TABLE I

Locality	% Water	% Cs_2O	Index of Refraction	Specific Gravity	Hardness	Unit Cell in Å
Hebron, Maine (1)*	1.50	36.10	1.5247 (Na)	2.98		
Tamminen pit, Greenwood, Maine (2)	1.62	35.83	1.522	2.97		13.65
Mount Mica, Maine (2)			1.520	2.90		
Elba (2)	2.40	34.30	1.520	2.90		13.66
Buckfield, Maine (2)			1.520	2.90		
Greenwood, Maine, Small crystals (2)	3.80	24.48	1.507	2.68		13.64
Leominster, Massachusetts (2)	2.04	33.06	1.520	2.89		13.65
Karibib, South West Africa (3)	2.66	30.2	1.517	2.86		
Varutrask, Sweden (4)	1.80	30.77	1.5218	2.917		
Black Hills, South Dakota (5)	3.45	23.46				
Lithia, Massachusetts			1.520	2.975	$5\frac{1}{4}$–$5\frac{1}{2}$	13.65

* Numbers indicate the references from which the data were obtained.

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AN INEXPENSIVE MICROSCOPE ILLUMINATOR

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The lamp herein described was designed for use with the petrological microscope when an inexpensive source of both transmitted and reflected light is desired. As may be seen in the photographs, the illuminator has two units. The lower unit provides excellent illumination for all purposes requiring the use of transmitted light, while the upper one produces illumination permitting observation of articles on the stage by reflected light. By means of the switch at the right one may be simultaneously turned on and the other extinguished.

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Details of Construction

The photographs show the general appearance of the illuminator. The details of the front face and right side will be found in Fig. 1. The internal arrangement of parts may be seen in Fig. 2.

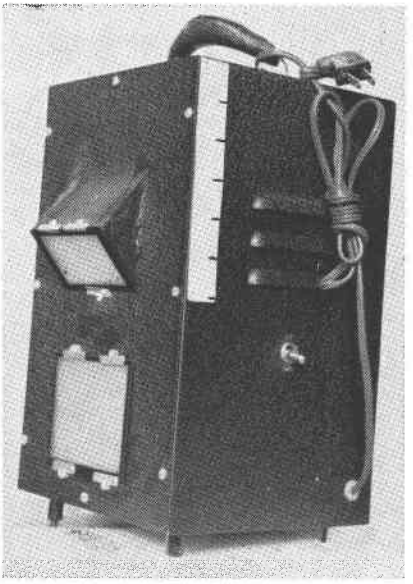

Fig. 1. General view of illuminator. Scale in figure is 6 inch ruler.

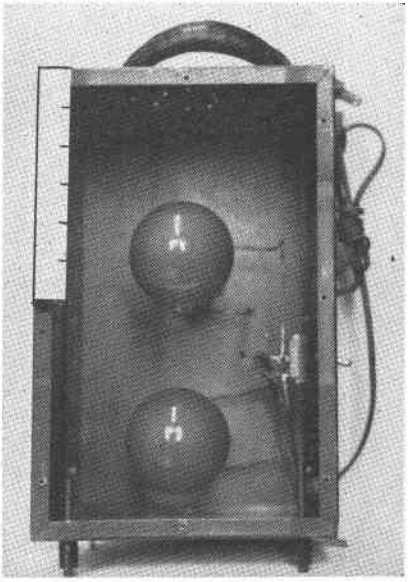

Fig. 2. Internal arrangement of parts. Scale in figure is 6 inch ruler.

The unit operates on 110–125 volts A.C. It is simple and inexpensive to build and operate. The total cost was $6.11. The size of the cabinet is $12'' \times 7\frac{3}{4}'' \times 7''$ but may be reduced considerably in every dimension if so desired. A complete parts list will be found at the end of this article. Many of the smaller parts are scrap for which other materials may be substituted.

Care should be exercised when cutting out the material to form the opening for the lower illuminator since this material may later be used to provide the triangles which are the sides of the upper light shield. The angles of these triangles are not critical since the unit may be mounted on legs which may be made easily of any reasonable diameter screws of any length over $\frac{3}{4}''$. These may be made adjustable by means of two nuts, one inside and one outside the cabinet. Additional refinements may include permanent $\frac{3}{4}''$ rear legs and adjustable front legs which are merely bakelite (or brass) rods set in shaft collars which are soldered to the

cabinet. All soldering should be done with a 1000 watt iron or, if available, a small spot welder.

Blue daylight 100 watt lamps are used. The lamp windows are merely frosted window glass. The mountings, in this case, were cut from the plates of an old variable electrical condenser; however, small aluminum plates are quite satisfactory since they easily may be shaped to fit the angles required.

Electrically, the unit consists of two circuits, one on each side of the switch wired in parallel to the center terminals of a double-pole-double-throw toggle switch. Figure 3 is a schematic diagram of the electrical circuit involved. The wire used should be no smaller than number 14 and placed carefully so as to prevent the possibility of shorting out the circuit. Wire of the above diameter or larger will be rigid enough to stay in place.

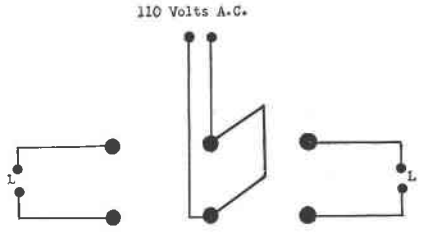

FIG. 3. Schematic wiring diagram. L = lamp socket.

It may be noted that the cabinet as listed is provided with louvres to remove internal heat. However, it is advisable to drill a series of small holes both on the top and bottom of the case in order to increase air circulation.

The parts list which follows includes all items bought by the author. Much of it may be found in scrap boxes and thus will reduce the total cost. Parts mentioned in the text which are not found in the list were scrap materials the author had on hand but total cost would not be over fifty cents.

PARTS LIST

Parts	*Current Price*
1 metal cabinet, I.C.A. type 3850 12″×7¾″×7″	$2.84
2 110 volt lamp sockets—16 cents each	.32
5 ft. of 2 conductor cable	.15
1 DPDT toggle switch, Cutler-Hammer type 7561-K4, 15 A., 125 V., bat handle	.85
1 6″×8″ window pane	.15
1 roll ¾″ No. 33 "scotch" electrical tape (black)	.55

2 daylight, blue, lamps—33 cents each	.66
1 bottle No. 145, Walsco touch-up paint, black	.39
1 110 V. A.C. male plug	.10
5 ft. No. 14 copper wire, enameled	.10
TOTAL COST	$6.11

The described illuminator enables a rapid change from transmitted to reflected light which is convenient for the examination of the opaque accessories in thin sections. The use of this illuminator eliminates the necessity of handling a rather warm lamp when a source of reflected light is required.

The author wishes to express his gratitude to Dr. F. Donald Bloss for his aid in the preparation of this paper.

LANTHANON AND SCANDIUM DISTRIBUTION IN WESTERN AUSTRALIAN FERGUSONITE

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Hand-picked fergusonite of detrital origin from the Marble Bar district of northern Western Australia has been found to contain a high proportion of ytterbium and erbium and a small proportion of scandium. The identity of the metamict material was established by optical, *x*-ray and differential thermal (1) examination, the results being confirmed by chemical analysis (2, 13):

Ta_2O_5	Nb_2O_5	TiO_2	Fe_2O_3	Y_2O_3	Ln_2O_3*	U_3O_8	ThO_2
49.4	2.70	2.50	<0.1	21.2	12.0	0.30	0.13%

* Total lanthanons.

Though the customary name for this material has been used it may be noted that the term 'formanite' is proposed in Dana's "*System of Mineralogy*" for material containing preponderating amounts of tantalum (3). The low thorium and uranium content of the Marble Bar product is notable and serves to differentiate it from material of otherwise similar composition from the neighbouring district of Cooglegong (4).

The lanthanon-yttrium fraction was examined spectrophotometrically and by chemical means as described elsewhere (5, 6, 7).

La_2O_3	Ce_2O_3	Pr_2O_5	Nd_2O_3	Sm_2O_3	Eu_2O_3	Gd_2O_3*
0.05	2.0	1.4	5.7	8.5	5.7	8.6%

Tb_2O_3*	Dy_2O_3	Ho_2O_3	Er_2O_3	Tm_2O_3	Yb_2O_3	Lu_2O_3*
1.7	11	3.1	15	4.3	27	5.7%

* Approximate values.