flora, which, I believe, are undeniable though they may have been exaggerated, must be explained by an indirect route, still to be discovered."

Unfortunately for us palæobotanists, at a congress in Heerlen (September 11, 1935) when these matters were discussed in a geological atmosphere, we could not induce Mr. Wadia, who was present, to take part in the discussion. For had he done so, we would have learned, there and then, that he had already found this much-needed evidence of a means of communication with the north, during his recent field work in north-west Kashmir and Hazara[8]. According to Wadia, until as late as the end of the Middle Carboniferous, a continuous land bridge must have stretched from the Punjab as far as the Pamir plateau and possibly beyond. This is proved by the occurrence of a well-marked regional unconformity between the marine Dogra slates, which are probably of Cambrian age, and the overlying agglomeratic slate, regarded as not older than Upper Carboniferous. The long period of time from the Cambrian until at least the end of the Middle Carboniferous was therefore a land period* in this area. This land bridge, as stated, must have stretched at least as far as the Pamir plateau. What the conditions were farther north we shall only know from the work of our Russian colleagues: quite possibly the land bridge was unbroken as far as the northern continent.

Wadia further states that even during Upper Carboniferous and Permian times, the Kashmir portion of the Tethys must have been studded with an archipelago of volcanic islands, which may well have permitted some intercourse for land plants between India and the north. Proof of this is to be found in the presence of carbonaceous matter as well as recognizable impressions of Gondwana plants at six or seven localities in the Permo-Carboniferous tuffs so extensively developed in this region.

I confess that, not being a geologist, I had at first failed to appreciate the full implications of this work, although I had read it early in 1935. Mr. Wadia, in his turn, told me recently that he had not at first realized how important for palæobotanists was the evidence that he had found. Zalessky's idea of a possible archipelago in the Tethys, which may have served as stepping stones for terrestrial forms of life migrating north, thus emerges as a prophetic utterance.

It remains to add that it is at Mr. Wadia's suggestion that I am writing the present note, which has been read by him. If conditions permit, we hope to present the whole evidence, from our respective points of view, before the International Geological Congress to be held in Moscow next year. On that occasion I also hope to be able to bring with me typical specimens of Indian Lower Gondwana plants for a direct comparison, now more urgent than ever, with the Gondwanoid members of the northern flora.

B. SAHNI.

University, Lucknow.
Aug. 8.

* There is here a possibility of finding evidence of the Devonian flora, which has not so far been discovered in India.

[1] Amalitzky, *Trav. Soc. Imp. Nat. St. Petersb.*, **28** (1897); *ibid., Compt. rend.*, **132**, 591 (1901); Zeiller, *Bull. Soc. Bot. France*, 392 (1898); Schmalhausen, *Mém. Acad. Imp. Sci. St. Pétersb.*, **27**, 4 (1879).
[2] Zalessky, *Mem. Com. Géol. N.S.*, Livr., 174, 5–6 (1918).
[3] Seward, "Plant Life through the Ages", pp. 161, 252 (1933).
[4] Grabau, "Stratigraphy of China", Pt. 1, Palæozoic and Older, p. 407 (1923–24).
[5] Sahni, *Proc. 13th Ind. Sci. Congr.*, Pres. Addr. (Geol. Sec.) Bombay, pp. 239–240 (Jan. 1926).
[6] Wadia, *Rec. Geol. Surv. Ind.*, 65 (ii), 189 (1931).
[7] Sahni, *Current Science*, **4**, 388 (1935).
[8] Wadia, *Rec. Geol. Surv. Ind.*, 68 (ii), 144 (1934).

Early Chinese Glass from Pre-Han to T'ang Times

IN a previous letter[1], Beck and Seligman described the analysis of a large ornamental glass "eye-bead" from the Han Chun graves near old Lo Yang, dating back to the second half of the third century B.C. or perhaps even earlier. This bead had the surprisingly high specific gravity of 3·57, and proved to be essentially a lead-barium silicate, with small amounts of soda, lime, alumina, etc. Prompted by this unexpected result, we have now extended our examination to a series of thirty-two specimens of Chinese glass, covering some twelve centuries, pre-Han and Han (*c.* 250 B.C., or earlier – A.D. 220) and T'ang (A.D. 618–907). Within these broad limits, there is little reasonable doubt as to the correct dating of the pre-Han and Han specimens. It is more difficult to be certain of the T'ang; perhaps all the specimens so attributed may be of this period, and some certainly are. As most of the specimens were of considerable value, only minute samples could be removed for analysis. The work was carried out spectrographically, and though accurately qualitative, no attempt was made to place it on more than an approximately quantitative basis.

While it is obviously not permissible to generalize too freely from such a limited number of specimens, a broad general fact emerges—namely, that in passing from pre-Han to T'ang times, Chinese glass tends to change from a lead-barium silicate type (so far unique) to a lead-soda-lime silicate type and to the more common soda-lime silicate type. The results may be grouped as follows:

(1) Twenty-three specimens of pre-Han and Han glass were examined, including eleven "eye-beads", more or less resembling the type originally described. Twenty belonged essentially to the system PbO : BaO : SiO_2, with small amounts of soda, lime, etc.; the lead was usually accompanied by tin and silver, and often by traces of bismuth and antimony. The specific gravity ranged from 3·25 to 5·25. The remaining three specimens contained no barium.

(2) Nine specimens of T'ang glass were examined. Seven were essentially soda-lime silicates, and two lead-soda-lime silicates. No barium was found, save a trace in three specimens.

An extended statement of the spectrographic analyses summarized in this preliminary note will be published by one of us (P. D. R.) in "Technical Studies in the Field of the Fine Arts", together with analyses of a number of intermediate specimens, which are less definitely dated but may be thought to range from the post-Han period to that of the Wei, say, third to sixth centuries A.D.

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[1] NATURE, **133**, 982 (1934).

A Cosmic Ray Burst at a Depth equivalent to 800 m. of Water

WE have recently made measurements of cosmic ray intensities in the Simidu tunnel of the Government Railways of Japan. The measurements were carried out at different positions along its length of 9·7 km., in order to find the penetration of cosmic rays through various thicknesses of rocks, which consist mainly of diolite, the average density being probably 2·8. The measuring apparatus was the Neher electroscope[1] with which Dr. Millikan kindly