

AN APPARATUS TO MEASURE THE VARIATIONS OF DAYLIGHT.

It is greatly to be desired that a good and simple method be found of recording and measuring, with some accuracy, the variations of daylight throughout the day. This would render the weather record more complete, and it has an important special bearing on plant physiology. An attempt of the kind has lately been made by a German, Herr Kreuzler, who has had made for him, by Liebertz, in Bonn, an apparatus with the following arrangement: It consists of a drum, fixed with its axis in the plane of the meridian, and adjustable so as to be at right angles to the sun's rays. This drum has its border divided into 24 hours—12 noon and 12 midnight being in the meridian plane. A strip of paper, sensitized with solution of bichromate of potassium, and having divisions which correspond to those on the drum, is placed round this. A second drum closely surrounds the first, and is turned by clock-work (from which it can be detached) once in 24 hours, in the direction of the sun's apparent course. The second drum has a slit for admitting light to the paper; its width is such that any point on the paper is exposed 20 seconds as the slit passes over. The whole apparatus is placed in the open air under a glass bell jar. Its arrangement gives little trouble; the paper strip has merely to be placed in its right position at night or under artificial shade (to avoid coloration), and the outer drum slid over and so attached to the rotating axis that the "insolation slit" is opposite the hour then present. The slit then begins to move round the inner drum correspondingly to the sun's course. The impressed slip, when removed in the evening, may be "fixed" by shortly dipping in water and drying between blotting paper, or it may not, being quickly read; it shows a mostly continuous succession of bands of various shades of black, or rather brown. For comparison, Herr Kreuzler made a scale of 10 degrees of darkening, exposing strips of the paper a given time under different angles of incidents of light. Bands of the experimental strip that appear homogeneous are now measured with reference to breadth and intensity, and the sum of the products of those quantities is taken as a measure of the action of light rays falling on the instrument in a given time. The results are considered highly satisfactory.

A NEW STEAM WAGON.

A new style of vehicle, designed to be propelled by steam, has recently made its appearance in London. The carriage closely resembles an ordinary dog-cart; the shafts are very short, and incline together, meeting two feet in front of the dashboard; between them there is a third wheel, working upon an upright shaft, which could be turned by a handle placed the same as that of a bicycle; this handle is worked by reins in the hands of the driver. The fuel used is benzine, and the burner used is described as being no larger than an ordinary lat. The steam is generated in a coil boiler of copper. The tube of which the boiler is composed is stated to have been tested to a pressure of 2,000 pounds per square inch. This is, however, an unimportant matter, as the explosion of a coil boiler is never dangerous, and only results in putting out the fire and stopping the engine. The ordinary steam pressure is about 60 pounds. The vehicle is described as working very handily and being under very complete control. As only three or four persons are to be carried, the amount of power required is merely nominal. The speed, if we are not mistaken, was reported at something like 10 miles per hour. If there was any market for steam road wagons, or rather steam pleasure carriages, there would not be the least difficulty in producing them. The machinery needed is very light and can be stowed away beneath the seats or in the box, while the quantity of coal or benzine needed is very small. The speed of such machines is almost unlimited. Steam coaches on good roads

have made as high as 35 or 40 miles in an hour, and from 12 to 18 were rates that were regularly maintained by some of the English steam passenger coaches before the railways drove them off from the common roads.

THE FIRST STEEL BRIDGE IN AMERICA.—Arrangements have been concluded by Gen. D. D. Smith, chief engineer of the Chicago & Alton railway, for constructing the first all-steel bridge in America. Gen. Smith will be remembered by his connection with the United States Government Board for Testing the Strength of Iron and Steel, experiments which were carried on by him several years ago. His researches have at last brought him to the conclusion that steel bridges can be built cheaper than iron, and be equal in durability. The bridge will be erected over the Missouri river on the Chicago & Alton

WATERPROOFING FOR LEATHER.—A good article may be made by using paraffine melted with the requisite quantity of drying oil, and casting it into suitable blocks for subsequent use. This being softened by heat, the leather of the manufactured articles, as shoes and harness, is coated with it, and placed near a fire or in a warm place, until the composition has been absorbed. When leather has been impregnated with the mixture it is not only perfectly waterproof, but it is also rendered softer and more durable. Shoes retain all their firmness and natural elasticity, and blacking makes upon them a better polish than before. This same composition is also useful for waterproofing woven goods. It is placed on the under side of cloth for garments, either by melting and applying moderately with a brush, or by



AN APACHE SQUAW AND PAPOOSE.

railway. It will be of five spans of 350 feet each. The elevation over high-water mark will not be less than 80 feet, at which height the light steel rods of the "Howe truss" will look like silver cobwebs, glimmering in the sunshine. For all its frail appearance, the bridge will have a strength reached by but few existing structures in the world. The total amount of steel used in the construction will be about 1,500 tons, equivalent to almost double that quantity of iron.—*American Journal of Industry.*

Dew.—Mr. George Dines, who has made extensive experiments and observations on the formation of dew, finds that the depth of deposit in England in an evening rarely exceeds a hundredth part of an inch; and that the average annual depth of the dew deposited upon the surface of the earth does not exceed an inch and a half.

rubbing with a block of the preparation. The complete diffusion of it through the texture is effected by passing the cloth between hot rollers. Fabrics prepared in this manner, while they repel water, are perfectly pervious to air. For this reason they are superior to ordinary oil-cloth and rubber goods. They also look better than garments made of rubber, as the finished appearance of the cloth is in no way changed by the treatment.

A COLORED child had a fall from a second-story window the other day, and his mother, in relating the incident at a grocery store, said: "Dere dat child was a-coming down feet first, wid every chance of being killed, when de Lawd He turned him over, de chille struck on his head, and dere wasn't so much as a button flew off."