

formed and it concentrates around the dust particles and falls in a rain of mud. The reports show that the mud fell, not near the crater, but along the lower part of the mountain.

As soon as the outrushing hydrogen could combine with the oxygen of the air to form water, an immediate contraction followed. A vacuum was formed extending over areas in proportion to the volume of hydrogen ejected, and combined with the atmosphere. Hurricane phenomena on a gigantic scale were at once witnessed. Trees were uprooted and the walls of houses were pulled outwards. The clothes of the victims were torn off. The garments had acted like the screens on the Davy safety lamp—they had prevented the air between body and clothes from combining with the hydrogen, but as soon as the vacuum caused by the combination on their exterior took place they were exploded and torn off by the contained air. The extensive vacuum thus formed might also account for the sudden death of the victims, the instantaneous removal of the atmospheric pressure causing cerebral hemorrhage and paralysis. Autopsies upon the bodies of the victims would have determined the immediate cause of death. If none have been made they might still be made where the bodies were well covered.

In the absence of other demonstrable causes the tidal wave may also be accounted for on the same theory.

ROB'T H. GORDON.

CUMBERLAND, MARYLAND,

June 7, 1902.

SHORTER ARTICLES.

BLACK RAIN IN NORTH CAROLINA.

THE 'famous black rain,' so-called by the natives, fell at Louisburg, N. C., the morning of March 15, 1900.

A sample of the water which had been carefully collected came into our hands through the kindness of Professor M. S. Davis, of the Louisburg Female College. An analysis was made:

	Parts per Million.
Total residue.....	88.00
Loss on ignition.....	54.00
Non-volatile residue.....	34.00

	Parts per Million.
Chlorine	19.144
Oxygen consuming power—15 minutes..	1.93
Oxygen consuming power—4 hours....	2.64
Ammonia—free	.872
Ammonia—albumenoid	.04
Nitrogen as nitrates.....	.88
Nitrogen as nitrites.....	none.

About sixty per cent. of the residue was organic matter, largely soot. The chlorine content showed an unusual amount of sodium chloride. The non-volatile residue besides sodium and some calcium gave reactions for traces of iron, manganese, aluminum and zinc. The other constituents indicate ordinary rain water.

No especial phenomena were noted preceding or during the precipitation 'except an unusually black cloud and a heavy downpour of rain, accompanied by a darkness so dense as to necessitate the use of lamps for half an hour.' It had been raining for several days preceding this occurrence and the water collecting in pools out of doors showed a distinct and unusual black color. A number of samples were collected and held as a curiosity. After a few days the water became clear through the settling of a black sediment.

The situation of and amount of fuel burned in the place, as well as the time of the year, preclude accounting for the fluorescent black rain by local contamination, such as observed in numerous cases by Angus Smith and Phipson and lately by Irwin, who examined the snowfall in Manchester, England (*Journ. Soc. Chem. Ind.*, XXI, 533, 1902). While it is well known the unusual impurities in rain, snow, etc., often occur and the sources of contamination may be traced great distances, no opinion is hazarded as to the cause of this phenomenon. All such incidental observations deserve chronicling, as did the black snow which fell in Indiana in January, 1895 (*Monthly Weather Review*, 60, 19), the 'blood rain' reported by Passerine to have fallen at Florence in March of last year (*L'Orosi*, 24, 325), and the 'dust fall' in Europe the same month (reported by Hellmann and Meinardus).

CHAS. BASKERVILLE,
H. R. WELLER.

UNIVERSITY OF NORTH CAROLINA.