

obtained were brown, grayish brown, and slate colored. No tinge of violet, blue, or green, was obtained in any case. In every case the color of the block dried at 100° was almost, if not exactly, identical with that of the block treated with the same wine and dried at the temperature of the laboratory.

According to the reactions obtained with these reagents, the coloring matter of California wines appears to be much more uniform than that of European wines. The reactions are not always the same as those obtained with the more ordinary European wines; for instance, a gray, or yellowish, or orange-gray precipitate or solution is sometimes obtained with reagents which are said to give green or grayish green with French wines. On the other hand no reactions were obtained which are said to be characteristic of wines colored with vegetable pigments.

THE PENETRATION MACHINE—AN EXPLANATION.

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ON page 59, January number, 1895, of this JOURNAL, a somewhat vague reference is made to a testing instrument. The identity of the instrument referred to is made manifest to me by the context. The instrument is known by those who have to do with it as the Penetration Machine; first described in print by myself in the *School of Mines Quarterly*, **10**, 297, under the title "An Apparatus for Determining the Relative Degree of Cohesion of a Semi-Liquid Body." The reference above noted, by some mischance, does the instrument and its work injustice. The origin of the instrument was due to pressing needs in the technology of asphalt cements used for paving purposes. These cements, made by different parties using different tempering agents, were very varied, and at the time of the origin of this instrument there was no way other than chewing the cement for foremen to test whether the cement was of required consistency or not. Since that time (1889) thousands of tons of cement have been manufactured, and the whole of this cement has been strictly tested by this machine with nicety and satisfaction. These cements are made in all parts of the country, to a certain penetration number, previously determined as necessary according to the different uses of the cement.

Without this control cements would be used that were not suited for the purpose designed, and much damage would be occasioned in different cities, which damage would much cripple the asphalt paving industry. Cargoes of cement are shipped, one requirement of the cement being that it shall have a certain penetration number previously determined by the contracting parties. Since the introduction of this testing apparatus many qualities of cement have been studied and others discovered. By it we have learned the influence of mild or sudden and marked changes of temperatures, and the consequence of severe cold. It enables us to learn the influence of hardening and softening agents, a matter of great importance in the practical uses of asphalt cement. Thus it is manifest that this instrument has an important and serious part to perform in a great industry, and that its use is far from being an idle pastime.

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NOTES.

Argon: A New Constituent of the Atmosphere.—At the meeting of the Royal Society, held on January 31, the long-expected paper by Lord Rayleigh and Professor Ramsay was read, and a full report has just been received by way of *The Chemical News*, of February 1, from which the following condensed summary is taken: A careful comparison of the nitrogen from urea, ammonium nitrite, and from nitrous and nitric oxid—"chemical nitrogen" with atmospheric nitrogen was made, and gave a weight per liter for

Chemical nitrogen of.....	1.2505 grams
Atmospheric "	1.2572 "

Nitrogen which had been extracted from the air by means of magnesium was separated also and gave a figure differing inappreciably from that recorded above for "chemical nitrogen."¹ The nitrogen contained in magnesium nitride was also converted into ammonium chloride and this was found to contain exactly the proportion of chlorine contained in ordinary ammonium chloride. From this it was concluded that red-hot magnesium withdraws from "atmospheric nitrogen" no substance other than nitrogen capable of forming a basic compound with hydrogen. After having endeavored in every way possible to detect in "atmospheric nitrogen" known gases to account for the difference in specific gravity the authors finally repeated Cavendish's experiment. It will be remembered that Cavendish found that when air to which oxygen was added, the electric spark passed for several days and the nitrous and nitric acids

¹ See also page 211 of this issue.