A lead-grey, fibrous mineral from the Binn valley, Switzerland.

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With a Chemical Analysis by G. T. Prior, M.A., D.Sc., F.R.S.[1]

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IN a paper published many years ago the following passage occurs under the section treating of seligmannite:—'Mingled with the seligmannite, and partially coating the baumhauerite, are a number of very fine needles of a lead-grey colour, the nature of which I have as yet been unable to determine.'[2] These needles form the subject of the present paper.

I later secured many more specimens on which the crystals are much larger, and are arranged in the form of a lattice in the cavities of the dolomite. Sometimes they are sprinkled with minute crystals of seligmannite. In a common type of grouping a bundle of slender prisms crosses similar bundles in such a way as to form approximately equiangular triangles. No crystal has been found to show faces except in the prism-zone.

In cleavage and the chocolate-coloured streak this mineral resembles others of these lead-grey minerals, such as liveingite, rathite, baumhauerite, and dufrenoysite.

[1] Communicated by permission of the Trustees of the British Museum.

[2] R. H. Solly, 'Some new minerals from the Binnenthal, Switzerland. Mineralogical Magazine, 1905, vol. xiv, pp. 72-82.

In the table below I record the angles observed on different crystals, the measurements in every instance being made from the cleavage-face. From the chemical analysis, which was kindly made by Dr. G. T. Prior, it appears that the composition of the crystals corresponds to rathite; but, on the other hand, as regards their interfacial angles, it will be seen from the table that they accord more closely with dufrenoysite. In the table are given the angles in the zones [100 : 010] of rathite and [010 : 001] of dufrenoysite, and also those in the zone [100 : 010] of hutchinsonite, which are added, because it is not without significance how closely they agree with the angles found for the present crystals. In each case the origin of measurements is the cleavage-face, which is (100) in hutchinsonite and rathite, and (010) in dufrenoysite.

Hutchinsonite.[1]		Dufrenoysite.[2]		Rathite.[3]		Fibrous Mineral.			
Form.	Angle.	Form.	Angle.	Form.	Angle.	Crystal 1.	Crystal 2.	Crystal 3.	Crystal 4.
—	—	(041)	22° 12′	(410)	21° 18′	21° 47′	—	—	—
—	—	(072)	25 0	(720)	24 1	24 49	—	—	—
—	—	(052)	33 8½	(520)	31 57	33 7	—	—	—
(730)	35° 0½′	(073)	34 58½	—	—	34 12	—	—	—
(120)	39 15	(021)	39 13	(210)	37 56	38 53	—	38° 35′	—
(320)	47 27	(032)	47 25	(320)	46 6	47 11	—	47 20	47° 27′
						47 20	—	47 25	—
—	—	(043)	50 45½	—	—	—	—	51 1	49 49
(540)	52 35½	(054)	52 33½	—	—	52 7	—	—	—
(110)	58 32	(011)	58 30½	(110)	57 19	58 19	58° 14′	58 28	58 12
						58 20	58 21		58 31
							58 51		
(340)	65 21	(034)	65 19½	(340)	64 18	—	—	64 56	—
(120)	72 59½	(012)	72 58	(120)	72 13	72 50	72 43	72 44	72 57
						73 0	72 54	72 48	
							72 55		
(140)	81 18	(014)	81 17½	(140)	80 53	80 17	—	—	—
—	—	(016)	84 10	—	—	—	—	84 32	—
(010)	90 0	(001)	90 0	(010)	90 0	—	89 32	—	—

Chemical Analysis.

The mineral (0·6730 gram) was decomposed in chlorine, and the constituents were determined in the usual way. Sulphur was determined on a separate portion, weighing 0·2666 gram. The presence of

[1] Mineralogical Magazine, 1907, vol. xiv, p. 287.
[2] Ibid., 1902, vol. xiii, p. 166.
[3] Ibid., 1912, vol. xvi, p. 197.

thallium is interesting.[1] The results of the analysis are given in the following table, and for comparison the percentages required for the formula of rathite, viz. $3PbS.2As_2S_3$, are added.

	Fibrous Mineral.	$3PbS.2As_2S_3$.
Pb ...	51·11 ...	51·36
Ag ...	0·76 ...	—
Cu ...	0·10 ...	—
Tl ...	0·23 ...	—
Fe ...	0·21 ...	—
As ...	23·37 ...	24·79
Sb ...	0·74 ...	—
S ...	23·22 ...	23·85
Insoluble ...	0·24 ...	—
	99·98 ...	100·00
Sp. gr. (D_4^{18}) ...	5·453	

[1] Compare A. Brun, Bull. Soc. franç. Min., 1917, vol. xl, p. 110.