

THE LAWS OF PHYSICS.

PROFESSOR C. R. VAN HISE, in his excellent address on the training and work of a geologist (*SCIENCE*, August 29), criticises the spiritualistic views of Dr. A. R. Wallace (p. 333) on the ground that they show an ignorance of physical laws. If Professor Van Hise were more familiar with Dr. Wallace's writings, he would know that that naturalist is no mere biologist, but is well acquainted with the currently accepted laws of physics. If he should remain unconvinced of this, he could not say that Professors Crookes and Oliver Lodge, who hold similarly heterodox opinions, are not familiar with the principles of physics! It seems to me that Professor Van Hise might just as well have claimed that believers in magnetism were unacquainted with the laws of gravitation.

Some years ago I had the pleasure of discussing these matters with Dr. Wallace, and in my innocence I ventured to ask if he had sufficiently considered the laws of physics, and so forth. I can recall his smile as he said that of course he had considered them, and then went on to say that all phenomena were equally natural and in accordance with natural laws, only some had received a theoretical explanation, while others had not.

Dr. Wallace's views may or may not be absurd, but it seems clear that Professor Van Hise's criticism is without justice or validity.

T. D. A. COCKERELL.

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LICHENS ON ROCKS.

TO THE EDITOR OF SCIENCE: A few days ago, I visited a point along Chicago Creek near Idaho Springs, Colorado, and on examining the massive rock (gneiss) to ascertain the cause of the apparent weathering, I found the rocks literally covered with lichens of a uniform black color.

My observations were made in the vicinity of an abandoned tunnel site, in fact at the entrance, and while standing on the 'dump' my eye fell upon a piece of porphyritic rock which proved to be covered with arborescent figures closely resembling the imprint made by the lichens observed on the rocks above.

My first impressions were that the figures were simply those characteristic of 'dendrites,' but on further examination and reflection I discovered that the deposit on my specimen was upon the surface of a conchoidal fracture, the latter being evidently the result of a shot made prior to the removal of the rock from the fissure vein, and consequently the arborescence could not be the result of the infiltration of a mineral solution along a cleavage plane or fissure, which is generally supposed to be the cause of such deposits.

This conclusion was seemingly corroborated by a discovery made a few moments later on the opposite side of the cañon and at the base of another mountain. Here I found a magnificent hand specimen of porphyry which was evidently derived from a porphyry dyke which I know to be located several hundred feet above the creek. The entire surface of the specimen which had been exposed to the light was covered with beautiful forms of lichens of a brown, green, gray and black color, brown and green predominating.

The ground or main mass of the porphyry, consisting of a beautiful brown color in which were embedded the crystals of feldspar, led me to think that perhaps the differentiation in the color of the lichens was due to the mineral content of the underlying constituents of the rock; for the greater percentage of the browns were found growing in the brown main mass. Here was also evidenced their corrosive and etching effect upon the rock, the black lichens being evidently in a state of decomposition; their corrosive and penetrating effect was also quite apparent upon the massive rocks, resulting in beautiful arborescence similar to that found in the specimen first alluded to above.

I might add that the specimen was considerably mineralized, iron pyrites being disseminated throughout and readily observed by the naked eye. The presence of this accessory together with that of the essential oligoclase which might possibly contain manganese as one of its constituents leads me to ask, first, whether either one or both of these minerals could have influenced the color of the plant during life, second, whether the arborescence