precede the spring meetings of the American Association of Petroleum Geologists. The GSA and the AAPG are the two largest societies of geologists, and many of the smaller geological organizations meet concurrently with these two groups.

In addition to short courses, a series of review articles is under development each of which will, in a few pages, outline basic theory, detail new developments, and cite the most important references on various specific geologic topics. This series will appear in the *Journal of Geological Education.*

Information about other programs being developed by AGI can be found in an editorial in the September 1965 *Geotimes.*

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More on Extrasensory Induction of Brain Waves

Science has published a number of articles that were highly critical of ESP research in the past. I am therefore rather surprised at the publication of Duane and Behrendt's report, "Extrasensory electroencephalographic induction between identical twins" (15 Oct., p. 367). The research described by Duane and Behrendt fails to meet some elementary criteria for parapsychological research, and I am certain that the report would have been rejected on first reading by all of the four reputable parapsychological journals (*1*).

The reported experiment has three major flaws. First, with only a single wall and 6 meters of space separating the subjects, the "receiving" twin may have been responding (subliminally?) to the experimenter's voice as he instructed the "sending" twin to open and close his eyes. Second, "gross inspection" as a means of scoring data in such a controversial area is obviously unacceptable. Third, the authors do not report even the most basic sort of descriptive data, such as number of trials under various conditions, much less any objective, statistical tests of their results.

Duane and Behrendt note that they will not draw any conclusions "because of the paucity of controlled data, contrasted with the voluminous controversial information available on the subject of extrasensory perception." The authors have not added further *controversial* data with such an inadequately controlled study, and they overlook the existence of a number of well-controlled studies of psychophysiological responses to ESP (*2*).

Speaking as a psychologist who is familiar with the reputable ESP literature and who has done some minor studies in the field, I feel the readers of *Science* should realize that Duane and Behrendt's report is below the usual standards for ESP research . . . and should not be taken as at all representative.

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. . . One unfortunate consequence of the publication by *Science* of Duane and Behrendt's report is its being selected for emphasis in popularizations of current scientific papers. I heard one science report on a major network radio broadcast in which this paper was singled out, as well it might be. The nonscientific public seems to be constantly on the lookout for evidence that nonphysical forces pervade and influence events. Such reports are eagerly received and their content exaggerated.

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A few additional facts about our experiment are hereby provided in answer to questions raised by a number of readers (Letters, 3 Dec.).

The twins were not in shielded rooms; conceivably they could have sent coded signals to one another. Neither they nor our technicians knew what we were testing. Induction, when present, occurred in both directions. Irregular eye-opening and -closing periods of 5 to 30 seconds were established on command. The command was either a whisper or a tap on the shoulder. The subjects were closely monitored to insure that they were following instructions. The event marker (in the later experiments) was inaudible. In the successful twins transmission seemed to occur always. The first set of twins was tested on only one day, because immediately thereafter

one twin became unavailable. The second set was tested on five different occasions for a total of approximately 45 minutes. Some of the records (not all) were read by one of us without prior knowledge of the conditions under which they were obtained. These statements do not answer all possible questions which could be raised, nor do they alter the reliability or the validity of the original report. In retrospect, the biggest defect in our experimental procedure was that we did not rule out completely conventional forms of communication between the twins, and we did not perform a statistical analysis to eliminate spontaneous alpha rhythms.

Our previous research led us to the proposal of an interesting hypothesis. Preliminary experimentation has indicated that we may be on the right track. There are roughly 1 million identical twins in the U.S. At least several thousand devices capable of recording electroencephalographic waves are located in various laboratories and hospitals throughout the nation. Obviously the opportunity to test, repeat, and extend this experiment exists in all corners of the land. Only hard, quantitatively acceptable results will prove or refute the hypothesis. We intend to seek such data, and it is our hope that others will do likewise.

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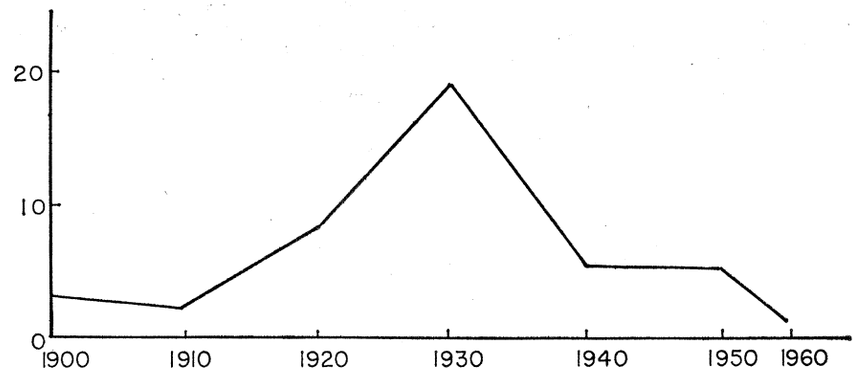

Fig. 1. Number of hit songs published in each decade since 1900 in the titles of which the word "moon" appears. Data from *Science* **150**, 594 (1965).

Parlor Game and Boop-Boop-a-Doop

Abelson's editorial "After the manned lunar landing?" (29 Oct., p. 557) contains interesting but irrelevant remarks concerning his favorite whipping boy, the space program, and in particular the manned space program. "If the John Glenn mission were repeated today, how much attention would it receive?" he writes. Such a question defies rational analysis. One could well make an interesting parlor game of it by seeing who can think of the best substitution for "John Glenn mission" (for instance "Charles Lindbergh flight," "Christopher Columbus voyages," "Galilean telescope invention").

Abelson argues that the NASA program is built around "a continuing series of spectaculars" which he thinks cannot be sustained in future efforts. This argument represents, I believe, a confusion of orderly progress with high drama. If a man of Abelson's experience and attitude still finds continuing drama in a long and fairly obvious progression of space flight tests, then why should not the average citizen? The manned exploration of Mars will be even more arduous, but the systematic exploitation of space technology leading to the exploration of that planet will contain the same seeds of drama as the simpler task of a lunar landing.

If Abelson wishes to maintain the position that the public does not support the space program, or that the program is creating a hardship on our educational or economic institutions, then let him do so in a rational manner. But let's not fault the program because, as he puts it, few popular songs have been written about Mars.

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The list of "moon songs" (29 Oct., p. 594) published in support of Abelson's case for the popularity of the moon stirred the memories in my blood. And when I read his comment that "our manned space program has consisted of a series of great technological stunts" in which the "acrobatic team must constantly increase the complexity of its act to hold the audience's attention," once again I heard the voice of Helen Kane, the boop-boop-a-doop girl, singing "Don't Be Like That" (1929). Surely it would be possible to say "achievements" instead of "stunts" and to point out that science as a whole rapidly increases in complexity!

The song data clearly show that interest in the moon is reaching the vanishing point (Fig. 1). Mars (which rhymes with "stars," a favorite word of the librettists) may soon be on the way up (*1*). Abelson asks, "How many people know where Mars is, or even care?" May we always address our efforts to dispelling unawareness and insouciance wherever they exist!

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Note

1. A recent entry in the field (to the tune of "Dream a Little Dream of Me"):

Mars shining bright above you,
Oh, voyager, the asteroids love you!
Phil Abelson is hoping to see
Just how sterile space can be!
Moon in the void behind us;
How can the tracing stations now find us?
From gravity we're totally free,
Rocket ship and you and me.
Van Allen's big belts are far distant,
We're out of their field.
To solar flares we are resistant,
Thanks to our shield.
Canopus in position
Sends us a light to keep us on mission.
We climbed out with a one-point-five G—
Soon we'll be in apogee!

Game Theory

The remark by John W. Hamblen (Letters, p. 965) that "We establish . . . a high code of ethics in the classroom and then send our graduates out to compete in a world that is quite different" is roughly parallel to something Alexander Meiklejohn said in an address some 40 years ago. Meiklejohn pointed out the difference between tennis (in which one leans over backward to be strictly honest and generous to one's opponent) and baseball (in which anything goes if one doesn't get caught at it—and razzing is a part of the game). Then he said something like "Our trouble is that we are receiving a tennis education for a baseball world."

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