Comments and Communications

A Living *Metasequoia* in China

It is a rare occurrence when a plant genus originally based on paleobotanic records is found to have a living representative. In 1941 the genus *Metasequoia* was proposed and described to take certain species which had originally been described by various paleobotanists as representatives of the genus *Sequoia*; and, strange as it may seem, only 5 years after the group was characterized, a Chinese forester, Mr. Wang-chan, actually discovered three living trees representing an undescribed species of the genus in Szechuan. This discovery was made in February 1946. Later in the year C. Y. Hsueh was sent to Wan-hsien by Prof. Wan-Chun Cheng, of the National Central University of Nanking, to secure additional material. His field work brought the census of the large trees up to about 25 in the vicinity of Wan-hsien.

Intrigued with the possibility of securing seeds of this remarkable species when botanical specimens were received at the Arnold Arboretum early in 1947, a modest grant was made to Dr. H. H. Hu, of the Fan Memorial Institute of Biology, Peiping, in the summer of 1947. With this fund it was possible for Prof. Cheng to send a third expedition to the type locality in the fall of 1947, the leader of this expedition also being Mr. Hsueh. He spent about three months in the field, brought the census of the large trees up to over 100, and—what is most interesting—secured a quantity of seeds. He returned to Nanking early in December, and the first shipment of seeds of this new living species of *Metasequoia* reached the Arnold Arboretum on January 5, 1948.

Mr. Hsueh's field work in 1947 brought out the fact that the species actually extends into adjacent parts of Hupeh Province. This is a region not exactly unknown to European botanists, for at least two very keen collectors had traversed the region, one in the last century, the other in the early part of the present one. The large trees occur as widely scattered individuals over a distance of at least 100 miles, the Shui-sa-pa Valley in Hupeh taking its name from the local name of the species, *shui-pa* (*shui* = pine). We have no information, as yet, as to what the reproduction of the species may be, but the large old trees are very widely scattered. It is clear, however, that this sole living representative of a very ancient genus is now apparently on the verge of extinction. Seeds have already been distributed to selected institutions in various parts of the United States and Great Britain, and it is hoped that, somewhere, we may be able to establish the species in cultivation. A larger supply of seeds is expected in the near future.

Metasequoia, or its immediate ancestors, developed in Mesozoic times, when the animal life of the globe was dominated by the long-extinct giant reptiles. Like *Sequoia,* it was formerly of very wide distribution in the North Temperate Zone. To it has been transferred several paleobotanic species originally placed in *Sequoia,* from North America, Japan, Saghalien, and Manchuria. But the one living species now persists in a limited area in China, even as the two species of *Sequoia* persist in limited areas in California, last stands of ancient and formerly widely distributed types. It is suspected that the chances of this species persisting much longer in this, its last stand, are not too promising.

The discovery of a living representative of *Metasequoia* is an event of extraordinary interest to both botanists and paleobotanists. Two other cases occur to me where genera, actually described from living species of eastern Asia, prove to have been described under earlier and different names by the paleobotanists. Thus, *Petrophiloides,* originally described from fossil fruits found in the London clay flora, is older than *Platycarya,* the sole living species being of wide distribution in eastern Asia. *Caryojuglans,* originally described from fossil forms found in Europe, long antedates *Rhamphocarya,* the latter having been described in 1941 on the basis of living specimens found in Yunnan. These are both genera of the Juglandaceae, not as old, geologically speaking, as is this remarkable coniferous *Metasequoia.*

This living *Metasequoia* is a large tree, attaining a height of about 35m, with a trunk diameter up to 2.3m. A remarkable character about it is that, like *Larix* and *Pseudolarix,* it is deciduous, the trees being leafless in the winter months. Its botanical alliance is scarcely with *Sequoia,* as one might infer from the generic name. In its vegetative characters it suggests *Glyptostrobus* and *Taxodium,* but it may prove to be not closely allied to these two genera, one of southeastern China, the other of North America. Its technical description is not yet published, but when this appears, the true alliance of this ancient type will doubtless be determined.

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AAAS Meetings and Lantern Slides

During the recent AAAS meetings in Chicago, I heard 52 papers presented at the several sections of the Botanical Society of America and related organizations. The authors of 23 of these (nearly half the total) interspersed their talks with apologies for their lantern slides. The slides, which justly deserved profound apologies, had a common objectionable feature, namely, the crowded inclusion of such excessive amounts of data that persons seated more than three rows from the screen were unable to read either the numbers or the accompanying legends. The acme of wasted visual-aids effort was attained by one standard-sized lantern slide which presented 16 vertical columns and 12 horizontal columns of numerical data, so crowded that the perpetrator of the slide, although he stood within 8 feet of the screen, could scarcely decipher his own figures. Obviously, slides of this type contribute nothing to the understanding of the audience and are better omitted. In preparing such slides, the authors utilize the method of photographic reduction of tables prepared by typewriter, gummedpaper 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.