The optimum concentration for the clay being studied was determined experimentally but the clay flake thickness probably is not uniform. The sample occupied an area of about 2 cm.[2] and thus the average concentration of clay was 7.5 to 10 mg. per cm.[2]. Nickel foil also was tried but this causes excessive background radiation.

Typical results for a soil clay show a peak height of 180 cps (counts per second) at 1.50 Å and a background of 60 cps. This was with copper radiation at 35 KV and 23 ma. The slit system was as follows: 0.2° detector slit, MR soller slit, and a 1° beam slit. Several reflections other than (060) may be obtained. Aluminum itself has few reflections and these do not interfere with most of those obtained with clays. Patterns obtained with "randomly" oriented specimens using the counter method gave much less distinct (060) reflections and it often was necessary to resort to the time-consuming powder camera technique to obtain satisfactory measurements. Many methods currently employed to give "random" orientation of clays may be open to question because of the parallel orientation of clay flakes on packing. This orientation probably often reduces the intensity for the (060) and other reflections. The proposed method takes advantage of the orienting habit of clay particles.

Reference

1. Grim, R. E. (1953), Clay Mineralogy. McGraw-Hill Co., New York, p. 95.

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LARGE ANGULAR APERTURE AND USEFUL INTERFERENCE FIGURES

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Mineralogists and petrographers are, or should be, aware of the relation between angular aperture of the objective and the usefulness of the interference figure. The angular aperture determines the distance of various features such as melatopes, isogyres, and bisectrices, from the center of the interference figure, according to Mallard's law, $D=K\cdot n\cdot \sin r$, where D is measured distance from the center of the field, K is an instrumental constant depending upon the units of measurement of D and upon the numerical aperture of the objective, n is the appropriate refractive index of the crystal and r is the angle between the the microscope axis and the wave-normal-direction of the light traversing the crystal. If R is the radius of the field of view and A the numerical aperture of the objective, then $R=K\cdot A$, so that $K=R/A$, and Mallard's law becomes $D=(R/A)\cdot n\cdot \sin r$. Evidently increasing the A permits observation of interference effects at larger angles r.

Catalogs of a major manufacturer of polarizing microscopes have for the last months shown "recommended" sets of objectives and oculars without any reference to the common and widely-used 4 mm., 45×, $A=0.85$ "high-dry" objective, substituting for it an objective with the same focal length and magnification, but with $A=0.65$. The U. S. competitors of this firm now list either objective as standard equipment. It is my purpose to point out that the usefulness of interference figures obtained with an objective of smaller aperture is more limited than if obtained at higher aperture. This may be of minor importance in cases where only a crystal grain giving a well-centered figure can be used, but it may be very important in thin-section and in immersion work if only a few grains are available or in cases where well-centered interference figures are difficult to obtain. In these instances at least, the larger angular aperture of the objective with $A=0.85$ may permit making a sure interpretation of an off-center figure, whereas the one with the same magnification but $A=0.65$ would permit only a very uncertain interpretation, if any at all. It may be noted that students seem to be better able to interpret even well-centered interference figures obtained with objectives having $A=0.85$. The problem of distinguishing between the acute and the obtuse bisectrices for the determination of optic sign in plagioclases is especially difficult and common. It becomes trivial indeed if an oil-immersion objective with $A=1.25$ or greater is used, for both

TABLE 1*

Focal length	Magnification	Free working distance	Aperture		Max. measurable 2V if $\beta=1.55$ (e.g., in plagioclase)
			Numerical	Angular	
Dry objectives					
48 mm.	2x	52 mm.	$A=0.08$	9°	6°
32	4	21	.10	11.5	7.4
16	10	4.5	.25	28.5	18.6
8	20	1.44	.50	60.0	37.6
4	43	0.6	.66	81.4	49.6
4	43	0.3	.85	116.4	66.5
3	57	0.2	.85	116.4	66.5
Oil immersion					
1.8	97	0.13	1.25	110.2	107.5

* First four columns from American Optical Co., catalog, page F17; Bausch and Lomb Optical Co. lists essentially similar objectives.

melatopes would always be seen because 2H is measurable up to 110° (corresponding to an *obtuse* optic angle $2V_o$ of about 107° for plagioclase). This solution to the problem is impractical because it requires using the messy oil-immersion system for ordinary work. A good alternative is to use the *dry* objective with largest aperture ($A = 0.85$) as standard, not special, equipment. Table 1 shows some commonly available strain-free objectives for polarizing microscopes.

I hope that others will join me in requesting, for good reasons outlined above, that the "high-dry" objective of 4 mm. focal length and $A = 0.85$ shall not be abandoned, and indeed, shall be restored to a more prominent position in the manufacturer's catalogs.

A new publication *Hamburger Beiträge zur angewandten Mineralogie und Kristalphysik* is being published by Gebrüder Borntraeger, Berlin-Nikolassee. It is edited by Fr. K. Drescher-Kaden. Series 1 (1. Folge) 1956 is entitled "Festschrift zum 70. Geburtstag Hermann Rose," and has 337 pages, 159 tables and 105 figures.

It is with deep regret that we report the deaths of the following Fellows of the Mineralogical Society of America. Memorials will appear in a later issue.

Austin F. Rogers, March 3, 1957, at Berkeley, California
S. James Shand, April 20, 1957, at Dundee, Scotland
John C. Rabbitt, June 10, 1957, at Washington, D. C.

CHANGES IN COMMITTEES

Nominating Committee for Fellows:
R. C. Emmons replaces Ralph Holmes
Financial Advisory Committee:
Additional members: Arthur Montgomery and Marjorie Hooker
Committee for Awards and Medals:
Additional Member: A. F. Buddington
Committee on Obtaining Aid for the Hungarian National Museum:

I. Fankuchen, Chairman
C. Frondel
E. P. Henderson
B. F. Mason

RESULT OF QUESTIONNAIRE

In January, 1957 a questionnaire was sent to all fellows and members of the Mineralogical Society of America and to the subscribers of the AMERICAN MINERALOGIST. This questionnaire asked if members and subscribers would support *Mineralogical Abstracts* if its publication were undertaken as a joint effort of the British Mineralogical Society and Mineralogical Society of America. The following are the results of the questionnaire:

1. Are you now a subscriber to *Mineralogical Abstracts?*

   yes 431 no 610

2. If you are now a subscriber, in the interest of furthering mineralogy, will you subscribe to the new enlarged *Mineralogical Abstracts* to cost not more than $3.00 a year?

   yes 609 no 74

3. Are you willing to prepare some of the abstracts of American literature?

   yes 262 no 647

Enclosed with the questionnaire on *Mineralogical Abstracts* members and fellows of the Society also received a ballot on which they were requested to signify a preference regarding the symbols used for notation of refractive indices. The following are the results of that ballot:

α, β, γ—605 n_x, n_y, n_z—66 N_X, N_Y, N_Z—8 Miscellaneous—47

A summary of the information also requested on the ballot was as follows:

Fellows 205 Members 516 Male 687 Female 34

Employment		Major Interest	
Amateur	48	Chemistry	40
Consultant	25	Crystallography	53
Government	207	Engineering	15
Industry	139	Geochemistry	73
Museum	14	Geology	199
College Professor	28	Mineralogy	226
University Professor	227	Petrology	201
Miscellaneous	55	Miscellaneous	29