

EXPERIMENTS WITH AND PHENOMENA OF VACUUM TUBES. By R. A. FESSENDEN.

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THE ELECTRO-MAGNETIC INERTIA OF A LARGE MAGNET. By THOS. GRAY.

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SOME NEW ELECTRICAL APPARATUS. By R. A. FESSENDEN.

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ON THE CONSTRUCTION AND USE OF A BOLOMETER. By B. W. SNOW.

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ROTARY BLOWERS. By JOHN T. WILKIN.

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AN INQUIRY AS TO THE CAUSE OF VARIETY IN ROCK DEPOSITS AS SEEN IN HUDSON RIVER BEDS AT RICHMOND, IND. By JOSEPH MOORE.

Take a depth of our bed rock at this place of, say fifty feet, along the river channel. The variations in the lithological character of the numerous sharply defined layers is very marked and very many times repeated; not more so, however, than in hundreds of other localities throughout the country at the same or at other horizons. Here the well solidified portions are thick-bedded (the layers say a foot thick) while not far below or above they are thin, say one or two inches. These consolidated layers vary in texture and composition, some of them being nearly pure limestone and sufficiently crystalline to take a fair polish. Others are masses mainly of brachiopods, often well preserved and matted together with clay or with lime and iron from a state of solution. Others still are shoals of commingled sand, clay and lime and almost destitute of fossils. Then there are the intercalated beds of clay with sufficient calcium carbonate to effervesce with acids for a little while, but leaving their principal bulk when the solvent has done what it can. These beds of finest grained clay vary in thickness from a very few feet to a few inches and even to the thickness of ordinary paper. Often these clay deposits are entirely destitute of fossils and again they are the hope of the hunter of trilobites and a few other form that may be found therein. All these features are familiar to the observer in various localities.

But the commonness of the phenomena does not make their causes the less desirable to seek. It can hardly be supposed that the ocean varied in

depth so many hundred times as would be necessary to produce all the variations to be read in a thickness of five hundred feet. Pure limestones are made in the deeper waters and fine argillaceous sediments may settle in the deeper or the shallower places.

But there appears to be ample reasons for believing that the sea in which the Hudson River rocks of Indiana and Ohio were deposited had its shore line far away, or in other words, said localities were near the middle of a continental ocean.

How then can we account for such well defined successions of mechanical deposits for so long a period of time? How could these sediments get so far from shore and how could they recur so sharply bounded as they are from the purer limestone and other consolidated ledges? How came it about that there were such numerous alternations of life and death epochs in the same fifty, or five hundred feet? The answer to these questions may be very easy to some geologists. We have not, however, seen them satisfactorily answered. Their solution, whatever it is, will be the opening of a door to other secrets.

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THE TRAPS OF REDHEAD, N. B. By V. F. MARSTERS.

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EXHIBITION AND EXPLANATION OF A GEOLOGICAL CHART. By ELWOOD P. CUBBERLY.

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GLACIAL AND PREGLACIAL EROSION IN VICINITY OF RICHMOND, IND. By JOSEPH MOORE.

Richmond is on Drift, underlaid by upper layers of Lower Silurian known as rocks of the Hudson River Group. These rocks being of the earlier time have been above the sea for ages. Consequently there was plenty of time for them to be much eroded. I shall not in this brief paper specify all the well-marked features of erosion but will allude to a few special examples. There is a buried river channel a few rods west of the present channel of Whitewater. This was reported nearly fifty years ago by Dr. Plummer, of Richmond, but it was not then so well known in its extent and direction as it has since become by means of wells, tile layers and ditches for water and gas mains. Said buried channel is about seventy feet wide where crossed by the national road and its walls are very