## LECTURES ON AGRICULTURAL CHEMISTRY.

NOTE 4.—Ammonia.—Put a small quantity of spirit of hartshorn (ammonia) into a spoon, and hold it over the candle; at the same time, heat some spirit of salt (muriatic acid) in another spoon, and blow the fumes of ammonia in the direction of the spoon containing spirit of salt. A dense white cloud will be formed immediately. Muriatic acid gas combines with ammonia, and forms the solid sal-ammoniac.

Pour some spirit of salt into a spoon, warm it over the candle or fire, and take it into a close stable : white fumes of sal-ammoniac will be formed. The ammonia in the stable proceeds from decomposing urine.

NOTE 5.—Carbonic Acid.—Pour strong vinegar upon some pieces of chalk or limestone. Violent effervescence will be observed, caused by the liberation of carbonic acid from its union with the lime of the chalk or limestone. If the chalk is at the bottom of a deep glass vessel, heavy carbonic acid will displace the air, and a lighted piece of paper being introduced, will be immediately extinguished.

NOTE 6.—Lime Water.—Pour rain water on newly-burned lime, decant the clear liquid, and breathe into it through a straw or tobacco pipe. The water contains dissolved lime, the carbonic acid of the breath combines with the lime, and forms chalk, (carbonate of lime, pure limestone) which renders the water milk-white. Continue breathing; after a time it will become clear again. The water absolbs carbonic acid as the air from the lungs passes through it, but water absorbing carbonic acid acquires the power of dissolving chalk, or pure limestone, hence the clearness of the liquid. The presence of lime at the ' tom of many kitchen utensils, arises from the heat to which ney are exposed driving off the carbonic acid from the water, which is thus rendered incapable of retaining lime in solution.

Note 7.—If a pint of water be converted into steam by heat, and the steam thus formed passed through five pints of water, it will raise the whole to the boiling point. From which it is inferred that the steam contains five times as much heat as the boiling water from which it was formed. When water  $eve_{P^{int}}$ rates slowly, it absorbs heat from surrounding bodies—hence evaporation always produces cold.

Note 8.-Hydrogen.-Introduce some iron turnings or bits of zinc into a small bottle. Make a hole through the cork and insert some the fo cork t of a m issuin by th and co imme place

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