REFERENCES

Bonev, I. (1982) In *Excursion Guide (Central Rhodopes)*, p. 22. 13th General Meeting of IMA, Varna, Bulgaria.
Craig, J. R. (1967) *Mineral. Deposita*, **1**, 278–306.
Fleischer, M. (1958) *Am. Mineral.* **43**, 1221–2.
——(1983) *Glossary of mineral species.* Mineral. Rec. Tucson. 192 pp.
Harris, D. C., and Chen, T. T. (1976) *Can. Mineral.* **14**, 194–205.
Kostov, I. (1958) *Mineral. Mag.* **31**, 821–9.
—— and Minceva-Stefanova, J. (1981) *Sulphide Minerals.* Bulg. Acad. Sci., Sofia.
Kupcik, V., Franc, L., and Makovicky, E. (1969). *Tchermaks Mineral. Petrogr. Mitt.* **13**, 149–56.
Mumme, W. G., and Watts, J. A. (1976*a*) *Can. Mineral.* **14**, 322–36.
——(1976*b*) Ibid. **14**, 578.
Nechelyustov, G. N., and Lebedev, V. S. (1967) *Dokl. Akad. Nauk SSSR*, **174**(3), 679–82 (in Russian).
Otto, H. H., and Strunz, H. (1968) *Neues. Jahrb. Mineral. Abh.* **108**, 1–19.
Salanci, B., and Moh, G. H. (1969) Ibid. **112**, 63–95.
Takeuchi, Y., Takagi, J., and Yamanaka, T. (1974) *Z. Kristallogr.* **140**, 249–72.

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The identification of two fibrous sulphosalts from l'Etacq, Jersey

IN 1911 or 1912 wulfenite was discovered by Teilhard de Chardin and Pelletier (1921) at l'Etacq, Jersey, accompanied by some other minerals. The first published account of the discovery is by Lacroix (1913) who states: 'Iles anglo-normandes—Jersey. Je dois au P. Pelletier un échantillon de quartz d'un filon qui traverse le granite de l'Etacq; il renferme de la molybdénite; il est creusé de géodes, renfermant, les unes des aiguilles de stibine ferrifère, et les autres des cristaux blancs de wulfénite ($b^{1/2}$ $\frac{1}{2}$ h^5, avec souvent en outre p(001), soit à peine indiqué (fig. 1), soit prédominant). L'intérêt de cet échantillon est de montrer l'association de la molybdénite à la wulfénite, occupant la place de galène disparue.'

We have, however, Teilhard de Chardin's contemporary account of the identification of these minerals in the following extracts from two hitherto unpublished letters addressed to Pelletier:

13, Rue du Vieux-Colombier (Paris 6)
13 Octobre 1912

Je passerai demain au laboratoire de Minéralogie pour avoir vos déterminations et vos échantillons (on m'y a fait allusion, donc ils ne sont pas jetés) . . . Lundi soir—j'ai passé ce matin au Laboratoire de Minéralogie:

a) On m'a dit que vos échantillons étaient classés et *catalogués*; cela m'a enlevé tout moyen de les redemander, en tout ou en partie.

b) Il y a dans ces échantillons: de la wulfénite, comme vous saviez, et de la stibine (ferrifère); M. Lacroix ne m'a fait allusion à rien d'autre. Il m'a seulement dit que l'association wulfénite et Pb-Molybdénite (apparente) était intéressante. Il a mis quelques lignes là-dessus dans la nouvelle édition de la Minéralogie de la France (sous presse). En général, quand on trouve la wulfénite, les minéraux qui lui ont donné naissance ont complètement disparu. — Cela fait tout de même deux choses nouvelles pour Jersey, à moins que ce que nous avons baptisé mispickel aciculaire (Prelec) fut déja de la stibine.

Louvain, 1er Janvier 1913.

D'abord je vous avouerai que je n'ai pas osé insister encore près de M. Lacroix pour faire reviser l'analyse de la pseudo-stibine de l'Etacq; mais à l'occasion j'en glisserai un mot.

It is obvious from these letters that Teilhard de Chardin was doubtful about Lacroix's identification of stibnite (stibine, Sb_2S_3). Eight years later, Teilhard de Chardin and Pelletier (1921) published

their final account of two of these minerals, as follows:

PLUMOSITE. SULFOANTIMONIURE DE PLOMB

En aiguilles cristallisées gris d'acier, ou plus souvent en masses fibreuses brillantes. Fusibilité 2. Dureté 2,5.

A l'Etacq, carrière nord-ouest.

Un filonnet granulitique en contient un peu, mais moins qu'une veine quartzeuse verticale du nord-ouest de la carrière et où l'on trouve aussi de la wulfénite.

WULFENITE. $PbMoO^4$ [*sic*]

En petits cristaux bien nets tirant sur le jaune miel et déterminés par Mr. Lacroix.

Carrière nord-ouest, l'Etacq.

'Plumosite' is a synonym of boulangerite ($Pb_5Sb_4S_{11}$) and is, of course, correctly described as 'sulphantimoniure de plomb'. It should be noted that plumosite is said to occur in two places in the quarry. There was a specimen labelled 'plumosite' in the Jesuit Fathers' collection in Jersey, which I saw in about 1935, and there was almost certainly also one of wulfenite, but these have both been lost (Mourant, 1984).

I therefore recently contacted Professor J. Fabriès, the successor of Professor Lacroix at the Muséum d'Histoire Naturelle, who informed me that the Museum did possess a specimen from l'Etacq (no. 112 599) labelled as containing wulfenite, molybdenite, and stibnite (stibine) in a quartz vein. He subsequently very kindly arranged for the antimony mineral to be examined by Mme. M. Pinet to whom I am indebted for the following report:

Donnant suite à la correspondance que vous avez eu avec Monsieur le Professeur Fabriès, j'ai repris l'étude de l'échantillon de wulfénite, provenant de Jersey, numeroté 112 599 dans la collection de minéralogie.

L'étude des fins cristaux aciculaires disposés dans les géodes du quartz, montre qu'il s'agit de boulangérite, comme le confirme d'ailleurs très nettement les rayons X.

It has thus been established that the dark grey fibrous mineral accompanying wulfenite is boulangerite.

However, in the 1930s I had collected a specimen of a dark grey fibrous mineral at l'Etacq, in the same quarry as the boulangerite and other minerals mentioned in this paper. From its superficial resemblance to the Jesuits' 'plumosite' specimen, now lost, I identified it as plumosite. It is accompanied by quartz, molybdenite, and chalcopyrite, and is in the Société Jersiaise geological collection, reference number SJMC 2038.

However, when I wrote 'The minerals of Jersey' (Mourant, 1961) I unfortunately mistranslated 'plumosite' as 'jamesonite', the name of a mineral which contains iron as well as the lead, antimony and sulphur of plumosite or boulangerite. Under the heading of jamesonite I included both Teilhard de Chardin and Pelletier's 'plumosite' and the mineral which I had collected.

When the above mentioned errors had come to light and been corrected as far as possible I thought it best for the Société Jersiaise specimen to be further examined, confidently expecting it to prove to be boulangerite. Dr C. J. Stanley of the British Museum (Natural History) reports that the black acicular mineral is in fact cosalite ($Pb_2Bi_2S_5$),* containing not antimony but bismuth, silver, and copper. It was identified by electron microprobe analysis and confirmed by X-ray diffraction. The X-ray powder diagram is quite distinct from that of boulangerite.

It is thus clear that at l'Etacq, and within the one quarry, there are, or were, two distinct dark fibrous sulphosalts, boulangerite and cosalite. It must be considered possible that the Jesuits' material, now all lost, included both minerals.

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REFERENCES

Lacroix, A. (1913) *Minéralogie de la France* Librairie Polytechnique, Paris, **5,** 85.

Mourant, A. E. (1961) *Ann. Bull. Soc. Jersiaise*, **18,** 69–90.

——(1984) Ibid. **23,** 387–90.

Teilhard de Chardin, P., and Pelletier, F. (1921) *Bull. Ann. Soc. Jersiaise*, **9,** 293.

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* The electron probe analysis gave an analysis close to the formula $(Cu,Ag)Pb_9Bi_{10}S_{25}$.