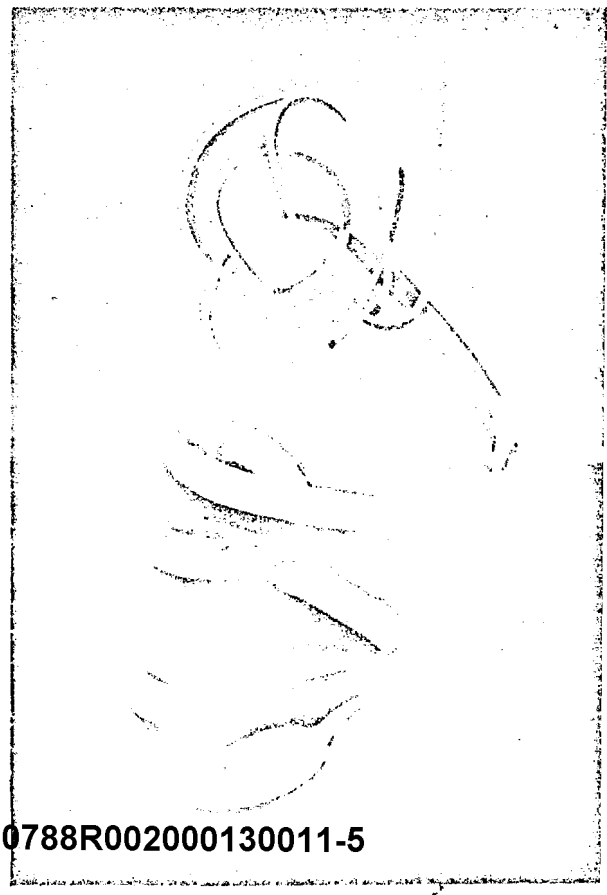

One of Peter's Sculptures

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The Metal-Bending Controversy

in Literature and Lab

by SAT BIR SINGH KHALSA

I. INTRODUCTION
II. THE DATA ON PKMB
- **i) Uri Geller**
  - a) Anecdotal Observations
  - b) Controlled Observations
- **ii) Other Individuals Manifesting PKMB**
  - a) Anecdotal Observations
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III. THE DISCUSSION OF THE DATA ON PKMB
- **i) The Criticisms**
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IV. THE DEEPER ISSUES
- **i) PKMB In Perspective**
- **ii) Directions For The Future**

I. INTRODUCTION

Since a large segment of the published literature on psychokinetic metal-bending (PKMB) concerns itself with Uri Geller, the first to "demonstrate" it, it is convenient to consider his material separately in section II - The Data on PKMB. The majority of the PKMB data has been reported in non-technical journals and is of an anecdotal nature; the attempts at controlled observations are therefore considered separately. Discussion of the data involves issues which, for the most part, are common to both Geller and the other individuals manifesting PKMB and are considered as a whole, with presentation of the pro and con approaches respectively. The final section will examine the overall approach to the PKMB phenomenon, the controversy generated, and some of the conclusions arrived at.

The goal of this review is to acquaint the reader with the literature and so consists largely of extracts taken directly from it; it is hoped that this will allow the reader to come away with more of a first-hand experience of the issue.

II. THE DATA ON PKMB

i) URI GELLER

a) Anecdotal Material

PKMB first came to attention via Uri Geller whose stage performances of his ability in Israel began his rise to worldwide recognition. Geller is reported to exhibit other psychokinetic powers including clairvoyance and precognition, but it was the novelty of PKMB which drew attention. In a 1973 interview he tells us:

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Actually, the first observable thing that ever happe
me wasn't cracking or bending an object, it was movi
[illegible] happened by coincide
school, when I was about seven years old.

In class I noticed that my watch would show a d
hour than what it really was, which began to happen
frequently. I complained to my mother about the wris
being broken; she examined it and said that it kept goc
for her. But it continued to happen, so one day in class I
off and held it in my hands, watching it very closely. I be
notice that the hands would change their positions
instantaneously - very fast - like dematerializing from or
to another. When I tried the same thing alone, outside of
wouldn't happen; so I realized I had to be in class - a
people - for it to happen.

Not long after that, the wristband bent and broke. Th
actually the first time I became aware of something b
and breaking near me. (1)

And then from his autobiography, MY STORY:

I soon began to notice other things besides the ha
watches moving and bending, which made me feel more
freak. One time my mother had made some mushroom
There was good white bread with the soup, and I dipp
bread into it and ate. Then I started eating the soup w
spoon. I'm left-handed, so I held the spoon in my left ha
took several sips of the soup. My mother was standing
kitchen stove. I was lifting a full spoonful up to my mouth
suddenly the bowl of the spoon bent down and spilled he
into my lap. Then the bowl of the spoon itself fell off. I w
there holding on to the handle. (2)

*Geller has had a passion to perform his talents and his pe
ances soon drew attention of the local media, of which h*

As far as my performances in Israel are concerned, I
hundred shows and got nearly all positive reaction fro
press, although I was never checked in the laboratorie
scientists. Israel is a small place and by that time
everyone had seen me. But then a very negative article
out accusing me of using laser beams to bend and break
that I had pliers, mirrors, and springs hidden on m

*However, the material on Geller from his time in Is
fragmentary at best, and it was not until parapsych
Andrija Puharich met Geller and brought him to the
States that the published literature on Geller became
inous.*

*Now a celebrity, he demonstrated off stage for scienti
journalists which effort has resulted in a large number o
dotal reports.*

*The classical anecdote of PKMB is one wherein Gelle
strokes a key or spoon and it then is observed to benc
occasion to fracture. More convincing are those instances
PKMB was reported without physical contact, and exam
this will be presented. Alan Vaughan writes of his exp
with Geller and the editor of "PSYCHIC" magazine:*

Taking a hotel room key, Bolen first attempted to be
manual means. He succeeded only in raising a blood
He handed it to Geller who, holding it by the handle, ha
to me. I grasped the key by the large end and put my oth
on top. Geller put his hand lightly on top of mine. He ask
my hands felt any sensation, but they did not. Then he as
to look at it. It was bent about 30 degrees and was still
bending as I watched. The whole procedure was with
Bolen. (45)

Even more extraordinary was a filmed (movie) exp
[illegible] when he was visiting G
Ossining, New York. Bolen first tested a fork to see if i
bend easily manually, but it did not. Then Geller took

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and Bolen began to film Geller's actions. "Uri was moving his left thumb and index finger gently over the middle part of the fork as I was filming him," says Bolen. "He then said the metal was becoming soft and that it was beginning to bend. I zoomed in on his hands and the fork. I asked him to open his fingers to reveal the area. As he did, the prong part began falling away slowly, as though the metal had become plastic where he had held it. It then came completely apart, with the prong part falling down, but as it fell it drew away a short threadlike piece of metal. I examined both pieces of the fork at the break, which looked as though it had melted apart. Uri did not seem to feel any heat. He was excited and I was excited at having captured this on film, apparently for the first time. It was a heady experience." In another experiment, Bolen filmed Geller bending a key . . . (46)

Physicist Wilbur Franklin reported:

Dr. Edgar Mitchell and I first observed Geller fracture a ring, after which the ring continued to bend by itself as I observed it lying on the table beside me, on August 25, 1972, in the home of the venerable psi researcher, Dr. Andrija Puharich.

Parapsychologist Stanley Krippner observed Geller in one of his performances and wrote:

While a member of the audience grasped the earpiece of a pair of glasses loaned to Geller by another spectator, Geller held the volunteer's hand. I was sitting in the front of the room; as far as I could see, Geller did not touch the earpiece itself. Soon, the other earpiece began to bend as if tremendous heat was being applied. The volunteer removed her hand from the earpiece and the bending continued over the next few minutes, even though neither Geller nor the volunteer was touching the pair of glasses. (48)

In "SCIENCE NEWS" we have the report:

During the interview, I held a heavy key between my thumb and forefinger. The key began to bend-too slightly to be perceptible - after Geller rubbed it lightly with one finger. The key was then placed on the desk and it continued to bend slowly for several minutes until it reached about a 20-degree angle. There was no obvious way the key I supplied could have been switched. Geller had no chance (by slight of hand or other trickery) to bend the key by force. And he didn't have a laser up his sleeve, as some have suggested. (49)

Occasionally, Geller has also been the apparent cause of "teleportation" or "dematerialization" phenomena, However we shall confine ourselves to PKMB, save for this report by physicist Thomas Coohill in the company of 2 other physicists, among others:

We did not ask Geller to bend anything for us at lunch, nor did he suggest that he do so. However, after we had easten Geller and I went into my living room and began talking about caving (spelunking). After about a minute we both heard a metallic "clink": it sounded as though something metallic was dropped on a solid floor. Looking around, I saw a spoon lying behind my desk. It was bent.

As I held it in my hand and called the other people into the room, the spoon suddenly began to bend in another plane (at a right angle to the handle ...). It seemed as if the spoon were observed by all present. (50)

Another report reads:

Geller doesn't necessarily do what you ask him to do, but he can handle curve balls nicely - he likes the challenge.

Among other things, I took him a slinky (a spring steel coil that kids walk down steps) with the idea that he should try to change its molecules (so as if you can relate it through another demension-see Martin Gardner's THE AMBIDEXTROUS UNIVERSE). Of course, Geller did not such thing. He was like a boy with a new toy. He played it like an accordian for a few seconds then yo-yoed it up and down four or five times whereupon the bottom half of the spring steel coil dropped off onto the floor-all this right before my (and a friend's) eyes. Did Geller have a chance to get at this ahead of time? No, that's the point of bringing a "curveball" device. He doesn't know what you've brought; can't prepare duplicates, or otherwise tamper with the "props" as Johnny Carson calls them.

I showed Charlie Reynolds (a Geller critic) another of the curve balls I had thrown Geller - a set of ceramic magnets. Geller had made a crack through one of them and then made half of the broken magnet disappear. Reynolds broke one of the other magnets by hand. It took two distinct movements and made a less jagged break: this had also been my experience. Reynolds' response was that he'd like me to arrange a meeting with Geller. Unfortunately, Reynolds had already accused Geller of fraud at the TIME demonstration upon which TIME partly based its scathing March 12, 1973 story. So Geller wanted nothing to do with Reynolds. (51)

A common characteristic of Geller's attempts at PKMB is that he is often unsuccessful, although it is difficult to judge how often from the literature, since the media prefers to report only successes. A brief reference to this is given by Dr. Joseph Hanlon, after a sitting with Geller and Dr. Bernard Dixon:

I gave Uri my housekey, which he worked with unsuccessfully.

Dixon commented afterwards that he was struck by the extent to which Geller stressed his failures - constantly saying he did not think he could do it and telling us stories about his failures on TV and elsewhere. Indeed, he talked far more about failures than successes. (52)

A typical failure of PKMB was reported by Dr. Eldon Byrd:

The first thing I had Geller do was handle the block. (A metal alloy called nitinol). I told him that I wanted to see if he could alter the block's hardness. Also, I asked him if he would try to alter the magnetic properties of the material. He said he would try to do both.

He handled the block for some time. Finally, he said he thought he would not be able to do anything to it because he somehow did not have a "feel" for the material. In a last attempt to influence the block, he asked for a piece of metal of any kind, and a brass plate was given to him. He placed the block on the plate and held his hand over it. Several times he pressed down on the block, but gave up, saying that he did not think he would be able to affect the material. (53)

Claims that Geller cheats (uses non-psychic abilities) are not restricted to his time in Israel.

At least five people claim to have seen Geller actually cheat. This is a difficult area, because if we cannot trust the reports of observers who say Geller does miracles, why should we give any more credence to those who say he cheated? (56)

b) Controlled Observations

There are indeed critics who would argue that there have been no properly controlled experiments run with Uri Geller, but for the purposes of this review we shall consider those tests where investigators made serious attempts at controlled observation or where they have claimed them to be controlled. One of the earliest attempts to observe PKMB was made by Russell Targ and Harold Puthoff who were successful in having published in NATURE the results of ESP tests with Geller.

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One of their tests involved Uri's efforts to affect the weight of a weight placed on an electronic scale. It was covered by an aluminum can, also on the scale, and then the entire scale with weight was covered by a glass bell jar to eliminate the possiblity of deflection by air currents. The entire experiment was filmed. The first part of our protocol involved tapping the bell jar; next tapping the table on which the apparatus rested; then kicking the table; and finally jumping on the floor, with a record made on strip chart of what these artifacts looked like.

In this experiment Geller's efforts resulted in deflections correponding to weight gains and losses on the order of one gram, well out of the noise level. The signals he produced were single-sided pulses of about one-fifth-second duration, unlike the artifacts, which resulted in two-sided ocsillations that slowly died out. In tests following this experimental run, a magnet was brought near the apparatus, static electricity was discharged against the apparatus, and controlled runs of day-long operation were obtained. In no case were artifacts obtained that resembled the effects that occurred during Geller's efforts, nor could anyone else duplicate the effects. We have no ready hypothesis on how these signals might have been produced. (74)

Dr. John Taylor in England has reported a test which although he feels cannot be regarded as "absolutely fraud proof", avoids a number of possible fraudulent techniques available to Geller.

...Geller stroked the upper surface of a strip of metal which was screwed down to the top of a letter balance. The pressure he was applying could be monitored directly by the balance dial (accurate to 7 grams) as well as measured automatically by a shielded metal plate placed vertically above the metal top of the balance and connected to a quadrant electrometer (sensitive to 5 oz.). A bending of 10°occurred in one session, which I closely observed, during which no pressure greater than 10 grams was applied. In any case the bend was upwards. This experiment is presently being repeated with videotape. (75)

Parapsychologist and magician William Cox is confident of his test for PKMB with Geller. He reported in the JOURNAL OF PARAPSYCHOLOGY:

My hope was to witness static PK under what could be considered adequate safeguards. Being a magician myself, unknown to Geller, I also wished to allow opportunity for trickery in the event Geller intended to employ such means...

For the first test we used a flat steel key of the safety-deposit box type, untoothed and much too hard to bend by hand. I intentionally allowed Geller to handly it, whereupon he asked if I did not have an ordinary key instead. I said "No," and he replied, "Well, I'll try to do something with this one." He laid my key on a glass coffee table in front of the couch on which he was sitting, and we both noted its absolute flatness upon the glass. I was seated at one end of the coffee table. I placed my right forefinger lightly on the larger end of the key, and Geller gently stroked the remainder with his right forefinger. The key began to bend slowly at a point just beyond my finger, stopping at above 6°. Any pressure he might have applied would have been against the direction of bend. I removed my finger and let him rock the bent key upon the glass table.

I then placed a small mirror in the palm of my left hand and held it under the glass of the table so that I could have a clear view of the under side of the key. I then returned the key to its original position, and [illegible] to a total of 12¼°. His stroking was light, since it did not cause the key to rock beneath my forefinger. All of this took approximately a minute. The key was about 15 inches from my [illegible] not detected no semblance of trickery. (76)

Nitinol is a metal alloy which "has a physical memory fo shape in which it formed at the time of manufacture." Gelle tested for PKMB with nitinol wire by Eldon Byrd and he writ his second session with Geller:

The diameter of the wire was about 0.5 mm. One was used as a control and was not taken to Connecticut. tape recordings were made during all observations.

I held one of the other pieces by both ends as previously done and Geller stroked it as before. A kink forr took a second piece of wire, held it by one end, and stroked it unilaterally. It, too, developed a kink. The third of wire was given to Geller to do with as he pleased. He ro between his thumb and forefinger and it kinked shar

Geller had clearly influenced the alloy nitinol in a unusual way: it was as if the kinks he produced had ac been manufactured into the wires, even though it had conclusively determined before any experimentation th permanent configuration of the wires was that of straight No explanation has been given by nitinol experts, who been consulted as to how kinks could have been fo without using high temperatures and mechanical stress chanically produced kinks in nitinol leave obvious mar the surface of the wire. Geller-formed kinks do not.

Byrd concludes:

All of the bends that Geller had produced thus for a n wire have been permanent deformation - the wires ca crumpled or twisted into any shape by hand, but on heated to a temperature of about 210°F. all the wires ret the shape Geller had imposed upon them.

How did Geller achieve such results? At the pre have no scientific explanation for what happened during testing periods. I can say that the possibility of fraud on Ge part can be virtually ruled out. (77)

A team of scientists in England consisting of John Ha David Bohm, Edward Bastin and Brendan O'Regan observe following phenomenon:

The plasticization, by handling, of about 2 cm of the of a stainles steel teaspoon (phenomenon 7) took place course of informal conversation around a desk. The teas which had previously been handled and bent through thirty degrees by a child who also displays PK ability, was by Mr. Geller for a few seconds, when the center be floppy. A witness was able to take from Mr. Geller the two of the spoon in either hand while the center was still pla was then handled very much as a heated glass tube is wh bent to a desired angle in the laboratory. In this wa plasticity could be clearly verified by movement of the ha the witness. The witness attempted to set the spoon at an angle, and to put it down on the table; it retained itself piece on the table for a few minutes, but due, presumal thinning of the neck by the flow of metal, its strength small that a slight disturbance fractured it. The weight the fractured spoon was almost within the estimated mental error. Electron micrographs of this fracture are preparation; the procedures used are similar to those another study of a similar fracture obtained in the experi of Professor J.G. Taylor. (78)

John Hasted reported a PKMB test attended by physici Sarfatti:

Geller likes to have such specimens on a metal plat sheet of steel was laid on the table, and the following se [illegible] on it:

1. Two key rings with keys attached to them.
2. Four loose latchkeys.

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3. A thin steel tube containing a thermocouple.
4. A [illegible]
5. A single crystal ingot of vanadium carbide.
6. A single crystal disc of molybdenum, 0.22 mm thick and 1 cm in diameter.
7. A single crystal bar of silicon.
8. A length of steel rod, one inch in diameter.
9. An annealed copper disc with a hole in the middle.

None of these objects had been in Geller's hands, and he did not touch them while they were laid out. Jack Sarfatti stretched his hand out above the objects, and Geller then put his hand on top of Sarfatti's. After a few seconds, Jack reported feeling a sharp tingle in his hand, and when both hands were withdrawn we examined the objects. The only one showing an obvious change was the molybdenum single crystal disc, which had been perfectly flat beforehand, but was now bent slightly.

This single crystal, and some others we have used, had been given to us by Dr. Tony Lee, of the Cavendish Laboratory, Cambridge. It was of high purity, better than 0.99999. Some weeks later, when I showed the crystal to David Rooks, who was going to photograph it, we noticed that it was very slightly attracted to the tweezers he was using. Of course molybdenum should not be ferromagnetic, so I suspended the crystal between the poles of an electromagnet and found it to be quite as ferromagnetic as commercial molybdenum, which contains eighty parts per million of iron. I therefore sent the single crystal for neutron activation analysis to the Scottish Universities Reactor Centre. How this impurity got into pure crystal is still a puzzle. (79)

Finally we have a report by physicist Wilber Franklin using a strain gauge apparatus.

The experiment was videotaped, using three TV cameras at different angles.

A steel specimen, ⅜" thick by ½" wide by 8" long, was clamped to a tripod in the set-up shown in Fig. 1. After 29 minutes of unsuccessful effort by Uri, a highly-structured strain-gauge reading was recorded, shown in Fig. 2. This occurred just as the scientists and Uri stepped back a few feet from the apparatus, when the strain-gauge recorded the psi-effect. Meanwhile, another probe (see Fig. 1) attached to the end of the beam—which was sensitive only to vertical displacements—recorded no bending.

Geller had little or no knowledge of the experiments I would conduct, or of the one I would choose for him to concentrate on doing.

When the results of this highly controlled test are considered—along with the large number of repetitive results observed by Hasted and by at least four other laboratories—the influence of the volition of human subjects on metallic strain, and/or the associated equipment, seems to have met the requirements of scientific validity. In other words, the force of will can and does, in my opinion, affect matter. (80)

As in the anecdotal literature, Geller is not able to reproduce PKMB totally at will in every controlled situations. This was a problem that the Stanford Research investigation Targ and Puthoff ran into:

We spent the next several weeks attempting to film or videotape any sort of metal-bending under controlled laboratory conditions. One of Geller's main attributes that had been reported to us was that he was able to bend metal from a distance without touching it. In the laboratory we did not find him able to do so. When he was permitted to touch the metal, bending did occur. (81)

Beyond this difficulty investigators had further problems in working with Geller. Concerning a planned experiment with NEW SCIENTIST, and his overall evasiveness, Joseph Hanlon writes:

Uri has backed out on a written commitment to work with the NEW SCIENTIST. He backed out on a verbal commitment to work with the Maimonides Medical Centre Division of Parapsychology and Paraphysics in Brooklyn, New York. (83)

In a letter, Charles Honorton of Maimonides confirms:

Dr. Hanlon correctly states that Geller backed out of a verbal commitment to work in our laboratory.

Geller, of course, did not show up and after several repeated inquires, we learned from his staff that there had been a "miscommunication" regarding our commitment; that while he very much wanted to work with us, Uri was too busy to do so. He has continued to be too busy to do so. (84)

Geller's personality has indeed been in the way of investigators and the PKMB phenomoma, so much so that a number of parapsychologists feel that Geller is not a viable subject for study even though they may be confident that he can exhibit PKMB. Stanley Krippner writes:

Geller has been of little help in the field of psychoenergetic research; however, if he has drawn enough attention to the paranormal to interest some capable scientists in studying PK effects, his career will have served a useful purpose. Researchers may have learned lessons from the Geller affair and do better when a similar subject comes along. Researchers should think twice before spending their time and lending their prestige to an entertainer. (85)

(ii) Other Individuals Manifesting PKMB.
a) Anecdotal Data.

Uri Geller who is not only the most well known agent for PKMB, also has served as the catalyst for the other individuals found to have the ability. However, there is one historical case reported by D. Scott Rogo in an article by Mrs. I.K. Reno in 1905:

The Reno article concerned a rather conventional poltergeist outbreak centering on a family who lived in southern Georgia. The first manifestations noted by the family were spontaneous object-throwings. However, shortly after the inception of the poltergeist, the family witnessed a series of events which seem identical to what we have now labeled the "Geller effect." The article reports: "Frequently during the meal hour, milk, tea, coffee, and soup were flung into the faces of those at the table, several times inflicting painful scalds and burns. Spoons were broken, or suddenly twisted out of shape in their hands." (86)

Otherwise the manifestation of PKMB by an individual has begun after learning of Geller's ability, especially after exposure to a media program where Geller has performed. This phenomena has perhaps been most widely documented in Britain. A second hand report of a youth named Matthew Manning reads:

One night, being then seventeen, he was watching a TV special, "Uri Geller: Is Seeing Believing?" in which the Israeli psychic was demonstrating his metal-bending techniques when suddenly his mother exhorted him to see if he could match Geller. He didn't expect anything to happen, but to please his mother he grasped a stainless steel spoon and, while Geller was on the tube, started to rub it.

For a good ten minutes, not a thing happened. Then the boy's father walked into the room, and as happens in so many cases of this kind, the sudden distraction, the break in concen- [illegible] he felt the spoon drooping like heated wax, and it continued to bend until it resembled a hairpin. (103)

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Another report from Britain relates a typical incident:

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Cantor study). Children and adults throughout the country described their own PK gift. One seven-year-old boy made front-page news in a national paper, the DAILY MIRROR. "I decided to have a go after seeing that man on TV," he said. "I just think about the fork bending and it does. It was bit frightening at first—but there's nothing to it." The child's mother commented: "It has to be seen to be believed. It's just as well my husband runs two cafes, or we would be out of cutlery within days." Her husband admitted he was skeptical, "until I saw him perform the feat. Now I've seen him bend half-a-dozen forks without any failures." One of the paper's journalists saw the boy demonstrate. After twenty minutes a fork "was virtually bent double," he wrote. (104)

In the journal NATURE, Harry Collins and Brian Pamplin reported:

Sir,—We have investigated six young people who claimed the power of the bending objects by stroking in the manner demonstrated on television recently by Uri Geller and others. In this report we will call these people A,B,C,D,E, and F.

Subsequently, Dr. Pamplin appeared on BBC "Points West" local television news programme when B demonstrated her ability quite convincingly. The parents of DE and F subsequently contacted Dr. Pamplin claiming that their children could also bend cutlery by stroking.

Most of the subjects were first visited in their own homes where they showed their ability in the casual atmosphere of their sitting rooms. A succeeded in bending a weighed and measured rod of mild steel of 3/10ths inch diameter supplied by the experimenters as well as her own cutlery. (105)

From Denmark there is more anecdotal material provided by parapsychologist R.D. Mattuck in RESEARCH IN PARAPSYCHOLOGY 1976:

Lena Ilsted D, is an 18-year-old Danish girl who discovered her PK abilities after Uri Geller's visit to Copenhagen in January 1974. At the time of this investigation, she was studying languages at a gymnasium (junior college) in Denmark. Lena and I conducted 11 experimental sessions together, during the period April 1974 to March 1975, in the presence of her parents. In the first seven sessions, she was able to achieve striking effects, but not when adequate controls were exercised. Some of her insufficiently controlled phenomena were: bending 3.2 mm iron nails through 45°, changing the position of the hands on a watch by several hours, and causing 15 deflections of a compass needle. (106)

From Germany, parapychologist Lusi Wendlandt is quoted concerning two more children manifesting PKMB:

"One boy was able to mentally stop an electric saw that was cutting down a tree near his home," she reports. "We ask parents and witnesses for accounts of the phenomenon, but one of the biggest problems we have is obtaining better documentation.

"We gave the other boy, who lives in Switzerland, metal teaspoons placed in plastic flasks. These are first sealed by an attorney. At first we used glass bottles, but he returned them broken.

"At that time we thought he was just another trickster, but he denied this, claiming the bottles broke while flying around the room during the bending.

"After we switched to plastic containers," she continued, "a strange thing occurred." The spoons inside two of the flasks

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"However, even though the seals appear untouched when the flasks are returned, professional magicians claim they can break and reseal flasks. So we still can't call this foo

Finally, is an excerpt from a report to the Swiss Socie Parapsychology, the phenomenon occurring after Geller' television appearance:

"After we completed the second test, Edith Aufder complained of a severe headache. Now, she and I we ourselves. The others had left. While we were sitting living-room table, Edith picked up a teaspoon. Slowl began to rub it, almost as if she were caressing it. I watching her closely. After a few moments the spoon beg bend, without any physical pressures whatever. Durin next few hours she repeated this performance with two tional teaspoons, as well as with a solid steel pin and a p steel nail clippers." (108)

Many of those individuals manifesting PKMB other Geller are children (they have been dubbed "mini-Geller some), however there are similarities to Geller other tha PKMB itself. As with Geller, the ability seems to wax and and is not 100% reproducible on command. In addition the also reports of cheating on the part of some of the chil

Examples of the two characteristics will follow a surv controlled observations on the other individuals manife PKMB.

b) Controlled Observations

As with Geller, successful controlled observations a plentiful, however what has been published indicates abili least equal to those reported for Geller. In Britain, John H working with a number of children has reported much work.

Hasted's subjects succeeded in a wide range of e ments, including the psi-bending by children of small dia wires encased in hollow glass globes, usually withi minutes. Curiously, the bending always required a hole globe (2-10 mm), although skilled craftsmen, using s tools, could not bend the wires as quickly as could the ch using no tools. Some children could psi-twist long thin m bars at the rate of 2-3 rotations per second while one of his subjects recorded a torque at the limit of human strength.

Another report reads:

In one of his experiments, Hasted made simulta electronic measurements of the PK "strain" on three which were suspended from the ceiling of the labor equidistant and out of reach of his young subject. The show a comparable, but not exactly identical, force aff all three keys simultaneously.

In another study, aluminum strips which were left al a room became twisted and braided like pigtails within a of seconds. The subject was in an adjoining room. Elec strain gauges recorded a force on the metal unlike anythi would be seen by normal human bending. (120)

Finally is a report by Hasted RESEARCH IN PARAPSY LOGY 1976, where a sensor consisting of a resistive strain was the measuring instrument. Andrew G. is one of the ch in the Cantor study:

This apparatus has been used with several subjec cluding Nicholas Williams (age 17) and Andrew G. (ag Use of two and of three sensors simultaneously with Wi at seven sessions has produced synchronous signals strain pulses are pro when an otherwise undetectable moving "active su encounters and passes through the sensors. The sensc

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suspended from their electrical connections so as to define a line or plane oriented appropriately with respect to Williams, who is, so far as is possible, kept relatively stationary, being seated at a working surface and occupied in building model aircraft. He knows of the positions of the sensors and is asked to bend the latchkeys. The typical distance from the subject to the sensors is five meters, and between the sensors, one to three meters. The subject does not in general have direct contact with the latchkeys.

The total number of strain pulse events recorded was 81. Many contained considerable "fine structure," which indicates flexibility of the "surfaces." Typically, no visible bend results. The most usual configuration of the surface is vertical, and extending outwards from the subject, as opposed to extending around him. To a small extent the subject has learned to produce synchronous signals in other configurations. Since synchronous signals can be obtained with sensors on opposite sides of the subject the surface may be considered to contain his person. A surface has been known to extend in length to about 10 meters. The rate of travel of a surface between sensors is in the range of 10 to 100 cm/sec. On encountering a screening obstacle a surface flexes its shape around it, so that partial screening of the sensor advances or delays a strain pulse; a metal screen can augment the intensity of the strain signals and bring about bending and fracture.

The folding of pairs of thin metal strips and the twisting of pairs of wires have been recorded on many occasions. (121)

From Japan we have indications of controlled experiments from a brief notation:

After the visit of Uri Geller to Tokyo, Japan, in 1973, thousands of Japanese children apparently manifested similar paranormal powers. Eight of these children were investigated in 1974 by Dr. Shigemi Sasaki, professor of psychology at the Denki Tsushin University, Tokyo with a team of fifteen researchers. Laboratory tests were devised to test PK (psychokinetic ability) and metal-bending. One 12-year-old (Jun Sekiguchi) demonstrated an amazing ability to bend spoons paranormally, and also recharged dead electric batteries by merely holding them. Dr. J.B. RHINE of Durham, N.C., commented: "The tests in Tokyo have shown that PK power exists among many of their children. The research is of great significance." (122)

As mentioned earlier all of these individuals cannot perform PKMB completely at will, and again as with Geller, the critics have been quick to point out that failures are more common under controlled conditions. A.J. Ellison together with a select group of investigators could only report little success with child subjects.

We started these experiments with the children's attempts at the familiar spoon bending with closed-circuit television recording, and then went on to the single crystal specimens. Every specimen was accurately weighed before and after each trial. We had little success except that one of the single crystal specimens fell in half while being stroked. (127)

Cheating has been observed with child metal-benders after an investigation of those claiming to have PKMB ability. Hans Bender reports:

This enterprise made us acquainted with a number of persons, mostly youths, who claimed to be able to bend metal objects repeatedly, especially spoons. Most of them were tricksters. One demonstrated spoon bending before our eyes but failed when we tried to film it. Another moved metal objects under his hand; we were able to document the phenomenon on videotape. (123)

The European parapsychologist Hans Bender has also reported on an adult subject in a research brief.

Since 1975 I have done experiments with the Swiss designer Silvio, the most important genuine metal-bender we have [illegible] bent metal forks and spoons by holding them between two fingers have been recorded on videotape, as well as sessions in which he has bent a plastic spoon, silver coins, and an untouched spoon. In one session, Silvio was studied by Dr. Betz of the Institute of Physics of Munich University; he remarkably increased the resistance of an electrical device. The collaboration with physicists will be continued. (123)

In France, another adult subject has appeared by the name of Jean-Pierre Girard. The research here is by several teams of investigators and appears to be of high quality. The parapsychologist and magician, William Cox reports:

Jean-Paul Girard, a Parisian chemical firm employee who claims to be able to bend metal by PK, gave filmed demonstrations at Freiburg, West Germany, on September 4 and 5, 1976. Prof. Hans Bender was an observer and W.E. Cox was the experimenter. Nine bendings occurred in six bars (5/16 in. to 5/8 in. in diameter and under 1 ft. long) under close scrutiny and without any apparent physical explanation. (124)

William Wolkowski of the University of Paris, after preliminary observations with Girard writes:

We then embarked on a more sophisticated experiment which consisted of sealing different metal objects in Pyrex glass tubes; these were completely sealed with a torch. They were weighed with a precision of 10-4 grams and measured with a precision of 10-4 meters, and were left with Girard. Inside we had placed different metal objects such as metal paperclips and steel springs of the coil kind; when they were returned to us they were quite remarkably bent, from 10° to 30°. The steel spring, for example, which was straight at the beginning, was now so distended that at one point it could no longer move freely in the Pyrex tube. All the tubes were still the same weight and the same dimensions, and the glass blower could not detect any tampering. (125)

In February, 1978 an extensive research report appeared in the French metallurgical journal MEMOIRES SCIENTIFIQUE REVUE METALLURGIE concerning the PKMB of metal specimens by Girard. The authors were C. Crussard and J. Bounvaist. A short extract (translated) reads:

Here we will describe the test made on the thickest bar. This was a bar 17 mm in diameter and 300 mm long made of alloy AU2 (2.05 c/c copper) in state T4 (hardened in cold water and aged for one year). Reference marks were engraved in the mass of this bar, and the placement of small characteristic flaws were noted....

During the tests, the two experimenters sat at about a meter away on either side of J.P. Girard, who worked in shirtsleeves with his sleeves rolled up, without contact. J.P. Girard deformed this bar four times in succession by holding one end in his right hand and lightly touching the free part with his left hand.....or by placing his left hand five cm above the specimen. After each deformation, one observer took the profile of the test bar, while the other remained next to J.P. Girard. The two largest deformations.....could be seen with the eye: both were produced toward the bottom during a time on the order of 10-20 seconds. After each deformation, it was verified that no heating up could be detected by touching the bar with the hand, and that the bends made without force by J.P. Girard [illegible] inclined by 34 relative to the initial bending plane mentioned above), marked by the grooves indicated above. (126)

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III. THE DISCUSSION OF THE DATA ON PKMB

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i) THE CRITICISMS

In considering the criticisms of the recorded data on PKMB we shall confine ourselves to the "controlled data" where parapsychologists and other scientists are the experimenters, since it is these observations which will carry the most weight if conclusions are to be arrived at. Research in this area is unique in that fraud can exist at the level of the subject being observed. One can therefore assess the quality of an experiment in PKMB by refering to the two factors which can screen out the possibility of fraud, namely, physical controls and experimenter competence in detection of fraud. Indeed, the criticisms involve one or both of these.

In addressing the topic of adequate controls and safeguards, parapsychologist D. Scott Rogo has written:

> While I am open to the possibility of there actually being a PK-mediated "Geller effect," to this date I have found little evidence of such a process either in my own investigations or when critically evaluating the evidence and tests of others. (133)

A critique of work on PKMB done by South African parapsychologist E. Alan Price reads in part:

> Objects already secretly bent can be held even by a child to appear straight until the "power" is to take effect. Weakened metal can be bent more easily with concealed pressure. Old timepieces can often begin running again after a hidden shaking. A discussion of numerous other methods would fill books; in fact such books are present on magicians' shelves and have become more frequently available to lay people.
>
> Dr. Price seems to be well aware that carefully controlled laboratory experiments will be required to obtain definitive evidence of the "Geller effect." In providing possible subjects, his report is no doubt valuable. These reports themselves may be preliminary evidence of great undiscovered abilities. It should be understood, however, that phenomena "occurring in good light in the presence of responsible, outside observers" may just as likely be evidence of another ancient and well-known ability—the ability to deceive. (134)

The experimenter competence in detecting fraud has been substantially written by the critics. Martin Gardner of SCIENTIFIC AMERICAN is a confirmed skeptic.

> Any magician will tell you that scientists are the easiest persons in the world to fool. It is not hard to understand why. In their labortories the equipment is just what it seems. There are no hidden mirrors or secret compartments or concealed magnets. If an assistant puts chemical A in a beaker he doesn't (usually) surreptitiously switch it for chemical B. The thinking of a scientist is rational, based on a lifetime of experience with a rational world. But the methods of magic are irational and totally outside a scientist's experience.
>
> The general public has never understood this. Most people assume that if a man has a brilliant mind he is qualified to detect fraud. This is untrue. Unless he has been thoroughly trained in the underground art of magic, and knows its peculiar principles, he is easier to deceive than a child. (137)

In writing of the Geller controversy, Bernard Dixon, editor of NEW SCIENTIST, adds that experimenter bias is a contributing factor to experimenter competence to detect fraud.

> Another lesson of recent months has been that scientists are not necessarily as critical, sceptical, and obervant as their craft should require them to be. Putting aside the quite separate question of active willingness to believe, many trained scien- [illegible] more willing than might be supposed to accept the unexpected at its face value. The curious fact here is that the closed m [illegible] shown by the scoffer who dismisses all talk or evidence o [illegible] absurd, also manifests [illegible] among researchers who are drawn into positive belief fo [illegible] very reason that the evidence appears to conflict with [illegible] previous conceptual picture of the world. There is, surel [illegible] intriguing field here for psychological research into the [illegible] chinery of belief. (139)

Another factor is one of viewpoint in the experim [illegible] situation.

> The matter of who is actually in control may objective [illegible] quite different from the vantage point of the experimente [illegible] the subject. When Houdini escaped from a prison c [illegible] presume the prison warden thought he was in control an [illegible] Houdini. When Randi fooled the editor of PSYCHIC NEW [illegible] editor presumed he was in control. The whole point of de [illegible] tion is to secretly have control in a way unknown to the s [illegible] tator/experimenter. (140)

Through Randi some professional scientists have seen [illegible] hand the full meaning of competence to detect fraud. [illegible] certifying Geller as manifesting PKMB, physicist Jack Sa [illegible] retracted in SCIENCE NEWS:

> I have witnessed The Amazing Randi fracture meta [illegible] move the hands of a watch in a way that is indistinguish [illegible] from my observation of Geller's "psychokinetic" demon [illegible] tions. Also, I am advised of Randi's demonstration of ca [illegible] bursts in a Geiger counter and of deflecting a compass nee [illegible] reported in a letter from Kings College, University of Lo [illegible] (July 11, 1975) signed by Maurice Wilkins, F.R.S., and [illegible] other faculty associated with the Department of Biophy [illegible] (143)

The critics have put much of PKMB research into a [illegible] perspective, and although demonstrating that fraud was p [illegible] ble, it does not prove that fraud occurred: Scientists do re [illegible] strong quarantees of fraud proof conditions, both physical [illegible] experimenter based.

ii) THE DEFENSE

In response to the criticisms, it seems that the major [illegible] parapsychologists have agreed, and have attempted to i [illegible] porate suggestions. Parapsychologist A.J. Ellison in a lett [illegible] NEW SCIENTIST states:

> I fully agree that physical scientists can be exceed [illegible] naive when outside their own fields—well known to magi [illegible] and parapsychologists. Experience of working with a varie [illegible] genuine psychics, preferably over some years, is esse [illegible] training for an investigator. There are many factors invo [illegible] primarily relating to psychological matters and especiall [illegible] unconscious mind. It is sad to see recently "conve [illegible] physical scientists trying to investigate parapsychological [illegible] ters outside their field of experience. A year or so ago son [illegible] us formed a multi-disciplinary committee to study the so-c [illegible] Geller-type phenomena and included physical scientists, [illegible] chologists, a doctor, and a magician (with a second ex [illegible] ionaly knowledgeable consultant), several of those mem [illegible] having deep experience of parapsychology. Experiments [illegible] ned by such a committee for Geller and the many others c [illegible] ing similar faculties in the light of all that is known abou [illegible] diffcult and recondite subject seem to me to be most like [illegible] lead to something useful. (146)

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In fact, [illegible] reported where this [illegible] has been confronted. Hans Bender reports:

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A professional magician, Rolf Mayr, drew our attention to a 33-year-old Swiss designer, Silvio (he wanted to hide his family [illegible] who, to his great surprise, convinced him of the genuineness of [illegible] is performance. In a most welcome collaboration with this [illegible] magician we started an investigation of Silvio's metal-bending abilities with the intention of documenting his performances by films and videotapes. We brought along a professional cameraman and provided spoons and forks that we had examined and marked. Our first success came in December 1974. Silvio held the object between his index finger and thumb at its thinnest part; from time to time he held the thumb of his left hand over the fingers of his right hand. Without the spoon's being rubbed, the scoop of the spoon bent with a bending radius of over 70 degrees. In this first sitting, Silvio bent five spoons, breaking two of them; he also bent a massive fork in an upward direction, as had intended.

We feel that our collaboration with the professional magician is a very favorable condition for obtaining results which ought to convince even professional skeptics. We hope that the secular controversy between parapsychologists and magicians can one day be transformed into the kind of cooperation we are achieving in our Berne experiments. (148)

Data with Geller as subject and magicians as experimenters are documented. Arthur Zorka of the Occult Investigations Committee of the Atlanta Society of Magicians reports:

The tests took place in a room which contained no mirrors, no windows, and one door, by which we entered. The door was locked behind us. Mr. Dickson (also a member of the committee), Mr. Geller, and I sat facing each other. No one else was present or in the near vicinity of the testing area.

The first test involved Uri Geller's attempt to bend a fork which I provided. The fork was made of forged steel, with a nylon reinforced handle. I specifically selected this fork because of its extreme resistance to physical stress. I placed the fork into Mr. Geller's outstretched left hand. His fingers curled around it, and in moments, without the fork leaving my sight for even an instant, it literally exploded, sending fragments of the handle across the room. (149)

Magician Leo Leslie reports:

After his demonstration of telepathy Geller tried psychokinesis. A nickel-plated, enameled key was given to Geller. He asked the journalist who was present to hold the key between two fingers. Geller then rubbed it a couple of times, very lightly, with his forefinger. "I can't do it," he suddenly said. "You have done something to this key. I cannot get in contact with the metal." I immediately suspected that Geller probably uses a chemical to soften metal, and that with the coating on the key he felt defeated. I took the key from the journalist and studied it closely. But while I sat looking at the key the enamal suddenly started to crack, and a second later strips of the nickel plating curled up like small banana peels, while the key actually started to bend in my hand. (150)

There are critics who are beginning to look more favorably at some of the PKMB research. Concerning Jean-Pierre Girard and his investigator C. Crussard, Joseph Hanlon wrote:

Crussard involved a magician at an early stage—the French illusionist Ranky has issued a public statement saying that in the tests he watched, he could not see how Girard could have used tricks. And his involvement more recently of Randi, probably the best spoon-bender in the magic business, continues to show that these experiments are on a much higher level. Chris Evans commented: "I was impressed by their honesty and their determination to do things properly. I feel very strongly that they are treating this in a proper scientific manner—quite different from any other so-called scientific studies of this that I have seen. Evans remains a complete skeptic, but he admits that "Girard is quite the best I have ever seen. If this was fraud, it was very clever." (152)

And again in a later article:

Experiments with people are very hard to do and require years of skill and patience. It does not help, then, that most parascientists are physical scientists with little or no behavioral science background. Their initial tests are often laughably sloppy. They think, for example, that if they crowd enough observers into a room then everything will be OK, when Geller proved it much easier to cheat in those circumstances.

Yet, the past four years have seen a major improvement in experimental techniques; one-way glass, tight controls of materials, and even controls of the experimenters. And we have seen recently the archest of sceptics agree with one of the strongest proponents on protocol. We seem to be rapidly approaching a definition of the dragons to be slain.

Sadly, as conditions get tighter, the phenomena seem to disappear. But if parascience has so far produced precious little, neither has the much better funded cancer research. And there is a curious similarity between the laetrile and parascience controversies—both rest on anecdotal data that do not stand up to traditional scientific scrutiny. Could it be that our science is wrong—that some things are only amenable to uncheckable personal report? To accept that would be as revolutionary to science as the Protestant reformation was to Rome or the inevitable socialist revolution to Britain. Clearly a lot of people think that such as overthrow of science is called for. But if they do, then there is little point in, at the same time, trying to enter the inner circle of institutional science. (153)

This brings us back to a phenomenon observed in the data on PKMB. It seems as though certain kinds of controls can be inhibitory to the manifestation of PKMB effects and parapsychologists have gone as far as labelling it "the shyness effect." The team of Hasted, Bohm, Bastin and O'Regan addressed this topic well in their NATURE paper:

We have come to realize that in this domain the experimental situation is different in certain crucial ways from that which has been common in scientific experimentation. This is because the phenomena under investigation have to be produced from the minds of one or more of those who participate. Relationships among the participants therefore play a much more essential role than is usual in traditional scientific fields.

One of the first things that reveals itself as one observes is that psycholkinetic phenomena cannot in general be produced unless all who participate are in a relaxed state. A state of tension, fear, hostility, on the part of any of those present generally communicates itself to the whole group. The entire process goes most easily when all those present actively want things to work well. In addition, matters seem to be greatly facilitated when the experimental arrangement is aesthetically or imaginatively appealing to the person with apparent psychokinetic powers.

We have found also that it is generally difficult to produce a predetermined set of phenomena. Although this may sometimes be done, what happens is often surprising and unexpected. We have observed that the attempt to concentrate strongly in order to obtain a desired result (the bending of a piece of metal, for example) tends to interfere with the relaxed state of mind needed to produce such phenomena.

Thus, if any of those who participate in a physical experiment are tense and hostile, and do not really want the experiment to work, the chances of success are greatly dimin[illegible] [illegible] of the experimental setup often helps to maintain interest and enthusiasm, whereas a[illegible]

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attitude that consistently tends to damp these latter is evidently detrimental to the whole enterprise. In the study of psychokinetic phenomena, such conditions are clearly much more important than in the natural sciences, because the person who produces these phenomena is not an instrument or a machine. Any attempt to treat him as such will almost certainly lead to failure. Rather, as indicated earlier, he must be considered to be one of the group, actively cooperating in the experiment, and not a 'subject' whose behaviour is to be observed 'from the outside' in as cold and impersonal manner as possible.

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And concerning the involvement of magicians they continue;

It has been our observation, however, that magicians are often hostile to the whole purpose of this sort of investigation, so that they tend to bring about an atmosphere of tension in which little or nothing can be done. (154)

This factor of experimental conditions is also noted by Joseph Hanlon:

One of the potential difficulties of parapsychological investigation is the sensitivity of the whole phenomenon, and the inability of even "good" subjects to perform under many seemingly reasonable, controlled conditions. If one accepts the existence of parapsychological abilities, this is not surprising. One would, presumably, be dealing with a talent like musical ability, and it would be not unreasonable to find a skilled violinist, for example, being adversely influenced by playing before a group of people he knew to be hostile critics. Also, because we are dealing with "mental energies", it is not unreasonable to suppose that a confirmed critic could use his psychological powers to block those of the sensitive.

Thus, the phenomenon will require somewhat different procedures than other forms of research. Some concessions will have to be made to keep the subject happy and comfortable, for example. (155)

Indeed, it is clear to see that setting up experimental controls without reference to this fact may lead to a lack of positive results. It is perhaps clearer to see the point if one makes analogy to intuitve or non-rational psychological functions such as romance, "Psychic powers, too, tend to emerge spontaneously, if at all, so that it has been about as much use asking a man to exhibit them in a laboratory as it would to ask him to fall in love at first sight with the lab. assistant." (156)

I do not defend or deny ESP or other parapsychic phenomena. I offer an analogy.

In the past I have written some poems of quite good quality. Whole poems or the major part of them have seemed to be deliverances of a subconscious region of the mind. They came spontaneously as though they wrote themselves.

A skeptic could say: "This is nonsense. I cannot believe it unless Hoffmann writes a genuine poem under carefully controlled conditions."

Under such conditions I would be seated under observation by psychologists. Instruments would be fastened to me to record blood pressure, cephalic electric waves, cardiographic pulsations, and maybe other recordings. Then I would be told: "We are ready now. Write a poem."

Under such conditions I would not be able to write anything but some exasperated cusswords. Consequently I would have been proved a fake and a fraud. (157)

IV THE DEEPER ISSUES

ii) PKMB IN PERSPECTIVE

When the phenomenon of PKMB is considered in terms of practical relevance, aside from philosophical implications for the para[illegible] have viewed this whole affair in a refreshingly lighthearted way:

Incidentally, young Uri shares a characteristic in com[illegible] with everybody who claims to exercise occult powers, whi[illegible] that he only uses his remarkable gifts for the most trivial [illegible] mundane ends. Your medium chatting up the spirit world [illegible] never do more than extract small talk from his contacts in [illegible] Great Beyond. "Tell Aunt Edie to be sure to wear her w[illegible] vests in this cold weather," and so on. Uri fiddles around [illegible] cutlery and trinkets and the rest. As a good Israeli he ought t[illegible] out there by the canal twisting the barrels of the Arab gur[illegible] that they fire backwards. (178)

In a letter to NEW SCIENTIST we have:

Sir,—When he heard that Uri Geller's accomplishm[illegible] were to be examined by a panel selected by NEW SCIENT[illegible] John Wade, a distinguished member of the inner council o[illegible] Magicians' Circle said to me: "What a number of us would [illegible] to know is not how Geller bends forks and keys and things, [illegible] why?" (179)

Author John White makes an apparent point:

His psychic functioning has so far not been put to be[illegible] cial use for humans, Uri has not, to my knowledge, he[illegible] anyone or relieved human suffering. He hasn't used his [illegible] ability to straighten bent forks. (After all, who needs bent fo[illegible] (180)

He has perhaps suggested a possibility. Perhaps it [illegible] abilities are useable, they may be useful on biological syste[illegible] Psychic healing is also a considered possibility in parapsy[illegible] logy.

Looking back over the data and the controversy, we [illegible] voluminous evidence suggesting the validity of PKMB, we [illegible] seem to have equally voluminous evidence denying it. M[illegible] parapsychologists feel that the data is at least leaning in fav[illegible] PKMB. John Beloff and Charles Tart who are well-respected in [illegible] field comment respectively:

Let us start with the question that must be asked of e[illegible] paranormal claim, namely, the question of authenticity. To [illegible] reviewer, at least, the Geller case has long since passed [illegible] point where it is sensible to doubt that Geller posse[illegible] paranormal powers except, that is, in the purely theore[illegible] sense in which all psi phenomena are open to doubt. If aske[illegible] justify such a statement, my first impulse would be to reply [illegible] no one in the world could be that clever! However, I rea[illegible] that this intuitive judgment is scarely going to satisfy [illegible] skeptics.

The case for regarding the specific "Geller effect [illegible] authentic (i.e., the paranormal bending of metal objects) st[illegible] me as even more indisputable if only because here there a[illegible] many independent witnesses. (181)

Whether Geller is "pure," as some believe, or wheth[illegible] uses conjuring sometimes but occasionally shows parano[illegible] abilities, as many parapsychologists now believe, is of [illegible] consequence. More than 500 methodologically tight, ex[illegible] mental studies that show various paranormal effects alr[illegible] exist, none of them depends on the ability of Geller, wl[illegible] probably only a passing fad.

The known physical laws indeed appear to bend so[illegible] times and the implications of such paranormal effects fo[illegible] understanding of ourselves and the universe may be enorm[illegible] Geller has drawn enough attention to the paranormal to [illegible] some very bright scientists interested. If it takes key [illegible] spoon-bending to get us started on a large-scale scie[illegible] investigation of the paranormal, the career of Uri Geller [illegible] have served a useful purpose. (182)

What is more interesting however, is that a few of the c[illegible] [illegible] worthy of study. Jo[illegible] Hanlon, who remains skeptical of PKMB, still has written:

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I feel strongly that the next interesting breakthrough in science may well come not from expensive research by huge teams [illegible] individuals and small teams into the interaction of people and themselves and their surroundings.

Through biofeedback, we now have control over our bodies of a sort that not so long ago was almost universally agreed to be impossible. Negative ions in the air seem of affect our attitudes. And so on. In the past few years, these areas and others such as parapsychology have become less the province of hopeful amateurs and more the area of trained scientists. (183)

And sober critic Ray Hyman has written of the paranormal:

Parapsychologists are doing much more sophisticated research than many critics and indifferent scientists realize; and if nonparapsychologists took the time to read the current parapsychological journals, most of them would discover that the field contains a solid core of dedicated, serious, and competent experimenters. Furthermore, it is difficult to read through this literature without coming to the conclusion that "something" is there. (184)

Perhaps the best stance one can take towards the issue of PKMB and its controversy is at least one that is not closed. Editorials in two of the most distinguished scientific journals have encouraged openness to the field, and perhaps it is the safest stance. In NATURE is printed:

The parasciences may not yet have unearthed much for which there is a cast-iron case for scientific explanation, but there is ample material crying out for verification, and the lessons learned over the last few years should have improved techniques and procedures for getting to the heart of the deception/reality question. Now, surely, is the time for scientists in large numbers to take a more practical interest in these obstinate issues. If we fail to do so, parascience will recede further into the mystic's world and will take with it much of the public's sympathy.

Investigation in the para-world is neither easy nor always agreeable. Public interest, however, demands, rightly or wrongly, that scientists come to grips with the propositions being made. And if scientists won't come in with rational attitudes and, where necessary, rational explanations, they can hardly be surprised if the forces of irrationalism take over. (185)

And in NEW SCIENTIST we have:

The temptation is always to be negative, to dismiss bizarre notions as impossible and unexamined evidence as inadequate. And researchers who have once invested valued time in a fruitless pursuit of bent cutlery or empathetic tomatoes can become even more haughty than those who have never been blooded in these woolly areas.

Patience and persistence form a better stance. Science must remain open to strange possibilities, even when they come from the most unlikely quarters. Scientists must remain cool, and committed to determined proselytising on behalf of tion and sloppiness are vital in examining heterodoxy. Impat- [illegible] unproductive, and antipathetic to the spirit of science. (186)

IV. DIRECTIONS FOR THE FUTURE

We must consider how best to proceed further. Perhaps continued validation of PKMB is not the most productive. Speaking to the pro/con controversy Author Hastings writes:

These two positions have given rise to a controversy with attacks, charges, and countercharges. The issue is the nature of Geller's abilities. Is he a trickster using magic? Is he a genuine psychic? Is he a person with some real psychic ability and who also uses deception when he wishes or has to?

I think it will prove better not to draw any of those conclusions, or any conclusions at all on that level. It is too late for that. The argument over Geller has become a Gordian knot, in a rope that we do not need. (187)

Parapsychologists Ted Bastin and Charles Honorton have offered us what may be the optimium approach to PKMB. Bastin writes:

I think that, at the present moment, it is a good thing for at least some investigators of the paranormal, with material now coming to hand in an unprecedented volume, to aim to get information about the regularities and shapes that are discernible in the material, rather than endlessly to repeat proofs of their existence. One important way to demonstrate the existence of a field is to map it out. (188)

Honorton writes:

There are those who believe that satisfactory explanation of the anomalies studied in parapsychology will require major modifications in scientific theory. This is debatable. What is not debatable is that the anomalies will remain anomalous so long as attention is maintained on "conclusive proof" of the claims of flamboyant psychic superstars, rather than the systematic delineation of positive attributes and necessary conditions for the phenomena in less spectacular but more cooperative subjects. (189)

However, this reviewer has preferred this eloquent expression by a philosopher:

Research into the paranormal is bogged down in the boring question of whether it exists to the exclusion of the question of what it is. Neither does this remark prejudge the former question, for if it does not exist then it will prove impossible to say what it is and we answer the boring question by our failure to answer the interesting one. This I submit is a better method. (190)

MR. SAT BIR SINGH KHALSA, graduate student in neurophysiology at the University of Toronto who at my request in 1978 became involved in the meticulous and time consuming task of further reviewing the diverse literature on this topic. His tireless dedication to this difficult project has provided much valuable information and he has gained my deep respect.

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