

stubby prisms up to $\frac{1}{4}$ inch—are largest in association with allanite and zircon, in both of which it is a common inclusion.

Uranothorite was found in only one small red perthite-quartz pod, where it apparently occurs without allanite, apatite, beryl, or zircon. The largest crystal found measures $\frac{1}{2}$ inch by $1\frac{1}{2}$ inches. It is dark brown with many streaks and irregular masses of orange color. It is apparently completely metamict. Unlike allanite, apatite, beryl, and zircon, the uranothorite crystals are not fractured. Aureoles of the apple-green fluorescence common to secondary uranium minerals surround the crystals; the fluorescing substance is not visible in ordinary light. The identification as uranothorite was kindly checked by Joseph Murdoch.

REFERENCES

- HIGGS, D. V. (1950), Anorthosite and related rocks of the western San Gabriel Mountains, Southern California: *Ph.D. thesis*, Univ. Calif., Los Angeles.
- MURDOCH, J., AND WEBB, R. W. (1952), Minerals of California: *California Div. Mines, Bull.* 136, 1952 supplement.

A MODIFICATION OF THE CHAYES POINT COUNTER STAGE

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In 1949 Chayes described a point counter suitable for attachment to a standard Spencer or Bausch and Lomb petrographic mechanical stage. In this device leaf springs mounted on the stage engage click wheels mounted on the horizontal and vertical shafts to furnish the point stops used in count analysis (see Chayes' description).

The present modification, designed and made by Mr. W. F. Mueller,* is an improvement over the original in three respects:

1. Lighter clicking action requiring less work for each point change.
2. Positive centering at each point (*i.e.*, no play when the plunger is engaged in the click wheel).
3. A simple arrangement for disengagement of the point-counting device so that the stage may be used for ordinary traversing.

The point counter stage is shown in Fig. 1; a cross-sectional diagram of the working mechanism is presented in Fig. 2. A pointed plunger (*a*) is mounted in a housing (*b*) containing a light coil spring. The plunger point is sharper than the indentation in the leaf spring of the original design; this permits deeper and narrower slots in the click wheel (*c*) and thus reduces play. The shoulders of the slots are slightly rounded as is

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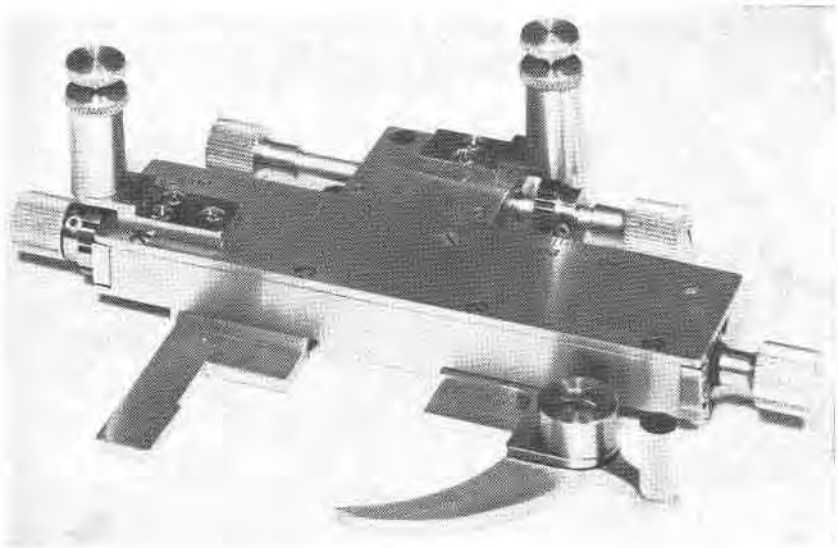


FIG. 1. The point counter stage.

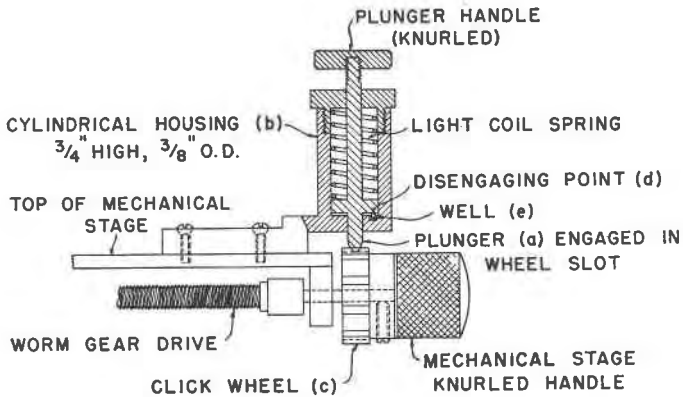


FIG. 2. Cross sectional view of point counter.

the plunger point; these features make for a light touch in operation. The purely vertical motion of the plunger eliminates horizontal drag and the consequent "settling" encountered when a leaf spring is used. The stage may be used for non-point traversing by retracting the disengaging point (*d*) from its well (*e*); this pulls the plunger point clear of the click wheel.

The stage described herein has 0.25 mm. spacing for horizontal traverses and 0.5 mm. spacing for vertical traverses. It is somewhat more

expensive to make than the leaf-spring type but the advantages gained in the ease and speed of operation will soon offset the original cost.

REFERENCE

- CHAYES, F., A simple point counter for thin-section analysis: *Am. Mineral.*, **34**, 1-12 (1949).

THE CHEMICAL FORMULA OF CLARKEITE¹

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The mineral clarkeite in pegmatites from Spruce Pine, N. C., when first described by Ross, Henderson, and Posnjak (1931) was given the formula $RO \cdot 3UO_3 \cdot 3H_2O$. In their paper (p. 214) they state: "Alkalies are the essential RO constituents and sodium predominates over potassium. Analysis No. 1 is closely similar to No. 2, the only essential difference being a slight excess of calcium in the former. The quantity of lead and alkalies is nearly the same in the two analyses and the uranium contents agree very closely. Both analyses contain only small quantities of iron and aluminum oxides but there is a difference in the water content." They also give a diagram of an x -ray picture which agrees with one obtained by Frondel of the same material. A film (Table 1) obtained by us from a sample received from the Trace Elements Laboratory of the U. S. Geological Survey which is labelled *TE-1334* also agrees within reasonable limits.

The author was able to synthesize clarkeite in a number of experiments (Gruner, 1952) from uranyl nitrate solutions and $CaCO_3$ or CaO . While the x -ray patterns unquestionably agreed with the natural material there was reason to suspect judging by the orange buff color that the synthetic clarkeite was mechanically mixed with uranyl hydroxides and possibly uranyl silicates and carbonates. Therefore, no analyses were made of these synthetics. It is evident, however, that no Pb, Na, or other alkalies are contaminants in them, as they were absent in the experiments.

Among our older chemical reagents we found a container with orange buff $Na_2U_2O_7$ (Uransaures Natrium) made by A. C. F. Kahlbaum, Berlin. This material gave a very faint x -ray pattern of clarkeite. But on heating, the pattern improved and reached near-perfection after heating the sample five hours over the Bunsen burner at low redness. Table 1 gives the spacings and intensities of its lines compared with those of the natural and synthetic products. From the similarity of them and the

¹ Research done in connection with a contract of Division of Raw Materials of the U. S. Atomic Energy Commission.