

Note on a Zircon from Expailly, Haute Loire.

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THE great variation which occurs in the specific gravity of zircons seems to render it possible that the presence of fluid and gas inclusions might, to some extent, account for this. A small, partly red, partly colourless crystal was selected from a number of others all derived from the Riou Pezzoliou, Expailly, near Le Puy, which, when examined under the microscope, was found to contain numerous inclusions, some with, others without bubbles.

The crystal weighed 0.155 gram, and its specific gravity was found to be 4.843.¹

Dana gives 4.863 for a crystal from the same locality, or .02 more than the specific gravity of the crystal here described, which shows the common combination (111), (110). The inclusions lie some little distance beneath the surface of the crystal. They are frequently delicate anastomosing tubes, the same tube often varying in diameter, being apparently inflated at one spot and drawn out finely at another. Their length is rudely parallel to the principal crystallographic axis. When of very small diameter they sometimes appear perfectly black, owing to total reflection.

The borders of the inclusions are, in some cases, very broad and dark, owing to the high refractive index of zircon compared with that of the contents of the cavities. The cavities with very broad dark borders may contain gas. This seems the more probable since, in the opinion of Fouqué and Lévy, zircon results from a process of sublimation rather than from dry fusion. In some cases the cavities appear to be completely filled with liquid, but in most cases bubbles are present, which undergo gradual change in dimensions when the crystal is heated. No bubbles within bubbles, such as occur when liquid and gaseous carbon dioxide are both present in the same cavity, are to be detected under the microscope, and no sudden change is to be noted in any of the inclusions

¹ The pycnometer was used, and, the weather being exceptionally hot, the water was at a temperature of 79° F.

when heated to the critical point of carbon dioxide. The liquid inclusions may, therefore, consist of water only. Glass inclusions may also be present, especially in those cases where more or less fine dusty matter occurs, but the high refractive index of zircon, as pointed out by Rosenbusch, renders any precise determination of the nature of these inclusions difficult.

The almost spongy texture imparted to portions of the crystal by the presence of the minute cavities here described is, I think, sufficient to account for a somewhat lower specific gravity than that met with in other crystals of zircon from the same locality, although it by no means follows that variation in specific gravity can in all cases be referred to the presence of inclusions in this mineral.
