paper numbers, or hand lettering with the aid of lettering devices, and commonly reduce their tables so extremely that illegibility is the result.

I plead, not only for myself but for other disgusted persons as well, for a new deal in lantern-slide making, for a general reduction in the quantities of data presented on a single slide, and for more care in the arrangement of figures on such slides. The persons who attend such sessions, lengthy as they are and consisting of many papers presented in rapid succession, are interested primarily in the experimental procedures used and in the general conclusions derived from the experiments, not in masses of detailed data. George Sarton, in *The scientific basis of the history of science* (Carnegie Instn Publ. No. 501, 1938, 456–481) has commented succinctly and pointedly upon this aspect of paper presentation: "Oral teaching is essentially different (from written teaching), for an audience, however carefully it may listen, cannot analyze the details, but only obtain a general impression of a subject. . . . In fact it would be wrong for him (the oral teacher) to overload his account with details which would simply obscure his message without compensation. . . . The best proof that that distinction is generally overlooked is the common practice of 'reading' papers at scientific meetings. It is clear that a paper carefully written for the sake of students who will examine it, each by himself at his own speed, cannot be meant to be read aloud to a group of other men, however attentive the latter may be. To read aloud in public a paper meant to be scrutinized quietly in one's own workshop is just as foolish as it would be to paint dainty miniatures on the surface of large walls. The walls call for broad frescoes; and so do listening audiences wait for general outlines, which they can understand and assimilate at once, not for microscopic analyses which they are unable to follow."

Mr. Sarton's comments may be somewhat extreme, for many scientists, hearing scientific papers, desire to see the basic data from which the general conclusions are derived. Nevertheless, more discrimination can be used in the selection of data for visual presentation and more care exercised in their physical preparation. I therefore make the following specific recommendations:

(1) In preparing lantern slides of numerical data, use a direct typing method rather than a photographic reduction method. Commercial lantern-slide blanks, consisting of cellulose-compound films and a special type of carbon paper which does not smear, are available for direct typing. Or one may prepare his own slides, utilizing the Permafilm method described by Hans Neuberger (*Science*, January 2, p. 23). Slides thus prepared produce projected images clearly readable by all persons in an auditorium seating up to 500 persons.

(2) Use standard $3\frac{1}{4}'' \times 4''$ slides in preference to $2'' \times 2''$ slides for tabular presentations of data.

(3) If photographic reduction is essential to the inclusion of larger quantities of pertinent data, the reduction should be slight. In no case should more than 6 vertical and 5 horizontal columns be used on one slide.

(4) Data bearing upon the several aspects of a single problem or experiment should be presented on successive slides, rather than upon the same slide. For example, if one has performed investigations upon four experimental groups of a plant species and has examined their reactions to differing conditions in terms of, let us say, their total nitrogen, nitrate nitrogen, amino nitrogen, total carbohydrates, reducing sugars, polysaccharides, auxin content, magnesium, calcium, phosphate, etc., it is impossible to group all these data on one slide without such extreme reduction that the slide cannot be read. It is better to group the data on nitrogen fractions on one slide, those on carbohydrates on another, those on mineral constituents on another, etc.

(5) Whenever possible, data should be presented graphically. In preparing such slides, one should avoid using more than four or five curves per slide. The use of graphs makes possible the presentation of more data for comparative purposes on one slide than does the use of columns of numbers and is better adapted to the type of experimental report mentioned in the preceding paragraph.

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Projection of Artificial Meteor Trails on the Moon

N. J. Giddings, of Riverside, California, some years ago observed flashes of light apparently crossing the dark side of the young moon, which flashes were entirely confined to the moon and were not seen in the sky on either side. Dr. Giddings (*Science*, August 9, 1946, p. 146) requested an explanation.

I contributed a rather obvious suggestion (*Science*, November 8, 1946, p. 448), namely, that Giddings had seen a flight of meteors projected against the relatively dark, earth-lit side of the moon, invisible in the free sky because of magnitude equal to sky light but seen against the moon because of contrast with the "dark" background of the earth-lit portion. It was objected that this was impossible because the sky projected on the moon is actually brighter than the sky outside by the amount of total moonlight contributed. The point was well taken but was irrelevant, since in such a case the eye would compare, not the brightness of meteor and sky (assumed to be equal) but meteor and *background* seen *through* the sky—in this case assumed to be the dark side of the moon.

In June 1947, when conditions approximated those at Giddings' original observation, I tested this hypothesis by means of an apparatus consisting of a tube, 2″ in diameter, blackened inside, having a short length of resistance wire mounted within the tube between two diaphragms having apertures of 2 cm, the whole unit being 31″ from the eye end of the tube. The resistance wire was connected through outside leads to a rheostat by means of which its state of incandescence could be regulated at will. The first test was run June 22, 1947, at 6:00 P.M. (E.S.T.), the moon then being 4 days after new in a cloudless sky.

The wire was adjusted to white heat and the tube turned to the sky, the wire being visible as a thin, bright line projected on the sky to several degrees west of the moon. Its temperature was then reduced until it made a *black* line against the sky. When turned upon the moon, this line appeared as a feeble *red* line against the dark side of the moon, though remaining black in the sky outside. The test (which was witnessed) was repeated in the July lunation with the same result.

It is felt, therefore, that Dr. Giddings' original observation is entitled to serious credit, and that probably he had the absolutely unique experience of catching a flight of meteors at the moment of projection against the moon.

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Value of Cytochrome C in Anoxia of Newborn Guinea Pigs

Recent reports by Proger and his associates (*J. clin. Invest.*, 1945, 24, 864; *Science*, October 25, 1946, p. 389; *J. Pediat.*, 1946, 29, 729) concerning the role of cytochrome C as a therapeutic agent in combating the effects of tissue anoxia in man have aroused considerable interest. Proger has stated that cytochrome C is present in suboptimal amounts for the most efficient utilization of oxygen in the tissues and that injection of this material results in an increase in the blood and organ content of cytochrome. He has further shown that addition of cytochrome to homogenized tissue suspensions is followed by an increase in oxygen uptake. On the basis of these studies Proger has suggested that cytochrome might be useful in the treatment of asphyxia of the newborn.

As a preliminary to the possible application of this agent in human subjects we have studied the value of cytochrome C in counteracting the effects of induced anoxia in newborn guinea pigs. Animals less than 24 hrs old were placed in a chamber containing an atmosphere of pure nitrogen and allowed to remain until they had gone through a cycle of hyperpnea, convulsions, and, finally, slow gasping respirations or cessation of respirations. They were then removed from the chamber to permit recovery under normal atmospheric conditions. This process was repeated from 2 to 5 times, usually until prolonged artificial respiration was necessary for resuscitation. Prior to the test, each litter was divided, half the animals receiving an intraperitoneal injection of 1.9 mg of cytochrome C and the other half serving as controls. The tests were carried out 1 hr after injection.

We attempted to determine, first, whether injected animals, by virtue of more efficient utilization of oxygen remaining in their tissues, might retain consciousness for a longer period than uninjected litter mates sharing the chamber with them; second, whether injected animals, after cessation of respirations, could be more rapidly revived by artificial respiration and whether they would show a lesser immediate mortality; third, whether injected animals could be protected from the damaging sequelae of cerebral anoxia. In this connection, surviving animals at 12–16 weeks of age were tested for their ability to solve an alternating maze problem similar to that described by Windle and Becker (*Amer. J. Obstet. Gynec.*, 1943, 45, 183). The final score based on 35 trial runs took into account the factors of time, error, and necessity for prodding stimulation. Thus, the higher the score, the poorer the performance.

The results are summarized in Table 1. There was no observable difference in the two groups with regard to maintenance of consciousness, ease of resuscitation, or immediate mortality from anoxic exposure. Furthermore, both groups showed essentially similar degrees of impaired performance in the maze when compared with normal animals of the same age.

Recently Potter (*Science*, October 10, 1947, p. 342) has challenged Proger's basic premises with respect to cytochrome and has pointed out that increasing interest in the clinical use of cytochrome indicates the need for further studies. Negative reports by Scheinberg and Michel (*Science*, April 4, 1947, p. 365) and Stadie and Marsh (*J. clin. Invest.*, 1947, 26, 899) have appeared. Our experiments similarly fail to support the idea that cytochrome may be useful in the clinical treatment of anoxic states of newborn infants. It may be mentioned that in a separate series of experiments we attempted to determine the therapeutic efficacy of cytochrome C in the treatment of cyanide poisoning in rats. The results suggested that cytochrome may be of some value in the treatment of this condition. These studies will be described more fully at a later date.

TABLE 1

	No. of animals	Succumbed in chamber	Survived	Died of intercurrent inf.	Maze tests			
					No. of animals	Mean of avg. scores	σ	P.E.
Anoxia + cytochrome	43	11	32	9	17	33.2	3.15	0.52
Anoxia; no cytochrome	42	11	31	11	17	30.9	3.16	0.52
Normal controls	32	..	..	..	32	18.7	1.57	0.19

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