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A Photogenic Mind: Comments on Dr. Jule Eisenbud's *The World of Ted Serios*¹

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INTRODUCTION

The publication of *The World of Ted Serios: "Thoughtographic" Studies of an Extraordinary Mind* by Dr. Eisenbud is an extraordinary event. "Thoughtography" is the alleged effect of mind on the emulsion of photographic negatives or prints. Sometimes the presumed agent is deceased, as in the case of "spirit photographs." In other cases—for example, the present one—the agent is a living person. Until now this area of presumed psychical phenomena has been outside the scope of scientific scrutiny, with one notable exception, a study published in 1931 by T. Fukurai of Kohyassan University, Japan (3). In the case of most "psychic photographers" the effects were either shown to be fraudulent or easily could have been. Part of the process necessarily occurred in darkrooms which, rightly or wrongly, produced suspicions of psychical flimflam.

It is indeed interesting to see this murky area brought into daylight in Dr. Eisenbud's research. Ted Serios had already bypassed the darkroom stage and was using Polaroid equipment when Dr. Eisenbud came on the scene. Serios' use of Polaroid and the fact that the phenomena were observed by many scientists and professional people whom Dr. Eisenbud brought into the experiments will assure the findings an attentive audience.

The book is directed at the intelligent lay reader and generally does not go into detail about the conditions under which the images were obtained. As a rule, scientists prefer to give a detailed presentation of their findings to their colleagues before a popular review is made. However, matters do not always progress in such an orderly fashion, especially not in parapsychology, and especially not for a researcher who, as Dr. Eisenbud, had to rely on his own resources of funds and time. In any case, it may be doubtful whether a more detailed presentation would have been significantly more convincing than the general survey given in the book. As we have seen before, it is not the excellence of the experimental conditions which carries conviction as much as the ability of other investi-

¹ New York: William Morrow & Co., Inc., 1967. Pp. 367. \$6.50.

gators to duplicate the results. Dr. Eisenbud is aware of this: "... the force of the data presented in this book will soon enough become attenuated to the point of extinction unless specific consequences follow from their publication" (p. 154). Two "almost indispensable ones" are (a) others besides Mr. Serios should be found to possess "thoughtographic" abilities and (b) Mr. Serios' abilities should be verified by other scientists. A valid judgment of Dr. Eisenbud's research and the present book will only be possible when these two conditions have, or have not, been met.

A few things can be said emphatically. This is a highly entertaining book. Ted Serios, a former elevator operator, is an extremely vivacious person both in and away from the sessions, particularly when primed with alcohol, an apparently necessary ingredient for the phenomena. The story of his encounter with the Denver academic community is related with great wit and warmth. The sections that do not directly concern the pictures are often insightful. For instance, to explain the resistance to findings suggesting that a person can affect his environment, including other people, with only his thoughts and emotions, Dr. Eisenbud postulates a "need of man . . . to project farther and farther from himself his responsibility for the evil that goes on around him" (p. 319); "... might one not surmise," he asks, "that there would hardly have to be this concerted effort on everyone's part were there not, somewhere in the background, a lurking fear of a core of reality behind what is so forcefully denied?" (p. 316).

The highlights in the book, of course, are the accounts of the sessions where Ted Serios produced his photographs. These generally show buildings and other inanimate structures either in full or part; pictures with people are less frequent. The phenomena were first brought to the attention of Dr. Eisenbud by Mr. Curtis Fuller, editor of *Fate*, who sent him an article by Mrs. Pauline Oehler (5) describing the strange images produced by Serios on photographic film. A preliminary experiment arranged for Dr. Eisenbud by Mrs. Freda Morris, author of an interesting paper on the history of thoughtography (4), convinced him that something unusual was taking place and Serios was invited to Denver. From the very beginning, Eisenbud brought in any member of the scientific or professional community he could buttonhole. A typical session finds Serios getting gradually more and more inebriated and unruly, surrounded by members of Denver *academia* awaiting the magic words, "gimme a camera!" There are amusing and dramatic moments in this story of a drunk ex-elevator operator plying the ivory tower.

The 339 pages of text are illustrated with more than 150 photo-

graphs, most of which are ostensibly parapsychological. There is a nine-page bibliography and an index.

A few words about this review. The method of organization in Eisenbud's book is literary rather than scientific. Consequently, information about a topic often has to be extracted from many places. Even the target situation, to which a chapter is devoted, can be surveyed only by examining most of the pictures and text. In the hope that it will assist the reader in appraising the material, I have arranged it under certain headings. In the course of this work, various features emerged in the data which may point to the processes underlying Serios' pictures. I have presented this material as well.

THE EXPERIMENTS

The Equipment

The experimental equipment generally consisted of only three parts, camera, film, and "gismo." Often two or more cameras were used, as a rule, the Polaroid Land Model 95. There is only one way in which light normally enters the camera and affects the film; namely, through the lens opening when the shutter release lever is pressed. Unless the camera is damaged or interfered with, the only other way in which light can enter is when the back is opened. However, this should only happen when a new film is inserted.

As in the trials before Ted Serios (or Ted, as he prefers to be called) came to Denver, the focusing lever was always set at infinity. After the preliminary experiments, Jule Eisenbud (J.E.) set and kept the lens opening at $f/11$, and the shutter speed at one-thirtieth of a second. The time exposure knob was taped down to prevent fraudulent "whities" (see next section) by overexposure. The Model 95 is equipped with a wink light which is activated when the shutter lever is pressed. This wink light was used in most cases. Cameras supplied by J.E. and his colleagues were invariably used.

The film was generally high-speed Polaroid Type 47 black and white. This again was either provided by the witnesses or by J.E. With Polaroid equipment the developing occurs immediately after a picture is shot and lasts from ten to fifteen seconds. This whole operation is public and Ted has no contact with the camera or film.

The gismo is a small tube, about an inch long and an inch wide. It is usually made from the black wrappings of the Polaroid film pack. It has no known function in the tests. Ted holds it up to the camera lens in order, he says, to reduce the amount of light

and normal imagery entering the camera. The gismo was always subject to inspection and, on occasion, was made by the experimenters.

General Conditions

The experimental conditions varied considerably. In some cases, such as the series of tests conducted in an auditorium of the Medical School at the University of Colorado with a committee appointed by the local branch of the American Psychiatric Association (A.P.A.), the investigators appeared to be in full control over all facets of the tests. Not only were the cameras and films supplied by them, as in the other sessions, but Ted was searched and sewed into a monkey suit, presumably to prevent the use of gadgets which might be hidden on his person. Moreover, the lens of the camera was covered with masking tape to prevent images from entering normally. As in other sessions, control shots were taken, but here they were randomized according to random number tables.

When nothing but "whities" resulted, J.E. thought that the laboratory conditions inhibited Ted and they were made more informal. The trials were removed from the auditorium to the homes of the committee members and other interested persons. Experiments were also conducted in technical laboratories to study special problems. Except for one of these tests, Ted was no longer required to wear a monkey suit and generally was given more freedom. However, he never had anything to do with the loading of the cameras or removing the prints. Control pictures were taken at various times during the sessions as decided by J.E. and the other observers.

The more than forty sessions conducted under these conditions provide most of the material described in the book. As a rule there was at least another witness in addition to J.E. and often several. Most of them were required to submit signed forms indicating the number of distinguishable structures obtained on the pictures, the number of other prints with unusual effects, such as "blackies" and "whities" (which I shall describe shortly), the conditions of observation, and any explanation the witness might have of how the effects could be produced normally. A partial list of the names and positions of the observers is given. Of the thirty persons listed, twenty are members of university faculties, sixteen have M.D.'s and six, Ph.D.'s

THE FINDINGS

The photographic effects obtained by Ted can be divided into four kinds: "blackies," "whities," relocations of persons and furnishings in the room, and structures.

"Blackies"

The term "blackie" refers to a completely black print. Such prints are produced if no light strikes the film; for instance, if the palm of a hand is held over the lens or gismo. On several occasions there were blackies when the lens was not obstructed and when the flash of the wink light indicated that the shutter was pressed.

The most interesting series of blackies was obtained during a session in a television studio. J.E. and Ted were in different monitoring boxes separated by thirty feet, each facing an image of the other on a TV screen. Of about fifty tries, half a dozen blackies resulted with J.E. triggering the camera in front of Ted's image when several thousand watts were streaming into the unobstructed lens (p. 337). (I assume that control pictures were taken and that they showed no effects. Otherwise, malfunctioning of the shutter mechanism cannot be ruled out as an explanation.)

As a rule, however, J.E. does not emphasize this effect, probably because it can fairly easily be reproduced normally or inadvertently by blocking light with the gismo, hands, etc. On one occasion (p. 280/n), a blackie was obtained during a control shot suggesting some human or mechanical error.

"Whities"

A "whitie" consists of a completely white print. This effect can be produced by overexposure; for instance, by pointing the camera at a lamp.

In an experiment attended by four members of the University of Colorado Medical School faculty, whities were obtained when the palm of one of the witnesses was held over the gismo, apparently blocking out the light, and when the camera lens itself was covered with a layer of masking tape. At this stage, the time exposure knob had not been taped down, but in subsequent tests it was. For instance, in an experiment by J.E. with two fellow psychiatrists, sixteen whities resulted from thirty tries with the taped lens camera (p. 88). They could not be reproduced on control shots.

In an experiment at the Medical School auditorium before the district branch of the A.P.A., a few whities were again obtained with the hands of the participants over the lens. A committee of

four was appointed by the A.P.A. to pursue these experiments and several tests were done in collaboration with this committee. In one of these tests, it is stated, whites were obtained when the camera was held and triggered by the experimenters (in the others Ted presumably operated the camera himself). In the last of the formal auditorium tests, Ted produced two whites and one blackie in the space of two minutes. He then collapsed on the floor. One of the participants took eight photographs of him lying thus, each time producing a white (pp. 96-97). It is not stated if controls were taken on that occasion. Whites also turned up at the informal sessions. On one occasion, they were obtained with a nonexposed film pack; on another, with infrared film. They were also produced during trials where sheets of lead, 1/64 inches thick, were used which covered the film except for areas that varied in size from minute pinholes to openings of a couple of inches. Ted was not informed about the size or shape of the cutouts. Out of thirty-two trials, about a dozen prints had white areas corresponding with the perforations in the lead (Figs. 137 and 138).

Relocations of Furnishings and Persons in Room

Another effect consists of images of the experimental room which do not coincide with the part of the room at which the camera was aimed. J.E. points out that such images can sometimes be produced fraudulently. If a picture is surreptitiously taken in one part of the room and the camera is later brought to another part for the experimental photograph, and if this is taken under conditions that prevent light from entering the lens (say, because someone's hand covers the gismo), the developed picture will show the previous scene. In fact, Ted once seemed to try for such an effect (pp. 137-138). In some instances, the witnesses were satisfied that there was no opportunity for trickery. In one of these, Ted had no contact with the camera immediately before the picture was taken. One of the participants triggered the camera behind two partitions to the room where Ted was seated while another covered the lens with his hand. The image (Fig. 55) showed a third participant who, at the time, was in the room with Ted. On two occasions with the camera and gismo pointed at Ted, the pictures (Figs. 56 and 57) showed the room as seen from Ted's position. Another time, a curious montage (Fig. 59) was produced suggesting multiple exposures which included some objects that could not be identified.

Structures

The most interesting effects are the prints showing buildings and other structures. These were generally obtained in the homes

of the witnesses or in the technical laboratories. At each session, J.E. says, Ted obtained ten to forty distinct pictures of structures on two or three different themes.

Only a few of the trials are described in detail. Among those that seem most difficult to account for in terms of trickery are the following. In a session in which Ted asked an experimenter and his thirteen-year-old son each to hold and trigger a camera, while he himself handled the two gismos, different buildings (Figs. 66 and 67) showed up. Another time, he arranged for three cameras to be used simultaneously, one by him and the others by two experimenters three feet away. A third experimenter placed his hands over the gismos that his colleagues held at their cameras. A building turned up on Ted's camera (Fig. 58), the second gave a blackie as expected, and the third, the montage effect (Fig. 59) already mentioned.

In six cases, including Figs. 44, 45, and 47, one of two children (ages eleven and thirteen) of a participant held the gismo at Ted's request while the other held and triggered the camera. In another case (Fig. 48), the father held the gismo and his thirteen-year-old son held and snapped the camera. Two "embryonic forms" (p. 147) of the theme that came through in Fig. 58, where Ted himself was in charge of camera and gismo, appeared earlier when he was two feet from them and when they were operated by a participant. Also in a series of images on the Fig. 67 theme, a participant held and triggered the camera as well as "officiating with the gismo" (p. 168).

In one case an image (Fig. 51) appeared when the camera, again on Ted's instruction, was held fifteen feet from him and pointed away. In a session with Ted hooked to an electroencephalograph while an experimenter worked the camera, two images of the Central City Opera House were obtained (Figs. 125 and 126). In a test with Ted in a Faraday cage, J.E. held the camera outside the cage a couple of feet from Ted and some inches from the door to the cage. A second experimenter held the gismo. The image seemed to show three officers (Fig. 127). Two experiments were done in a room lined with lead to screen out X-ray radiation. In both, structures were obtained when the camera was held outside and up to the window in the door while Ted was inside (Figs. 135 and 136). Also of interest are the trials where the lens had been removed from the camera, but where recognizable images nevertheless appeared (Figs. 12a, 29, 88, and 94). Control pictures with the lensless camera were much more blurred (Figs. 13 and 30).

TARGET-RESPONSE RELATIONS

In most of the experiments, a picture of some building, scene, or object was designated as target. J.E. points out that if Ted could reproduce a randomly chosen target, this would greatly weaken any argument that he produced the images normally. Unfortunately, this aspect of the study has not received much attention. There was never, as far as I can determine, random selection of target pictures. It would have been a simple matter to provide a number of possible targets of the types preferred by Ted prior to each session and then select one at random. As it is, the choice was often left to the subjective preferences of the experimenters and it is conceivable that these might have corresponded normally to those of Ted, or that he might have inferred them. For instance, he might speculate that a radiologist would select something pertaining to his field such as a nuclear reactor plant, as in fact one did (p. 258 *fn.* and Figs. 130-132). It is doubtful whether such factors will account for all or many of the target-response correspondences. However, it is easy to provide randomly chosen targets and I hope this feature will be incorporated in future tests.

Another omission is the lack of a reliable judging method to decide whether or not a given response resembles its target (or to what extent it does). J.E. is impatient with the "all-spit-and-polish statistical approach" in parapsychology (p. 323). Whether or not some of this work lacks imagination, it has resulted in methods which could provide a firmer footing for venturesome projects such as his.

Several of the images have a "hidden picture" quality which sometimes makes it difficult for one person to recognize features which are obvious to someone else. For instance, the theme of Figs. 19, 21, and 96 is not, I think, a haphazard collection of legs, bicycle wheels, and wicker chair, as J.E. says, but a man on a pedicab. Even in the case of a straight target hit, such as the Westminster Abbey picture, the experimenters only recognized it when it was turned right side up (Fig. 10). In the same way as one may overlook similarities, it is possible to imagine correspondences which are not in fact there. For instance, with regard to an image shaped roughly like a pyramid (Fig. 88), Ted had the impression that its target was on page 89 of the target book. In fact, the book had no numbers, but on page 189 of the book used for a previous experiment, there was a picture of a pyramid which somewhat resembled the response image. However, close examination of Fig. 88 shows it to be a blurred image of a theme which appears clearly in Fig. 90, some buildings in St. Peter's

Square in Rome, which was obtained at the same session. The central structure casts a triangular shadow which, contrasted with the illuminated part of the building, produces an outline suggestive of a pyramid. The St. Peter's Square theme is particularly evident from the parallel and rectangular lines on the lower half of Fig. 88, resembling roads or walkways. An actual photograph (Fig. 91) reveals that this is exactly what they are.²

An examination of the seventy-eight ostensible psi images in the book shows that they concern fifty-one different themes. I have analyzed the fifty-one themes according to the target-response relationship. The targets for these themes can be divided into three groups: targets known to Ted before the session; targets known to him before the trial but not before the session; and targets that were unknown to him before the trial. In the case of sixteen themes, it is not stated whether or not there was a target. As a rule, there is a target in J.E.'s tests and I expect that in most, perhaps all, of these sixteen themes, there was a target which Ted's image failed to "hit."

Targets Known to Ted Before the Session

Seven targets were known or might have been known to Ted before the session. In all instances, his pictures seemed to bear some resemblance to them. The target chosen for the first experiment in Denver was a picture of Westminster Abbey (Fig. 9). Though Ted was only informed that this would be the target during the experiment itself, on the previous day he saw a picture of the Abbey and told J.E. that this was the kind of structure he could get. Perhaps, therefore, he suspected that it would be chosen. In any case, he obtained an ostensible psi image showing part of the building (Figs. 8 and 10). In six other experiments, the images showed structures which Ted had aimed for (Figs. 47-49 and 67), similar structures (117, 133, and 146), or structures which might correspond to his idea of the target (Figs. 112 and 147).

Targets Known to Ted Before the Trial but not Before the Session

In five cases, the target was revealed or chosen prior to the response but was not known to Ted before the session. Also in this category, all response images seem to match their targets.

After two rolls of unsuccessful prints in an experiment with a concealed target, the target was shown to Ted. The picture was

² Dr. Eisenbud, in a letter, supports his identification of the image with the Pyramid of Dahchour by the broken slope of the sides which are characteristic of this pyramid. What I call the walkways at the bottom of the print he suggests are displacements of similar structures above and to the left of the picture of the pyramid.

an Austrian church tower with a clock. Shortly afterward, an image appeared of a clock tower, apparently Big Ben (Fig. 12a). In another trial, Ted was asked to attempt a clearer image of a statue that appeared in a preceding experiment next to some columns. Instead, he got a different statue and column (Figs. 60 and 61). Similarly, when he had been asked to aim for an etching on the wall showing the buildings of a medieval town (Fig. 65), his response showed houses with walls and roofs similar to but not identical with those in the painting (Fig. 66). Another response of this type was obtained during an experiment with another building target. This was selected by Ted, who held a book upside down, flipped the pages, and asked a participant to indicate the stopping place. Ted briefly glanced at the picture which showed an Oriental building. After a few trials, he sketched on a piece of paper his memory of the building and then, shortly afterwards, produced four images which seemed to combine elements of the original structure with part of his drawing (Fig. 72).

In the fifth example, when J.E. asked him to reproduce a magazine photograph showing some Welsh houses, Ted came up with a "jumbled but definite correspondence" (p. 338, Fig. 150; the target picture is not reproduced in the book because J.E. could not get the magazine's permission).

Targets Unknown to Ted Before the Trial

There is one case with an obvious similarity between response and concealed target; in four instances there may be a correspondence; and in ten I was unable to find any, though J.E. asserts it is there. Finally, there are eight themes where no correspondences are claimed.

In an experiment where the target was chosen in a separate room from the one Ted occupied and kept in that room, Ted only knew that a building had been chosen. The target was the Hall of Mirrors at Versailles (Fig. 69). Ted first drew three sketches, two of which were of domed and pillared buildings. He then took a picture which showed a similar structure. The ceiling and end wall of the room in Versailles are domed and the spaces between the windows and the mirrors are decorated with pillar motifs. I expect that if this target and response had been incorporated in a batch of experimental material assessed by blind matching, they would have been matched.

There are four additional instances in which I agree with J.E. that there may be some relationship between response and target. An image of what appears to be a rocket or satellite (Fig. 82) does not seem to match the French chateau Maintenon, but the turrets

of the floodlit castle (Fig. 81) may, as J.E. says, be recognized in the shape of Ted's spacecraft.

Another possible correspondence between target and response was produced by an image apparently showing three officers reviewing military troops (Fig. 127). The target was a picture of isochromatic stress lines (Fig. 128) which to Ted suggested "eyes looking at a line of people" (p. 258). In an experiment in which the target was a drawing of a nuclear reactor plant (Fig. 130), the response showed a dome-shaped structure (Fig. 131). There was no reactor dome on the target building, but the person who chose it said he had been trying to find one with such a dome. In another experiment, only half of the target picture was hidden, the other was exposed to view. The exposed part shows a castle and the hidden part, a modern bridge at its foot (Fig. 142). The image (Fig. 143) shows a wall of bricks or stone which, though found on neither part of the target, tends more to resemble the concealed ramp leading to the bridge than anything on the castle.

In ten cases, it is difficult for me to see any correspondence between the response and the target, even taking a broad view of both situations. For instance, I found less similarity between the images of windmills (Figs. 24, 25, 26, 29, and 74) and the Piazzas San Marco in Venice (Fig. 73), the target for that experiment, than between windmills and the Kremlin building (Fig. 108), which was the target when Ted produced the Chicago Water Tower (Fig. 4, also a poor correspondence). Fig. 122, another attempt at the Venetian scene, also missed, in my opinion.

Of course, if the target situation is inflated to encompass pictures, say, from a whole archaeological period or from anywhere in the target book, similarities will inevitably be found (Figs. 62, 64, 88, 93, 96, and 99). They are not convincing, however, without predetermined rules as to what can count as targets and how their correspondences with the images are to be assessed.

In another case, J.E. suggests that an image of a column (Fig. 101) is a phallic symbol, not of the actual target, but of another picture in the target book (Fig. 100). Again I do not see the connection. However, J.E. candidly admits that others have failed to see correspondences that struck him.

In summary, I find it difficult to dismiss, either in terms of fraudulent preparation or of chance coincidence, the apparent target-response relations in the five cases where Ted was ignorant of the target prior to the session and in the five cases where he did not know it before the trial. I assume that with respect to the targets made known to him during the session, he could not normally have caused the selection of a target (say, by admiring the etching shown in Fig. 65 and in that way encouraging the

experimenters to select it). Due to the lack of rules for choosing targets, however, this possibility may not always have been ruled out. Another consequence of this informality is that we cannot tell whether the correspondences were due to ESP by the experimenters or by Ted. Perhaps the experimenters picked the targets according to their ESP perceptions of Ted's images before they appeared on the prints.

AWARENESS OF IMAGE THEME

As noted in the previous section, Ted rarely had sufficient control over his images to cause them to correspond with unknown targets. In several instances, however, he appeared to be aware of the effects before they materialized. In the sessions with the A.P.A. committee, where whities were obtained with a taped lens, he often had the impression that an image had been obtained when these effects occurred. J.E. says that for about eighty per cent of the whities, Ted was convinced of success. He rarely predicted a positive result on a trial that produced none (pp. 86-87). This series of tests also exemplified a striking lack of awareness on the part of Ted. I refer to the eight shots taken of him after he had collapsed on the floor and presumably had passed out, which were all whities (of course, these can only be accepted if control pictures, taken under the same conditions, showed nothing unusual). In addition, there were several instances where Ted seemed aware before a trial or else immediately afterwards, but prior to the development of the print, that a given image would appear. For instance, before he got an image of a tall building with windows having a cross-like shape (Figs. 4 and 106), he predicted that he would get a long, tall structure with "a sign crosswise on it" (p. 23). (J.E. finds a special significance in the cross effect. However, it appears from the normal photograph of this building (Fig. 107) that there are protrusions which would produce cross-like shadows when hit by the sun.) In another case, shortly after the concealed target had been taken out and was shown to be a church tower with a clock (Fig. 12b), Ted triggered the camera and exclaimed, "It's a clock, a clock" (p. 80). The picture was the one of Big Ben (Fig. 12a) mentioned before. Other themes he seemed aware of are illustrated by Figs. 27, 66, 93, 96, and 141.

Such awareness, of course, is not in itself an indication of paranormality. If Ted had prepared himself fraudulently for the sessions, we should expect him to know which images would appear.

ESP ABILITIES

There are some interesting cases where, though Ted failed to show the concealed target on his print, he guessed it, perhaps by ESP. For instance, at the end of the A.P.A. session, Ted was asked what one of the sealed target envelopes contained and he correctly identified it as the Eiffel Tower (see pp. 164-165, where this and two similar examples are given). In a case where the target was a close-up of the stones of one of the Pyramids (Fig. 84), Ted asked if the target were not some sort of cobblestones. In another instance he thought that the target, a French chateau, was "something somewhere in France" (p. 180). Another time, he felt that there was "a driveway, entrance, or a walkway" (p. 205) when the target showed an entrance to a building in the Kremlin (Fig. 108). It is, of course, easy to find correspondences which may not be there. The United Airliner shown in Fig. 80 does not, at least to me, look like the giraffe which Ted thought it might be. I think J.E. stretches the point further when he finds an additional correspondence in the fact that on the same page from which this picture was cut, there is an advertisement for Air France which has some of the same letters as in "giraffe."

THE ESP PROJECTION THEORY

In attempting to explain the images, J.E. makes the interesting suggestion that they may be the results of out-of-the-body experiences by Ted. J.E. claims that Ted's pictures of two of the structures, Westminster Abbey (Figs. 8 and 10) and the Denver Hilton Hotel (Fig. 117), are taken from positions above ground level which would entail scaffolding or something comparable to bring the camera into the air. Such images would be consistent with a theory that the disembodied personality of Ted obtains its impressions from above treetop or building level.

It may help answer the question of how Ted obtains his pictures by examining the structures more closely for clues indicating the places and times they were photographed. If there is a tendency for the pictures to be taken from above ground level, this would support J.E.'s hypothesis. The illumination of the structures might indicate whether or not the pictures were taken at the time of the session.

Viewing Perspective of Structures

I have made a comparative study of the fifty-one themes according to whether the structure appears to be viewed from above, below, or from the side. If we assume that by chance com-

cidence there should be about an equal number of themes in the three categories, a comparison might be informative. In six cases the scene is viewed from above, in eleven from below, in twenty-four from the side, while in ten cases it was not possible to determine the point of view. The difference between the number of images seen from above and below is not statistically significant, but the number of themes in the "above" category contrasted with those viewed from the side is highly significant ($X^2 = 10.8$; $p < .001$).

It is possible that for some of the structures which were seen from the side or below, such as Westminster Abbey and the Denver Hilton Hotel, there was no physical structure to support a camera. On the other hand, some of the scenes taken from above might have been shot from neighboring buildings or comparable locations. The general impression is that the photographs were taken from physical vantage points rather than from above treetop or building level.

Times of Photographs

The pictures may contain clues as to when they were obtained and whether this time coincided with the time of the experiment. In two instances, the structure either did not exist at the time of the session or a detail shown was not in existence then. The Stevens Hotel in Chicago (Fig. 6) had burned down some years before the session and a poster which appeared on a picture from Central City in Colorado (Fig. 67) evidently was not on the building at the time of the session.

The exact times for the trials generally are not given; however, it is often stated that they were conducted in the evening. Since there is no reference to daytime tests, I have assumed they were all done at night.

In many of the prints produced by Ted, including many of the apparently "underexposed" ones, the shadows and the nature of the illumination suggest that the images were obtained in daylight, often sunlight. Of the fifty-one themes, thirty are this type. None of the structures appear to be artificially illuminated. There are twenty-one where the source of the illumination cannot be determined and it is possible that some of them were shot at night.

Since it is daytime in some parts of the world when it is night in others, this factor must be taken into consideration. In the case of six of the seven themes (Figs. 4, 6, 37, 67, 117, 125, 146) which suggest a North American origin, the pictures seem to have been taken in the day. These photographs, it appears, could not have been obtained during the sessions nor during nocturnal ESP excursions prior to them.

Most of the other identifiable structures are European. There is an eight-hour difference between Rome and Denver. If the experiment was run between 8 and 12 P.M., it would have been between 4 and 8 A.M. in Rome. For images taken close to midnight during sessions in the summer it is possible that it was late enough in the morning in the European locations to provide the illumination seen on the photographs. This question can only be answered decisively by ascertaining the dates and hours the images were obtained.

The preference for daylight scenes, whether or not it was day at the location in question during the session in Denver, is inconsistent with the theory that the scenes were perceived by ESP when the images were produced. One other aspect of the photographs indicates that Ted was not responding to an existing contemporary situation. As J.E. points out in the case of repeated shots of scenes with persons, some movement would be expected if Ted were monitoring the scene by ESP. The two persons in Fig. 22 "never took a step forward despite our entreaties" (p. 116). Similarly, there is no change in the position of the legs of the man on the pedicab between Figs. 19, 21, and 96. J.E. says that in another picture (Figs. 27 and 28), there is a change in the position of a seated person. However, the picture where this change is said to occur is too blurred for me to see it. On the other hand, an ocean liner gives the impression of having moved from Fig. 47, where it is pointed slightly toward the viewer, to Fig. 49, where it seems to be alongside. In general, however, there is no suggestion of movement. When the images differ, as in the case of the windmill photographs (Figs. 24, 25, 26, 29, and 74), as a rule it appears that the position of the camera was at various distances and angles from the object, but that the latter itself remained the same (there is no change in the position of the windmill blades).

It seems to me that the data do not support the ESP projection theory nor any other view according to which the sources of the images are the structures themselves, cognized by ESP. The prevalence of daylight scenes, of pictures taken from ground level and the other features to which I have referred, point to another explanation; namely, that the pictures originated from photographs of the structures and not directly from the structures themselves. There is additional support for this view. J.E. says that although he has never found exact copies in magazines or books of the images that were produced during his experiments, Mrs. Oehler (5), in the sessions she conducted with Ted, has several examples. With regard to these, J.E. suggests that "... one would almost have to assume that what Ted was imaging *was* these pictures, or an exact counterpart of them in someone's mind at some time

or other . . . and not, in any easily imaginable sense, the same scene 'shot' by himself from an identical angle and under identical lighting conditions" (pp. 225-226). A simpler hypothesis, which does not require ESP on Ted's part, is that Ted himself at some time had seen the pictures and that the images represent his, usually "forgotten," memories. This theory is suggested by an image which is not reproduced in the book, though the session is described. As J.E. reports in a paper in this *Journal* (2), Ted drew his attention to the fact that a spider-like structure was part of a picture of an old staggerwing airplane in a book of which he, Ted, had discovered he had a copy. Another significant aspect of this image is that the target from one of the six participants, each of whom submitted a written target unknown to Ted, was "Staggerwing airplane" (no particular model was indicated). This correspondence cannot easily be explained away even though the person happened to own and pilot a plane and even though one of Ted's hobbies concerns old planes. (But, as in other cases where the target choice is made by the experimenter, the ESP could have been exercised by him rather than by Ted.) If the other images are also derived from photographs reproduced in books and similar sources, perhaps additional pictures will be identified.

If Ted's pictures represent his memory images, these are surprisingly free from the distortions to which people's memories are often prone. It is particularly noteworthy that Ted's needs and aversions, which he expresses more overtly than most people, apparently do not color his images. If the photographs of the churches and historical places that are seen in Ted's pictures are manifestations of his thoughts, Ted's mind is much more photographic than one might suspect from its other expressions.

PHYSICAL ASPECTS

The Upside Down Effect

If Ted's phenomena are genuine, they will have implications for a number of areas in parapsychology, particularly those that deal with images in one form or another, such as ESP dreams and ostensible apparitional and materialization phenomena. They would, of course, also be relevant to studies of ordinary mental images and hallucinations.

Mental images and especially hallucinations, including parapsychological ones, usually are seen in an appropriate relation to physical space insofar as they are likely to be right side up. Hallucinations of people, including ghosts, do not commonly walk on the ceiling. Similarly, the memory images some people see when their eyes are closed tend to be right side up in relation

to the perceiver. If the images reproduced by Ted conform with this pattern, they too should be right side up.

In most of the seventy-eight pictures, it is not possible to determine the position of the images. In several instances, however, the experimenters placed an arrow on the border of the print to show the direction it was pulled from the camera. On the Polaroid 95, seen in Fig. 17 in its vertical position, the pictures are removed from the bottom. If the camera is held horizontally, the prints are taken from the right. This is also true for other Polaroid models. For all the images shown in the book, the camera was supposedly held horizontally (p. 112). If a normal picture is shot with this camera held horizontally, the arrow should point right. Of course, the right side of the camera, as it is operated by the person who triggers it, is to the left of the person being photographed. Since his image is turned upside down by the camera lens, the arrow should point right when the picture is printed in a normal position in the book. The arrow on Fig. 50, which is a miss showing Ted's face, points right, which is as we should expect on a normal picture.

Of the seventy-eight images in the book, thirty have pull arrows and are also clear enough for us to determine which side of the image, usually a building, should be up. Of these thirty prints, in seventeen, the structure appears to have been photographed with the camera in a more or less horizontal position (and the rectangular print is consequently placed lengthwise in the book). In thirteen it is vertical or approximately so (and is reproduced vertically). Of the seventeen horizontal prints, in five the arrow points right and in twelve, left. In other words, in twelve of the seventeen cases the images in front of the camera were upside down and in five, right side up. With regard to the vertical prints, neither end of the image is "right side up" since the camera was held horizontally when the picture was taken. In eight cases, the arrow points up, which means that the top of the image was located to the right of Ted and in five it points down, meaning that the top of the image was to his left.

With regard to the horizontal images, though there were more than twice as many upside down than right side up images, the difference is not statistically significant. There is, however, a trend and it would be interesting to know whether or not this holds up on the prints that are not published in the book. If it does, it represents a curious contrast to the more familiar images known to psychology and parapsychology.

Distance and Physical Energies

Several attempts have been made to increase the distance between Ted and the camera. Some involved mirrors and TV cameras to

simulate proximity between Ted and the person holding the camera. Except for the series of blackies already referred to, when the camera was thirty feet away from Ted, the distance tests did not succeed.

Tests in a Faraday cage, in a whole-body radiation counting chamber, and in lead-lined rooms, showed no indication that the images were associated with electromagnetic radiation outside the visible spectrum. In these sessions, and most of the others where images were produced, there was, however, no obstruction of visible light between the camera and Ted's body. He could get images through half an inch of lead-impregnated glass, but, as mentioned before, opaque lead sheets, 1/64 inches thick, inside the camera, seemed to block the pictures.

J.E. is surprised that lead-impregnated glass could be penetrated, but not lead sheeting and suggests that Ted's unconscious or the experimenters, may play the role of a "Sorcerer's Apprentice" which interferes with the results (pp. 274ff). It seems to me that the data indicate a simpler hypothesis; namely, that the energy source is ordinary visible light. This theory is supported also by the following observations.

The Gismo Shadow

Several of Ted's images are framed by a dark ellipsoidal shape which evidently is produced by the gismo. At least I assume that it is, because the shadow also appears on images which are not claimed to be paranormal (Figs. 14, 15, 32, and 50). This ellipsoidal bordering can be seen clearly in ten of the seventy-eight images showing structures. In an additional eleven cases, only part of it can be seen in the form of a dark curving shadow (in one instance, Fig. 5, the image is outside the curve). In a few, the border is formed by linear or rectangular shapes which could have been produced by a gismo pressed out of shape. In other cases, the image reaches the frames of the print, probably because a gismo with a large diameter which did not interfere with the image was used. Fig. 42, a miss which only shows the face of Ted, has no gismo shadow though a gismo presumably was used.

The finding that a paper tube can interfere with the images supports the theory suggested by the trials with lead sheets that the energy that affects the film is light in the visible spectrum. This theory is also indicated by the observation that a lens covered with one layer of masking tape, which is translucent but not transparent, evidently prevented the formation of images, only allowing for whities.

THE GIMMICK THEORY

Since cameras and films were provided by J.E. and other observers and were generally under their control, attempts to provide a normal explanation have centered on the gismo, which as a rule is handled by Ted. The fact that the gismo was subject to inspection between shots and that others, made by the investigators, could be substituted for it, strongly suggests that the gismo was the innocuous tube of paper or cardboard it seemed to be. This does not rule out the possibility that it was used to hide something which Ted removed when the gismo was shown around.

The possibility that the gismo contained a fraudulent device which projected the images was considered by J.E. and, undoubtedly, by all the others who have watched Ted at work. J.E. points out that pictures can be produced by means of an extra lens in front of a transparency or print. But, he says, "... although getting an image on film with a system of this sort can obviously be managed, no one has suggested that it can be done in a rapid sleight-of-hand way that could pass detection under close scrutiny, no matter how minute the props" (p. 107).

The theory that the gismo is used to camouflage a projective device has been advanced by C. Reynolds and D. B. Eisendrath, Jr. in *Popular Photography* (6).³ These writers are professional photographers and also, according to a short sketch accompanying their articles, skilled magicians. They spent a weekend with J.E. and Ted in Denver. Unfortunately, Ted produced no effects. The authors are skeptical of the phenomena and though they do not outright accuse Ted of fraud, it is clear they believe that is how he produces his effects. They support this by showing how images similar to those Ted produced can be created if a "gimmick" is placed inside the gismo when the camera is triggered. The gimmicks they used were simple devices consisting of a tube with a lens at one end and a photographic transparency at the other. The tiny viewers with "girlic" pictures and the like which are sold in novelty shops can be used. To obtain an image, the lens of this device is held toward the camera and the transparency away from it. Light is either provided by the Polaroid wink light, reflected from the face or clothing of the person who holds the gimmick, or by other sources of illumination in the room. A special point is made of the fact that the discontinued Polaroid 95 Model, which is preferred by Ted, has a smaller lens opening than those now made and can more easily be covered with a gismo, thus eliminating extraneous light. Moreover, the cameras used by

³ See also Dr. Eisenbud's reply (1).

Ted are always set at infinity which, as Eisendrath points out, is the most suitable setting for a sharp image with a gimmick.

Two questions need to be answered: can the kinds of images Ted obtains be produced by a gimmick? If they can, is there evidence that they were or could have been produced that way?

Gimmick Theory and Characteristics of Images

Structures: The analyses of the images discussed before which suggest that the structures were usually photographed from physical vantage points taken in daylight are consistent with any theory, including the gimmick theory, which postulates that the photographs originated from conventional sources. J.E.'s discoveries that lead sheets placed inside the camera in front of the print block the effects and that a taped camera lens prevents images from forming also fit the gimmick theory. Similarly, the presence of the gismo shadow is to be expected if we are dealing with an ordinary light source.

The upside down effect, if it is not due to chance coincidence, could be expected from a gimmick, which is usually held the same way. This is not likely to be the case with cylindrical gimmicks, but might be the case with rectangular or odd-shaped ones such as converted novelty viewers. If Ted tended to insert the transparency into the gimmick in the same way before the sessions and if he tended to hold the gimmick upside down in relation to the inserted transparency when he shot a picture, the images projected by the gimmick would be upside down and would account for the preponderance of prints with the pull arrows pointing left.

Needless to say, these findings may also be consistent with parapsychological theories. For instance, the preponderance of pictures shot from physical vantage points during the day fits the hypothesis that the actual targets are published photographs cognized by ESP.

Images with Lensless Camera: Several of Ted's pictures were shot with cameras from which the lens had been removed. Control pictures taken with the lensless camera were extremely blurred. However, Reynolds and Eisendrath were able to take recognizable pictures on a lensless camera using a gimmick (6). Though these were much clearer than J.E.'s controls with the lensless camera, they were not as clear as the pictures produced by Reynolds and Eisendrath with the gimmick using a camera with a lens. This, of course, is to be expected.

According to the gimmick theory, a transparency reproduced with a lensless camera, though recognizable, should not be as clear as the same transparency shot with a camera with a lens.

In the case of three themes illustrated by J.E., the pictures taken with the lensless camera (Figs. 29, 88, and 94) are in fact more blurred than the same themes taken with a camera with a lens (Figs. 24, 90, and 93). Note, however, that although the building in Fig. 88 is so blurred that it was mistaken for a pyramid, the walkways at the bottom of the print are in quite sharp focus.

Image-Face Combinations: According to the diagram in the article by Reynolds and Eisendrath (6, p. 84), the transparency image is inverted by the gimmick and again by the camera lens. Mr. Leonard F. Barcus, an optical engineer in New Rochelle, New York, who kindly read my manuscript, criticized the sections that were based on this assumption. He informed me that a gimmick with a simple lens, such as those found in novelty viewers, would not cause a second inversion. His comments stimulated me to test this and other points experimentally. Using two kinds of novelty viewers and various homemade gimmicks, I had no problem producing images as well as whities and blackies. Mr. Barcus' statement about the absence of inversion was verified, as well as his remarks on my original observations about the lamp-image combination, which I consequently amended (see the next section).

In the course of the tests I discovered that when the gimmick only partially covers the camera lens, the transparency image may take up the entire print with the normal background at which the camera is directed showing through the image. The effect is similar to Fig. 41, where Ted's face is seen in the midst of an unexplained structure. If the gimmick is tilted or moved toward the rim of the camera lens, the transparency image will no longer overlap with the background, but each appears separately as in Figs. 36 and 38, where parts of Ted's face and unexplained structures occupy distinct parts of the prints.

The Polaroid cameras and gimmick lenses for these trials were supplied by Dr. W. T. Joines, Department of Electrical Engineering, Duke University. He and Dr. J. L. Artley, of the same department, also collaborated in some of the experiments.

Lamp-Image Combination: The gimmick theory could also account for Fig. 33, where an unknown structure appeared together with an image of a lamp at which Ted had pointed the camera. J. E. points out that since the camera was set at infinity, the lamp should have been blurred and not in sharp focus as it was in Ted's picture. However, a gimmick covering part of the camera lens would have the effect of reducing its aperture, thereby increasing the depth of field and giving a sharper image of objects in the room close to the camera. J. E. also notes that the lamp

should have caused an overexposure. A gimmick would reduce the amount of light reaching the film.

Gimmick Theory and Experimental Conditions

It is not enough for proponents of the gimmick theory to show that the images are consistent with it. It must also be shown that the conditions of observation allow for trickery without detection.

On one occasion, J.E. caught Ted surreptitiously triggering the camera as he passed in front of a lamp (pp. 137-138). J.E. immediately took the camera from him, pulled the print, and threw it away without developing it. If Ted had not been observed, the implication is that he might later have requested that a picture be taken with that camera, have asked someone to hold their palm over the gismo, and then produced an image of the room under apparently impossible conditions. At other times, J.E. indicates that fraud was possible though not actually observed (pp. 134-145). Pictures of objects or persons in the room which were reproduced when Ted had asked someone to hold his hand over the lens or the gismo, were therefore rejected as evidence because he or someone else might have taken the pictures unobserved beforehand. J.E. only discards pictures obtained in this way which were "in principle, reproducible" (p. 141). If an image appeared of a structure which was not in the room, it evidently was accepted. However, it seems to me that the obstructed lens method could also be used in conjunction with a gimmick. If Ted had such a device, he might, at an opportune moment, use it on a camera. Afterward, he would ask one of the participants to hold his hand over the gismo. The print produced would show the gimmick image. This theory only applies to those sessions where Ted could move about freely, pick up cameras, etc. For instance, the lens was blocked at Ted's request for one trial where a double-decker bus (Fig. 11) appeared. We are not informed of Ted's movements prior to this shot. If he was not supervised before the trials where the lens was or could have been covered, perhaps the gimmick theory should be considered for those images.

As J.E. notes (p. 87), it is not uncommon for some mediums and sensitives to resort to trickery when their psychical abilities fail. To paraphrase R. H. Thouless (7, p. 69), the question is not whether Ted ever cheated, but whether he ever produced images of structures or other effects under conditions where he was so well controlled that cheating was impossible.

Each experimental situation must be appraised on its own merits, or rather, each trial should be appraised separately.

The gimmick theory does not apply to the whities obtained with the A.P.A. group. Since randomized control pictures, presumably

taken under identical physical conditions, showed nothing, these effects appear to be paranormal. Most of the other experiments are not reported in sufficient detail to provide a basis for a sound opinion. However, the case referred to earlier where Ted was fifteen feet from the camera, and the shots that were taken when the experimenters were in charge of the camera and gismo and presumably would have detected attempts to insert anything into the gismo or to cover it, cannot, it seems, be explained by the gimmick theory.

CONCLUDING REMARKS

The story about Ted Serios is one of the most interesting and dramatic accounts to appear in parapsychological literature for many years. As is to be expected from a popular presentation, the book raises as many questions as it answers. Dr. Eisenbud has already begun to fill in the details in the pages of this *Journal* (2). Descriptions of Mr. Serios' and the participants' positions, diagrams of the rooms, and the conditions for each shot (see especially p. 246) are the types of presentations that are needed. The reader is advised to study that article and to judge for himself whether any ordinary explanation can account for the phenomena.

As additional studies of old as well as new effects produced by Mr. Serios are made, I hope they will be supplemented by analyses of the images themselves for clues about their nature. Perhaps the analyses offered in this survey will provide suggestions for more exhaustive and informative ones.

On the basis of the present material it appears that the sources of the images, as a rule, are normal photographs taken in daylight from ground level or other existing vantage points. The reception end of the process is also, I think, to be explained in terms of familiar physical and photographic processes. Dr. Eisenbud ruled out energies in the invisible electromagnetic spectrum by his experiments with Faraday cages and lead-lined rooms. But when opaque lead sheets were used which obstructed rays in the visible spectrum, the effects were blocked. Similarly, the edge of the gismo seemed to interfere with the images and none appeared if the lens was covered by masking tape.

The only aspect of the process that remains unknown, it seems to me, is how the image was transmitted from its place in a book or magazine to the front of the camera lens. Reynolds and Eisenbud are convinced they have the answer. I find it difficult to believe that so many observers could have been tricked for such a long time. In particular, I find it difficult to believe that Dr. Eisenbud, who has had Mr. Serios under survey for more than

216 *Journal of the American Society for Psychical Research*

two years, has been fooled by simple sleight-of-hand. But as Dr. Eisenbud points out, the only way to provide definitive answers is to draw in additional subjects and investigators and to see if results continue to come in.

The most meticulous piece of research will be thrown aside if its findings are not confirmed, while a less perfect work may receive a permanent place in science if its findings are confirmed and lead to new knowledge. Whatever the final verdict will be, Dr. Eisenbud's work has already had the good effect of challenging other scientists to conduct independent investigations of Mr. Series.

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