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It is commonly supposed that when veins | quite im cease upwards at the conformable or unconformable line of contact of two formations or rockmore e: masses, this circumstance is in itself a proof that ploratio such veins were formed during some period I hope t antecedent to the deposition of the superior and occasior younger formation, and doubtless such is frequently the case; but it is, I conceive, by no

means an axiom, and should always be applied From with caution ; inasmuch as it is not only possible, crossing but even probable that conditions favor ble for Scotia ( the formation of openings, cracks and fissures, tinnous and the introduction of minerals into them, may visiting have affected the sediments of one formation, the cor without operating beyond its limits, either upwards or downwards, in rocks which differed greatly in physical and mineral characters, as Guyshe Moutar Musqu well as in geological age.

## AGE OF AUSTRALIAN VEINS.

On t I have elsewhere pointed out certain reasons Scotin. for supposing that quartz veins differing greatly in age and in mineral contents, but hardly, if at examin Provin via W. all, distinguishable by external characters from ton. S each other, occur in the metamorphic and slaty Silurian rocks of the Australian gold-fields. Mr. Ovens W. P. Blake, in quoting my remarks on this via Ne subject in his elaborate and comprehensive report down. on the precious metals, adds : " This fact is a ing, vi familiar one to American quartz-miners, not only as olis in California, but in the Appalachian gold-fields, and it suggests the possibility of their being enable a gen quartz lodes of two or more distinct periods in America as in Australia." (Reports of the United States Commissioners to the Paris Universal Exposition, 1867. Vol. II.) geolog the go me to count

## THE GOLD-STREAK.

The distribution of the gold in "streaks," "pipes" or "pay-chimneys" in the quartz-veins is a feature common to Nova Scotia, to Australia, and to California. These streaks are always found to have a dip more or less transverse to the dip of the vein; they sometimes vary greatly in width at different depths on the course of the vein, and are therefore more or less lenticular or wedge-shaped, not unfrequently dying out altogether before reaching the surface. In some veins they are stated to occur at no great distance apart, while in others they are separated by great thicknesses of comparatively barren quartz. Thus in following the veins downwards, if the streak happens to be narrow, it is speedily passed through, and the sudden im-poverishment of the quartz causes a mine to be abandoned, when by a little further exploration in the direction of the dip of the streak a very different result might have been obtained. At present there is not much reliable information on present there is not much reliable information on this subject, though it is one well deserving of closer investigation. Prof. H. Y. Hind in his "Renort on the Wayerley Gold District," gives a number of interesting facts concerning it, and states that at Sherbrooke, in some mines the gold streas on the south eide of the anticlinal dips to the east at a high angle, and on the north side to the vest at about the same angle; and at Waverley, that the streak in the North lead dipped from west to east, and in the North Taylor, South Taylor and Ro. 6 leads. diment Taylor, South Taylor and No. 6 leads, dipped

from cast to west. The above leads are all on the morth side of the anticlinal.

As regards the mines at Sherbrooke above cited, unless the leads or layers of quarts to which the observations refer have been proved undoubledly to be parts of the same bed on either side of the axis, very fittle can be deduced from the facts recorded. On the other hand, if it could be proved that such a reversal of the dip of the gold streak always occurred on the opposite sides of the anticlinal, in quartz layers which had been proved to be identical by being traced continuously round the end of the axis, then indeed we should have the strongest evidence, if not of the quartz layers having been actually deposited at the surface at the same time as the slaty and arenaceous rocks of the country, at least of their having been formed, and the gold distributed in them in bands, in the manner in which it is now found, antecedent to the operation of the forces by which the main anticlinal and synclinal forms of the strata were produced.

## INTERSTRATIFIED BEDS .- EMMONS, SILLIMAN.

The theory above alluded to, of the contemporaneous origin with the enclosing strata of certain gold-bearing bands in North Carolina, is advanced by the late Professor Emmons in his report on the Geology ot that State, published in 1856; and as early as 1837 Professor B. Silliman seems, from the following extract from his " Remarks on the Gold Mines of Virginia, (American Journal of Science, vol. xxxii, page 100,) to have held a similar view regarding some of the gold-lodes of that region. He says : "The auriferous or gold-bearing quartz of the gold-region of Virginia (and as far as I am informed of the States further south), form not strictly veins, but rather beds or layers, in general not interfering with bat conforming to the regular structure of the slaty rocks of the country, and like them descending to an unknown and probably an unfathomable depth. . The quartz is therefore as regular a part of the structure of the country as the slaty rocks them-selves, and when it is auriferous, the gold is disseminated through it in spangles, flakes and points, sometimes visible on breaking the quartz, but most usually entircly invisible even with a gold being generally disseminated in the quartz of this gold-region it is obvious that it must have been laid by in its stony bed at the same time that the quartz and the slate rocks in which it is contained were deposited." The manner in which the gold is disseminated in the quartz, cannot be considered as affording any evidence on this point, because it is as common in true veins which intersect the stratification, as it is in the bedded voins above described.

## HUNT, HIND.

Dr. T. Sterry Hunt, Mr. Hind and other writers, express views respecting those auriferous quartz lodes in Nova Scotia, (which have been found to be more or less parallel with the stratification of the country, both in strike and dip,) agreeing with those ot Prof. B. Silliman in Virginia and Prof. Emmons in North Carolina. A similar mode of occurrence of quartz layers

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