

Letters

A Pseudo Experience in Parapsychology

The popular literature of parapsychology abounds in stories of the following kind: A person is dreaming of a friend he hasn't seen or thought of in 30 years. He is awakened by a call from a telegraph operator, telling him of the death of that friend several thousand miles away. Most scientists attribute such pairs of events to pure coincidence, but they offer no comparable stories to show that such apparently improbable coincidences do in fact occur. In the absence of such demonstrations, it is not surprising that the general public feels that there must be a causal relation between the two events, as, for example, by thought transference.

On 16 May 1965, reading the San Francisco *Sunday Chronicle* I noticed an article on page 22 entitled "Ancient men on the Nile." In scanning this story, I saw the phrase "... the expert appraisal of Philadelphia anthropologist Dr. Carleton S. Coon." To anyone who had been an undergraduate student at the University of Chicago in the early 1930's, this unusual name would call up nostalgic memories of another Carleton Coon and his partner, Joe Sanders, whose popular Coon-Sanders dance band was then playing at the Blackhawk. So I found myself thinking about Joe Sanders, very probably for the first time in 30 years.

Less than five minutes later, having turned the pages of the paper to page 33, I saw an obituary notice headed "Joe Sanders." It read, "... died Friday. ... with the late Carleton Coon ... organized the Coon-Sanders band." These two closely spaced recollections of a person forgotten for 30 years, with the second event involving a death notice, is in the classical pattern; but it is obvious that no causal relationship could have existed between the two events.

The probability of a coincidental recollection of a known person in a 5-minute period just before learning of

that person's death can easily be calculated, to within a factor of 10. Let us take a 30-year period, and assume that an average person would recognize the names of 3000 different people who might die in that period of time (3000 is taken as a geometrical mean of 10^3 and 10^4 , the probable extremes of a population of "known persons"). We assume that our subject will learn of the death of each of these persons at some time in the 30 years. If we restrict our attention to the time when our subject learns of the death of a particular person, we can then ask how probable it is, that in the 5 minutes just preceding that exact time of learning of the death, an unrelated recollection that is unique to the 30-year period will occur. This probability, to within a factor of 2, is the ratio of a 5-minute interval to a 30-year interval, or 3×10^{-7} . (It is clear that if one thinks of the particular person once a year rather than once every 30 years, the probability will rise by a factor of 30, to about 10^{-5} .) The probability that one will have such an experience when learning of the death of any one of the 3000 recognizable persons is clearly 10^{-3} in a 30-year period, or approximately 3×10^{-5} per year. If we take the sample of 10^8 adults in the United States, 3×10^3 experiences of the sort related above should occur per year, or about 10 per day. (For the average person 3000 recognizable names is probably an overestimate, but the postulated single recollection in 30 years is certainly much too low. These two departures from realistic assumptions have opposite effects on the computed rate, so 10 per day is still a reasonable estimate.) With such a large sample to draw from, it is not surprising that some exceedingly astonishing coincidences are reported in the parapsychological literature as proof of extrasensory perception in one form or another.

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Elinor Langer's lucid report "National teach-in: Professors, debating Viet-Nam . . ." (21 May, p. 1075) incites the following comments:

1) The "academic dissenters" should have recognized that a political administration cannot afford to enter into direct debate with any portion of the electorate, however high-minded, except as the forms and uses of government provide for debate—for instance, within the legislature or at specified times immediately preceding election. Any administration whose executive branch allows itself the luxury of direct debate outside of such constitutional and customary forms is inviting its own fragmentation and the dissolution of the two-party system. Therefore, to ask, to demand, that an administration do so is politically irrational.

2) Bundy, or the administration, should of course have recognized this fact, ignored the provocation to direct debate, and kept his literate mouth shut. The quotations from his letters to the professors seem to show that his failure to deflect the challenge (not the arguments, which should be freely made and freely heard) from the executive to the legislative branch and to the forum of public opinion was the result of a fatigue psychosis with its usual holier-than-thou attitude. Pressed by unbelievers, Bundy couldn't resist playing God.

3) In short, both academia and government lost their heads, which isn't surprising. Indeed, the republic has survived hysterical escalations of this kind since it began. But now we have The Button. If both these heads be lost, under whose finger, moved by what head, lies that Button, and the power to write "Mene, mene, tekel, upharsin"?

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Recording Lissajous Figures

The graphical recording of Lissajous figures by mechanical means demonstrates the motion of a double pendulum. Wayne B. Hales reported on one such graphical method [*J. Acoust. Soc. Am.* **16**, 137 (1945)], and the beauty and design of his figures have inspired me to produce similar figures by a relatively new technique. I used an IBM 7044 computer and a Stromberg-Carl-

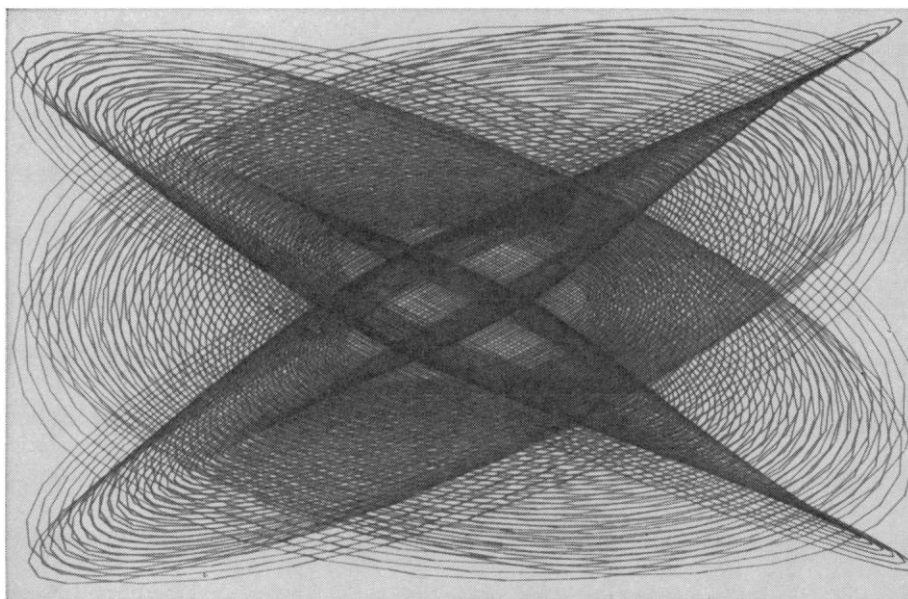


Fig. 1. A Lissajous figure produced by computer. The input data were $T_1 = 3.04$, $T = 3.65$, $\alpha = .7854$, $a = .900$, $b = .600$, $\delta t = .100$, total time = 912.0, and $\psi = 1.40 \times 10^{-3}$. Another example appears on the cover.

son 4020 printer-plotter. The 4020 is a device programmed to draw straight lines from one point to another on the face of a cathode-ray tube; it then photographs the output. The starting-point and end-point data of each line segment are fed into the 4020 on a magnetic tape produced by the 7044 from a program written in Fortran IV.

The equations describing the path of a particle undergoing the motion of a damped double pendulum are

$$x = ae^{-\psi t} \sin \left\{ \left[\left(\frac{2\pi}{T_1} \right)^2 - \psi^2 \right]^{\frac{1}{2}} t + \alpha \right\}$$

$$y = be^{-\psi t} \sin \left\{ \left[\left(\frac{2\pi}{T} \right)^2 - \psi^2 \right]^{\frac{1}{2}} t \right\}$$

where $\psi = \mu/2m$, μ is the coefficient of air friction, m the mass of the pendulum bob, α the phase angle, a and b the amplitudes, and

$$T_1 = 2\pi(l/g)^{\frac{1}{2}}$$

and

$$T = 2\pi(L/g)^{\frac{1}{2}}$$

are the fundamental periods.

Inputs to the program consist of T_1 , T , α , a , b , δt , total time, and ψ ; δt is the interval at which points (x, y) are calculated. The time t is initially set to zero, then increased by δt , until the time exceeds total time. Input values were chosen with Hales's figures as a guide.

The results compare well with those previously reported, although the pic-

tures are not as esthetically pleasing because of the necessity of approximating a curve by drawing straight-line segments from point to point (Fig. 1). Smoother results could be obtained by choosing a smaller time increment, but this would increase the computing time and the expense. The total time required to produce a completed picture is about one minute.

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Conference Literature: Rebuttal

I take strong exception to the views of E. H. Ahrens, editor of the *Journal of Lipid Research* (16 Apr., p. 313), when he praises *Biological Abstracts* for its decision not to abstract (or even list and index by title) individual papers from "conference literature." Perhaps this term suggests the 10-minute papers presented by beginning investigators, but in actual fact it refers to substantial papers presented by distinguished, hand-picked, senior investigators at major conferences and symposiums.

Abstracts of these important papers have two purposes: (i) They call attention to work in progress, even if it is in preliminary form and not accompanied by experimental detail. (Unfortunately the lag in publishing abstracts detracts from this function.) (ii) They are a tool for retrospective

searches. Scientists seldom use abstracts to find out what is happening in their own field of specialization, but when they are preparing bibliographies or looking for reviews in a peripheral field, abstracts serve a valuable function. For these needs, conference literature is probably the most useful type of published work. It summarizes and reviews results scattered in different journals over a period of years. It describes the most recent and significant findings as well as work in progress. It presents views, perspectives, and interpretations which often will not pass the severe restrictions imposed on regular journal articles by limited space and conservative editorial policy. Apparently the value of conference literature to those who use abstracts is not fully appreciated by the editors and advisers of primary journals and hard-pressed abstracting services.

A major error in Ahrens position is his "main objection" that "the individual contributions are seldom subjected to critical review" and that "there is no check whatever on [the] scientific quality [of the work]." Has it been overlooked that these papers are presented to the most critical peer group possible—a group whose collective impression will determine the professional future of the speaker? Could one or more isolated referees be more critical than a roomful of scientists, many of them working in the same field, who are ready to catch the speaker on the slightest error in his procedure or conclusions? What scientist would dare to present results or speculation in such circumstances without adequate experimental data and without the most careful, critical self-appraisal?

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"America" Defined

At the turn of the century, as I collected iguanas in the shadow of the active volcano Colima, an Indian told me that I was not an American but he was.

Science (7 May, p. 787) repeats the claim of the University of Pennsylvania that its medical school, "founded a decade before the Revolutionary War, ranks as America's oldest school of medicine." In fact, the Medical School at San Marcos University, Lima, Peru, antedates the one in Philadel-