A reexamination of available Pb-U-Th data on chondrites revealed a number of aspects which seem to have been either overlooked or misinterpreted. The following is a condensed outline:

1) Allende data (1, 2) are plotted on an \( \frac{^{208}Pb}{^{206}Pb} \)-versus-\( \frac{^{207}Pb}{^{206}Pb} \) diagram (Fig. 1) and 10 data points are shown to define a line. The two end members of such a mixing line are primordial lead, \( P \), and the insitu-decay lead, \( I \). The latter is obtained from the intersection of the mixing line with a line (dashed in Fig. 1) perpendicular to the ordinate at \( \frac{^{207}Pb}{^{206}Pb} \) = 0.62. From \( I \) one calculates \( K = \frac{Th}{U} \). The 10 data points are consistent with \( K = 4.04 \) while the measured values range from 2.68 to 6.94. Note other inconsistencies, e.g., 11% and 15% deviations for the pink aggregate and the pink inclusion, respectively. Conclusion: There exists pervasive U-Th mobility in Allende on the chondrule scale at \( \approx 0 \) age.

2) From U-Pb data, a metamorphic age of 280 m.y. was "determined" for Allende and given geologic interpretation (2). In view of the well-documented Pb-Pb age of 4.56 b.y. for Allende (1, 2), no additional age significantly older than zero (e.g., 280 m.y.) is permissible. The Pb data uncorrected for primordial Pb are shown on a concordia diagram (Fig. 2). Line P-I is the mixing line for 4.56 b.y. closed systems. Dashed line corresponds to the 280 m.y. isochron. The data scatter around P-I and are far removed from the 280 m.y. line. Conclusions: a) The 280 m.y. age is a data-processing artifact; b) Scatter indicates recent U-Pb redistribution; c) Some matrix and whole-rock samples fall off the P-I mixing line indicating either Pb contamination or recent large-scale U-Pb mobility.

3) Evidence to possible large scale U-Th mobility is provided in Fig. 3 where 5 carbonaceous meteorites are seen to define a mixing line corresponding to a constant \( K \) (whose value depends on the age \( T \)) but the measured \( K \) ranges from 3.62 to 4.20 (1, 3). This discrepancy is caused by either analytical problems or recent U-Th mobility on \( \approx 1 \) g scale.

4) Note in Fig. 3 that the low metamorphic grade Enstatite chondrites Saint Sauveur and Indarch are colinear with the carbonaceous meteorites while the highly metamorphosed ordinary meteorites like Modoc, Homestead and Knyahinya deviate from the trend, as do the achondrites and Angra dos Reis (not shown). Apparently early differentiation and metamorphism which resulted in depletion of primordial Pb also caused loss of Th relative to U in these bodies.

5) It was suggested (1) that Orgueil and the other carbonaceous meteorites have initial Pb significantly different from the values obtained from Canyon Diablo troilite (denoted \( P \) in all Figs.). In Fig. 4 the carbonaceous meteorites define a 4.50 b.y. line passing through \( P \). The newly suggested initial denoted OPI (Orgueil pseudo initial) falls on the same line indicating the strong possibility that OPI is composed of two components, one being \( P \) and the other is 4.5 b.y. in situ decay Pb. Conclusion: OPI is an artifact made possible through recent U loss from Orgueil.

6) Pb-Pb age for Allende matrix is 4.50 b.y. while the chondrules' age is 4.55 b.y. (1, 2). Thus the possibility of a measurably different initial for the matrix was entertained (1, 2). The data as presented in Fig. 4 show that this possibility is precluded which indicates a low \( u \) for the source. From Fig. 4, for \( P \), the upper limit to \( \Delta(207/206) \) is 0.25% which corresponds
Fig. 1: 208,207,206Pb correlation for Allende. Samples falling on the same line have identical calculated K. 

Fig. 2: U-Pb correlation for Allende data uncorrected for primordial Pb. Scatter around the 4.56 b.y. mixing line, P-I, indicates recent U-Pb mobility. The 280 m.y. "isochron" is invalid. 

Fig. 3: 208,207,206Pb correlations. Carbonaceous meteorites fall on a line (i.e., have same K). Low metamorphic type E chondrites fall on the carbonaceous line but highly metamorphic ordinary meteorites do not (data from ref. 1-5). Symbols explained next page. 

Fig. 4: 207,206,204Pb correlation for carbonaceous meteorites. Symbols as in Fig. 3. Line is consistent with Canyon Diablo troilite lead, P. Orgueil pseudo initial (OPI) falls on the line. Error bars are 0.2% on the Y axis and 0.5% on the X axis. Note deviation of Karoonda (Ka).
Fig. 5: 208,207,206Pb correlation for some Barwell samples (7): WR=whole rock; C=chondrule; Tr=troilite; NM=non magnetic; 2mm=outer 2mm; BaPI=Barwell pseudo initial. Data fall on a line consistent with K=4.25. For Troilite K=0.75 indicates severe disturbance and invalidates BaPI. Symbols of Fig. 3: Carbonaceous meteorites: Murray (My), Orgueil (O), Murchison (Mn), Karoonda (Ko), Allende (A). Type E chondrites: Saint Sauveur (Sv) and Indarch (In). Ordinary meteorites: Homestead (Ho), Knyahinya (K) and Modoe (Mo). MT=modern terrestrial Pb (6).

to an upper limit of μ = 2. On a more expanded version of Fig. 4 (not shown) the 4.50 b.y. isochron intersects the 4.55 b.y. isochron at a point consistent with a source for which μ = 0.25. With such a low value, Pb would evolve by $6 \times 10^{-4}$ in the first 100 m.y. This change in P is far beyond our resolution capability (which is hampered by blank correction) and, if true, makes fine time-resolution for early solar system exceedingly difficult.

7) On the basis of U-Pb analysis in troilite from the Barwell chondrite it was suggested that Barwell may have an initial Pb radically different from Canyon Diablo primordial, P (7). As shown in Fig. 5, six of Barwell samples define a line on the 208,207,206Pb diagram indicating Pb evolution in an environment of constant K = 4.25. This conclusion is independent of whether P or the newly suggested BaPI (Barwell pseudo initial) is the actual end point, because they both fall on the line. The actually measured K values for whole-rock samples WR1 and WR3 at 4.30 and 4.19 (7) are, within errors, in agreement with the calculated value while for individual components the measured K ranges from 0.75 to 4.16 indicating recent U-Th mobility. For the troilite (Tr) the value of 0.75 shows that this phase has been exceedingly disturbed recently and thus it is unfit for initial Pb calculation (i.e., BaPI is an artifact). In variance with the conclusion that Barwell's isochron on 207,206,204Pb diagram deviates from P (7) the author finds the isochron (not shown) compatible with P but misses the troilite point. From considerations of U-Pb and Th-Pb systematics the Pb composition of Barwell troilite is consistent with—not necessarily due to—huge Pb gain which often signifies Pb contamination; thus its deviation from the Pb-Pb isochron is not particularly mystifying.

The artifacts pointed out in this abstract are but a minor aspect of the overall output of the colleagues criticized. In this connection it is only fair to acknowledge their many years of truly substantive contributions to the wonderful world of plumbology.