been repeated in our laboratories and isobutene 100% pure is obtained by this method.

RESEARCH AND DEVELOPMENT LABORATORIES HERMAN PINES
UNIVERSAL OIL PRODUCTS COMPANY
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REMARKS CONCERNING THE PAPER OF G. P. BAXTER AND C. M. ALTER "THE ATOMIC WEIGHT OF LEAD FROM KATANGA PITCHBLENDE"

Sir:

G. P. Baxter and C. M. Alter [THIS JOURNAL, **55**, 2785 (1933)] discuss the theory of the origin of the actinium series [Grosse, *Phys. Rev.*, **42**, 565 (1932)] on the basis of their careful and thorough experimental investigations of the atomic weight of uranium lead from Katanga pitchblende. They find that the lead extracted from the altered yellow portions of the mineral has a lower atomic weight than the lead from the original pitchblende and see in this fact a contradiction to the theory.

We consider that their findings support the theory and think the following the most plausible explanation of the facts.

It is usually considered by mineralogists and geologists [see for instance A. Holmes, "The Age of the Earth," pp. 207–217; G. Kirsch, "Geologie and Radioaktivitat," Chapter III] that lead is leached out from pitchblendes with much greater difficulty than uranium. This is due (1) to its much smaller concentration; (2) to the fact that it forms an insoluble uranate, and generally, because of its chemical nature, lead is much less soluble in acid and alkaline waters than uranium, which easily gives soluble uranyl complex salts. It is, therefore, natural to conclude that the uranium, leached out of the original mineral and redeposited in its veins and crevices, will be, to a great extent, free from U-Pb and being of a younger age, will produce, according to the actino-uranium theory, U-Pb containing less AcD and which therefore will have a lower atomic weight, as was actually found by Baxter and Alter. Furthermore, since this secondary uranium mineral is much more exposed to further leaching, its Pb/U ratio might be easily higher than the true ratio and lead to a wrong estimate of its age.

All of these considerations are only valid in the absence of ordinary lead. A strong indication that such is the case here is given by the low atomic weight figures of Baxter and Alter and is definitely proved by F. W. Aston's mass analysis of Katanga lead [*Nature*, **129**, 649 (1932)].

In conclusion we may state that the actino-uranium theory offers new possibilities for checking geological age determinations and elucidating the phenomena of leaching and other alterations of uranium minerals.

KENT CHEMICAL LABORATORY A. V. GROSSE
UNIVERSITY OF CHICAGO
CHICAGO, ILLINOIS
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