are shown in Figs. 3 and 4. There is, of course, no standard method of assessing results from sub-size specimens in terms of a given specific energy absorption, but it will be seen from the graphs that for any given value of energy absorption in the low-energy region the shifts in the curves due to irradiation are very nearly the same for both aged and normalized material. The results from tensile tests are given in Table 2.

Table 2

	Yield strength (kgm./mm.²)	Tensile strength (kgm./mm.²)	Uniform elongation (per cent)	Total elongation (per cent)
Normalized	31	53	18	32
Normalized and irradiated	43	60	15	26 26
Aged	60	61	5	19
Aged and irradiated	68	69	5	16

We therefore conclude that, in this particular case, effects due to neutron irradiation and those due to ageing must be considered as additive.

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GEOLOGY

Age of the Cuddapahs, India

IN India, the term 'Archaean' has been applied to the formations below the so-called Eparchaean unconformity—the unconformity at the base of the Cuddapahs and their equivalents. The importance of the Cuddapahs as a chronostratigraphic unit arises out of this consideration. Investigations were initiated by me to date the galenas occurring in Cuddapahs and related formations. This communication presents preliminary results of the lead isotope studies.

The locations, modes of occurrence and stratigraphic positions of the host rocks of galenas are given in Table 1.

Galena is separated from the host rock without introducing contamination, and lustrous, unaltered crystals are hand-picked and powdered. Lead sulphide is converted into lead chloride and then into lead tetramethyl. The experimental set-up and the chemical procedure suggested by Collins et al.¹ were largely followed, with some modifications which were necessitated by the extremely high humidity (85–95 per cent) at Bombay during summer when this work was undertaken. The lead isotopic abundances were determined with a C.E.C. gas source mass-spectrometer (model 21-103 C; 5 in.; 180° instru-

Table 2

Sl. No.	Area	²⁰⁴Pb	²⁰⁶Pb	²⁰⁷Pb	²⁰⁸Pb	Preferred model age (m.y.)	Remarks
1	Zangam-rajupalle	1	15·86	14·49	34·70	780* 840†	Precambrian
2	Khammam	1	16·18	14·60	35·73	650* 720†	Precambrian
3	Dhone	1	57·96	20·11	49·87	–	J-type lead

* Houtermann's formula: constants of Russell and Farquhar (ref. 3).
† Houtermann's formula: constants of Moorbath (ref. 4) calculated from the unpublished tables of R. P. C. Pockley.

ment). Not less than 40 sets of peaks were recorded for each run, and the run was repeated starting with a fresh aliquot of the original mineral sample. Peaks were recorded both in the elemental lead and tri-methyl lead regions, though the latter were used principally in the computations. The mass resolution of the instrument is about 1 part in 300 and the average reproducibility for peak heights is about 0·5 per cent for lead-206, -207 and -208 and about 1 per cent for lead-204. The peaks were corrected for hydride formation, carbon-12/carbon-13 effect and loss of hydrogen, by the method of Bate et al.⁸.

The lead isotopic abundance data and the preferred model ages (calculated from 206/204 and 207/204 ratios) are given in Table 2.

The model age of the Zangamrajupalle galena (780–840 m.y.) is not inconsistent with the view that Delhis may be approximately the time equivalents of Cuddapahs, since the post-Delhi pegmatites were found to be 735 m.y. old⁵. The present galena date indicates that the Cuddapahs may be younger than the Dharwars (2,400 m.y.), Eastern Ghats (1,600 m.y.) and Satpuras (950 m.y.)⁵,⁶, which conclusion is consistent with geological evidence.

The Pakhals were regarded by King⁷ as time equivalents of Cuddapahs. Mahadevan⁸ considered Pakhals as being comparable with Middle Dharwars. The model age of Khammam galena (650–720 m.y.) does not constitute any conclusive evidence to support either of the surmises.

The Dhone galena has yielded a J-type lead with one of the highest radiogenic components ever reported in the literature, if not the highest ever. The significance of this extreme type of isotopic constitution is under investigation.

It must be clearly stated that since the above conclusions are based on model ages of a few leads, they should be taken as merely pointers, to be checked against more extensive data which are being accumulated.

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Table 1

Sl. No.	General area	Location	Geological formation in which galena occurs
1	Zangamrajupalle, Cuddapah district	14° 45′ 22″; 78° 51′ 33″	Veins in the Cumbum shales belonging to Nallamalai series of the Cuddapah system
2	Rudrammakota, Khammam district	17° 14′ 20″; 80° 12′ 11″	Disseminations in the limestones of the Pakhal series. (= Cuddapahs ?) (= Middle Dharwars ?)
3	Kambalapadu, near Dhone, Kurnool district	15° 30′ 50″; 77° 49′	Disseminations in the porphyritic pink granite. (= Closepet granite ?)