NOTE ON A WEATHERED MINERAL

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An interesting specimen of a weathered mineral was obtained sometime back from the field. It has been examined and significant preliminary observations are recorded here.

The mineral is white and massive with silky fibres. The mass is covered by a hard skin on the outer surface. There were several minute black particles which were found scattered over the mineral. The mineral was easily fusible and hardness was found to be 1–1·5. The specific gravity of the specimen was 1·74. It was soluble in water leaving some siliceous residue; the taste was bitter and saline.

Analysis revealed that the mineral had aluminum, magnesium, iron, silica and sulphate with sodium and chlorine in traces. A fairly average gross sample was dissolved in dilute hydrochloric acid and the residue filtered and estimated as SiO_2 in the standard manner. From the filtrate Al, Mg and SO_4 were determined in the usual way. The mineral was dehydrated upto 200° C. and also ignited over a low flame. The loss in weight was taken as water. The results are shown in Table I below in percentages:

TABLE I

Insolubles	0·406
Al	6·993
Mg	3·255
SO_4	44·630
H_2O	44·890

To arrive at the constitution of the silky crystals, they were freed from the black particles as far as possible and separately analysed for the constituents. The results are recorded in Table II in percentages. The water-insoluble residue was taken from another sample and washed thoroughly with water to remove soluble salts. The residue was analysed completely and the results shown in Table III are expressed as percentages in the residue.

TABLE II

Al	6·365
Mg	3·113
SO_4	45·160
H_2O	45·320

TABLE III

SiO_2	73·59
Fe_2O_3	21·12
MgO	5·98

It can be seen from the analysis that the mineral is a hydrated sulphate of aluminium and magnesium with some impurities. The specimen is all the more interesting because, as far as the author could see, there are no recorded observations of this mineral in this country. Alum shales are known to occur in several places. In these shales, in unfrequented localities, silky fibres of magnesium sulphate and fibrous alunogen have been noted.[1] It is known that pyrites decomposition generally contributes to the formation of alum[2]; but the double sulphate of aluminium with magnesium has not been met with in the shales. However, Dana[3] mentions a mineral called Pickeringite of the composition $MgSO_4.Al_2(SO_4)_2.22\,H_2O$ as found in Chile, New Mexico and Nova Scotia. It is reported that the mineral is formed by the weathering of the pyrite-bearing schists in the same manner as the other members of the alum group, with which it is frequently associated. The analytical data presented in Table II agree well with the calculated percentages for $MgSO_4.Al_2(SO_4)_3.22\,H_2O$. Hence it is possible that the mineral found may be akin to Pickeringite. Further work on the detailed examination of the mineral and its mode of formation is under way and details will be published elsewhere.

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REFERENCES

1. *Records Geol. Surv. India*, 1910, **40**, 271.
2. *Ibid.*, 1906, **36**, 313.
3. *A Text-Book of Mineralogy*, New York, 1947, p. 764.