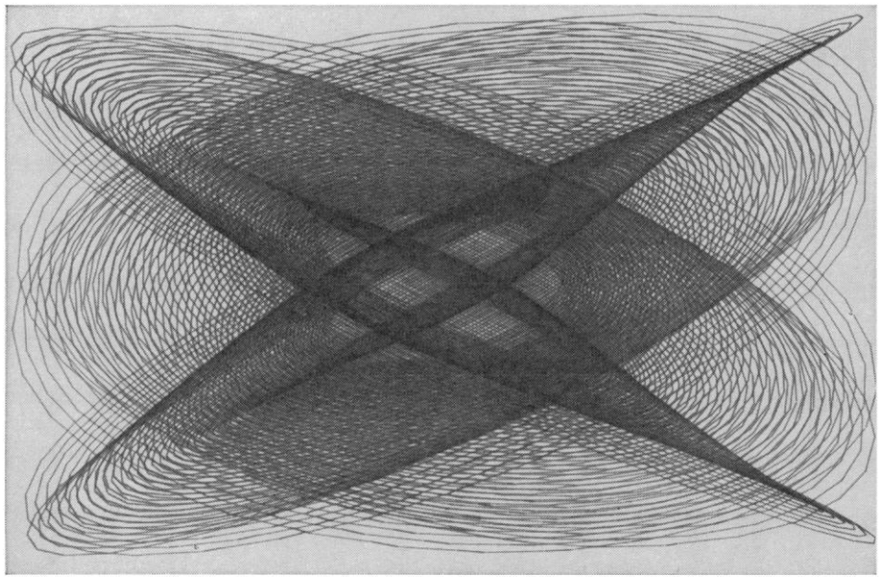

Fig. 1. A Lissajous figure produced by computer. The input data were $T_1 = 3.04$, $T = 3.65$, $\alpha = .7854$, $a = .900$, $b = .600$, $\delta t = .100$, total time = 912.0, and $\psi = 1.40 \times 10^{-3}$. Another example appears on the cover.

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 $\psi = \mu/2m$, $\mu$ is the coefficient of air friction, $m$ the mass of the pendulum bob, $\alpha$ 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 $T_1$, $T$, $\alpha$, $a$, $b$, $\delta t$, total time, and $\psi$; $\delta t$ is the interval at which points $(x, y)$ are calculated. The time $t$ is initially set to zero, then increased by $\delta t$, 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 pictures 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-