provide us with knowledge on the upper air conditions rather than those of the lower atmosphere.

The explanation of these results on the basis of the instability of the meson will be given elsewhere.

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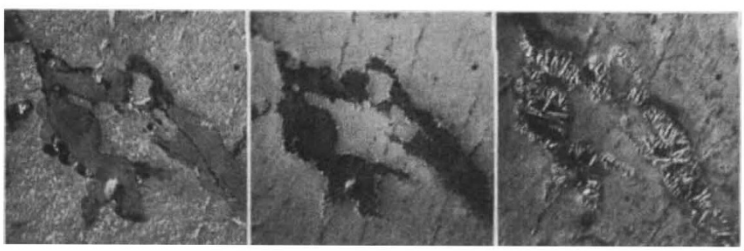
[1] Nishina, Y., Arakawa, H., Sekido, Y., and Simamura, H., *Phys. Rev.*, in the press.

A Lead Etching Effect

THE observations described below have been made in the course of the metallographical examination of some samples of ancient lead of Roman origin (*ca.* second century A.D.). These leads, hailing from Corbridge, Northumberland, and Pentre Ffwrndan, Flintshire, appear to have been left in the furnaces in which they were produced, and were evidently, at the end of furnace operations, in an oxidized condition, for they now contain patches of red litharge, which occupy blow-holes and rifts in the metal. This litharge has been isolated and its identity proved by tests and also analytically, two preparations from different sources being found to contain 95·6 and 97·7 per cent of PbO, the balance being mainly infiltrated carbonates of iron and calcium.



A *B* *C*

MICROGRAPHS OF LEAD CONTAINING INCLUSIONS OF LITHARGE (× 25).

For etching sections of these samples, an extremely dilute solution of hydrochloric acid, at the boiling temperature, proved satisfactory, since its attack on the litharge is limited and, at the same time, the surface of the lead is cleansed by it. A striking result of this mode of operating is that the lead in contact with litharge, whether embedded in it, or surrounding an inclusion of the oxide, becomes fringed with dendrites of lead. This is illustrated in the accompanying micrographs (× 25), *A* being that of a polished surface of lead, with inclusion of litharge, *B* and *C* the same area after immersion in the etching medium for 10 and 30 seconds respectively.

At first sight, these appearances suggest that a pre-existing relationship of the two constituents, such as would arise from the solidification of the metal in a fluid lithargic medium, had been unmasked by etching; but this is obviously impossible since the freezing point of the litharge is about 600° C. above that of lead. Further, the perfection of the dendritic forms at various stages of development should be noted, which suggests continuous growth of the lead crystals during the etching process.

Such considerations led to the conclusion that the *phenomenon resulted from chemical* changes taking place during the etching process; and it happens that my attention had already been directed, by other observations in this field, to the fact that when lead and litharge are placed in contact, covered with water, and the water slightly acidified with one of the common acids (hydrochloric, nitric, acetic), a lead-tree is formed, the deposition of the lead being sometimes in the form of delicate dendrites, sometimes in compact masses of equiaxial crystals, among which well-shaped cubo-octahedrons can occasionally be discerned. The appearances shown by these ancient leads can be imitated perfectly by binding together a piece of sheet lead with a tablet of litharge (either cut from the massive material, or made by compressing the powder), or even with a plate of tabular cerussite, then cutting a cross-section through the two and etching in the manner described above.

These reactions are obviously related to those which have been observed on the precipitation of lead from solutions of its salts by lead itself, which result in the formation of what has been termed an autogenous lead-tree. Nearly a century ago, Wöhler[1] observed this to happen when a rod of lead was immersed in a concentrated solution either of nitrate or acetate of lead over which water was poured carefully, so that the liquids did not become mixed; precipitation then occurs on the part of the metal in the concentrated solution. There can be little doubt that the explanation of the etching effect described here is to be sought in a similar difference of concentration of the lead solution produced by the action of the etching acid on the litharge. It is remarkable that the action should be so speedy and should take place even when the specimen is held in an inverted position and moved continually to and fro.

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Wöhler, F., *Ann. Chem.*, **83**, 253 (1853).

Congenital Hyperglycæmia in Mice

Cammidge and Howard[1] have published some very remarkable results concerning the genetics of hyperglycæmia in mice. They state that their mice fell into two groups. In one of them the concentration of blood glucose, estimated by Folin and Wu's method, lay between 124 and 114 mgm. per 100 ml. In the other it lay between 88 and 74. The hyperglycæmic condition behaved as a recessive, and was not linked with albinism.

The accompanying table shows the striking fact that in each of the seven families which segregated, the observed figures agreed with the expectation to the nearest unit. The expectations in each column are given in italics immediately after the observed