

## NOTES AND NEWS

### DISCUSSION OF "NOTES ON QUARTZ DIKES"

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Mr. Furnival, in his paper "Notes on quartz dikes" published in this issue of *The American Mineralogist*, summarizes pertinent data on large quartz masses.<sup>1</sup> He concludes that:

"No occurrence of a body of quartz which has undoubtedly formed by the action of magmatic processes, that is by direct crystallization from an igneous magma, has been described in geologic literature."<sup>2</sup>

Assuming that relatively pure quartz masses are meant, I am in complete agreement with this statement. However, in the repeated references made to an earlier paper by me on this subject,<sup>3</sup> I consider that my views expressed in that paper have been seriously misinterpreted. I wish to take this opportunity to point out these misinterpretations because by them certain ideas, which I did not hold then and do not hold now, are incorrectly ascribed to the article.

The general impression conveyed by Furnival's paper is that I ascribed an igneous origin to pure or relatively pure quartz masses. This I was careful not to do for my belief was at that time, and always has been, that such igneous quartz masses did not exist. The aim of my paper as set forth in the introduction<sup>4</sup> was to give the most objective review possible of the literature of "quartz masses *that are thought by the investigators or other persons to be of igneous origin*" with the object of ascertaining "if there are any features in their mineral composition or manner of occurrence that might be of diagnostic value in interpreting their origin." The first part of the foregoing quotation, with the exception of the words that I have italicized, was quoted by Furnival in the first sentence of his article. By the omission of the phrase "by the investigators and other persons" the incorrect implication is conveyed that the quartz masses reviewed were thought *by me* to be of igneous origin.

My ideas on the possible occurrence of quartz masses are adequately expressed, I think, in the following quotation from the second paragraph of my paper.<sup>5</sup>

<sup>1</sup> Furnival, G. W., Notes on quartz dikes: *Am. Mineral.*, **24**, 499-507 (1939).

<sup>2</sup> *Op. cit.*

<sup>3</sup> Tolman, Carl, Quartz dikes: *Am. Mineral.*, **16**, 278-299 (1931).

<sup>4</sup> *Op. cit.*, 278-279.

<sup>5</sup> *Op. cit.*, 278

"It is obvious that a pure silica magma would not be possible. The melt would be of a highly viscous nature and would have a high temperature of consolidation, namely 1713°C. due to the lack of other constituents whose presence would cause a mutual lowering of the melting point. There is no evidence of such a high temperature at the time of emplacement."

May I also quote a parallel statement from the second paragraph of Mr. Furnival's paper.<sup>6</sup>

"Physical-chemical grounds alone seem to preclude the possibility of quartz masses forming by direct crystallization from a melt. Pure silica has a melting point of 1713°C. so that existence in nature of molten silica seems highly improbable, and even were it possible its high viscosity would make injection unlikely."

Thus the same idea is expressed in the two quotations, namely, that quartz masses resulting from the consolidation of a pure silica magma are highly improbable, if not impossible, and further I think that the quotation from my paper is the more emphatic about the matter. Yet no allusion to my expression of this generally held idea is given in Mr. Furnival's paper. Rather it is the implication of the first three paragraphs of Furnival's paper that I held a contrary idea.

Further, in my article, I do not point to a single quartz-rich mass described in the literature reviewed, that I considered to have been shown to be of direct igneous origin.

Yet Furnival<sup>7</sup> discusses certain quartz masses that are discussed in my paper and states that I considered them "quartz dikes" (Foxdale, Isle of Man) or "of igneous origin" (Salem, India).<sup>8</sup> Also, in his discussion of quartz masses described by Baumgartel, Furnival<sup>9</sup> concludes that I was not justified in including them as "igneous quartz masses." It is true that, as my article was a critical review of the literature, I grouped them with some others that were considered by the *investigator concerned* to be igneous quartz masses. But in my discussion and in my conclusion, I stated repeatedly<sup>10</sup> that I thought the evidence of an igneous origin for Baumgartel's quartz masses was inconclusive. These statements are ignored by Furnival.

Numerous quartz masses described in the literature by the authors of different articles reviewed as grading into pegmatite veins or dikes, or

<sup>6</sup> *Op. cit.*, 499.

<sup>7</sup> *Op. cit.*, 499.

<sup>8</sup> *Op. cit.*, 287.

<sup>9</sup> *Op. cit.*, 500.

<sup>10</sup> *Op. cit.*, 295-297.

other related igneous rocks were discussed in my article. The opinions of each investigator as to hydrothermal or igneous origin of the quartz were given. Furnival<sup>11</sup> discusses some of the same occurrences and refers to a number of them as having been cited *by me* as of igneous origin. In this connection I quote from the concluding paragraph of the section of my paper concerned with these occurrence:<sup>12</sup>

“It seems, then, from the observational evidence available in the literature it must be taken as proved that quartz masses grade into pegmatites, aplites or like rocks which in turn grade into typical igneous rocks. But in arriving at this conclusion we have not in any way determined if any of the quartz masses represent the solidification of an igneous magma.”

Furnival<sup>13</sup> also cites certain large quartz masses, in South Africa, western Massachusetts, and Eskdale, England, that were discussed by me and concludes in his summary<sup>14</sup> that:

“The evidence regarding large masses of quartz cited by Tolman as of igneous origin is inconclusive.”

In my article I fail to find any statement that indicated that I considered such evidence anything other than inconclusive. Having admitted in the body of my paper that we do have pure quartz masses considered of hydrothermal origin and that we do have quartz-rich igneous rocks of one kind or another and, further, in accordance with prevailing petrologic conceptions the gap between these two occurrences would be bridged by quartz-rich bodies (supported by field evidence), the conclusions of my paper were concerned with *possible* features of these quartz rich bodies that *might* indicate an igneous origin.

<sup>11</sup> *Op. cit.*, 503.

<sup>12</sup> *Op. cit.*, 292-293.

<sup>13</sup> *Op. cit.*, 501.

<sup>14</sup> *Op. cit.*, 505.