

A MINERALOGICAL TRIP IN FRANCE

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When I was ordered to Beaune and was placed in charge of teaching the mineralogy there, in the American Expeditionary Forces University, there were no minerals and no text-books available for the class. Some "Lefax" folders (9-22 and 9-48) arrived by first-class mail before we finished, however; and owing to the kindness of M. A. Changarnier, Officer of Public Instruction and Conservator of the fine Museum at Beaune, and of Prof. J. Blagac, of the University of Dijon, who presented and loaned to us an extensive series of minerals, including some fine specimens, we were able to get along. I also obtained a set from Stuer of Paris, who is to France what English of Rochester is to this country, before we left. Practically no government requisitions came thru in the brief three months of the existence of the Beaune university. There was therefore a fine chance to illustrate makeshifts, such as a blowpipe made of two clay pipes; a lens used as a burning glass to test fusibility; broken porcelain electric fixtures as streak plates; etc. But great emphasis was naturally laid on physical characters, and especially the associations, *i.e.*, the paragenesis of the minerals. By using specimens that had several minerals on them, we did not need to borrow so many; and as every mineralogist knows, the association of a mineral as for instance staurolite with metamorphic rocks, is a thoroly reliable means of identifying it. We were located near enough to five different kinds of mines to reach them on our excursions. Beaune, located on the edge of the Jurassic limestones, and of the deposits of a Pliocene lake, and within a few miles of both the coal measures and the granites of the Morvan district, was not a bad place for our work.

Perhaps the most interesting excursion, and one which I can recommend to any mineralogist who finds himself in that neighborhood, is to the fluorite mine of La Petite Verrière, owned by the Mayor, M. P. de Champeaux, who was extremely courteous to us. This mine is within sight of the tramroad running from Autun to Chateau-Chinon, $12\frac{1}{2}$ kilometers northwest of Autun (lat. 47° N., long. $4^{\circ} 15'$ E.). The dumps of this mine are so brilliant they might almost be considered fluorescent, and are

the prettiest I have ever seen, a most beautiful pink, and white with a green hue. The vein occurs in a granite porphyry, and strikes N.N.E., dipping at 66° E.

The normal color of the fluorite in the vein is very light, pure green. Next to it, in order of age, is a white chalcedonic silica, in narrow seams, almost like Arkansas novaculite in appearance. This fluorite, which forms the bulk of the vein, is cut by obviously later veins of fluorite, more of a sea green in color, with a slightly violet hue. Truly violet fluorite is rare, and I am inclined to think is the result of secondary changes, perhaps corresponding to that which takes place when greenish glass is colored violet by exposure to the sun. Crystals are infrequent, but I found a few cubes. The later veins are also often bordered by chalcedony.

Next in order of age comes barite, which is of white or flesh color, and occurs at the combs of the secondary veins in tabular forms such as are common with this mineral, grouped together in such a manner as to suggest the carved wooden fur on certain Noah's Ark animals of my boyhood days. The barite crystals were sometimes covered by small quartz crystals, and occasionally by larger ones. A few specimens showed quartz of a beautiful golden hue, due to a film of limonite, the last mineral deposited. The barite is deleterious to the use to which this fluorite is put—the making of steel at the famous Schneider's works at Le Creusot, not far away—so it is picked out, and there are quantities of it, including fair crystals, on the dump.

In the rather brief visit we were able to make no particularly rare minerals were found, but we took some fine large pieces of the usual ones, above described, and it is hoped that they will ultimately reach the U. S. National Museum. The whole deposit was strikingly and remarkably free from sulfide minerals, which was of course an important consideration in connection with its use in steel manufacture. The deposit is a good illustration of the association of fluorite with granitic rocks, and some interesting mineral associations might be found by someone who could spend a longer time there.

After the term I visited the Auvergne, with its wealth of zeolite minerals. Here Clermont-Ferrand is the best headquarters, there being at hand a University, and the Professor of Geology there, M. Ph. Glangeaud, has written both an exhaustive monograph and a pamphlet guide upon the region. The University collections are well worth a visit, as is also that of the mineral dealer, M. Demarty.