

SINGULAR DISCOVERY IN CONNECTION
WITH PHOSPHORESCENCE.

The property possessed by certain metallic sulphides and other phosphorescent bodies of absorbing light when exposed to its influence, and giving out the same when brought into a darkened room, has long been known to scientists, but it is only quite lately that efforts have been made to utilize such properties. Of these, the most striking consisted in spreading a sulphide of this nature upon a flat tablet and exposing it to a strong light for a few seconds under an ordinary photographic negative. Upon removing the tablet thus impressed into a dark room, the picture on it will be found to be glowing in quite a mysterious and wonderful manner, and it will continue for some minutes to radiate the light which it absorbed.

It has occurred to an ingenious physicist, A. L. Henderson, to mix one of the most sensitive of these phosphorescent metallic sulphides with the bromide of silver, now so generally employed in the preparation of photographic dry plates, and, after emulsifying this mixture with gelatine, spreading it upon the surface of glass plates, and treating the same as ordinary ones, except in so far as regards the exposure, which must be momentary. He appears to have reasoned in this way: With even the briefest exposure capable of being given, a certain modicum of change will be produced on the sensitive bromide of silver, although manifestly such as will be incapable of yielding a properly developed image. But the light also falls upon the atoms of the phosphorescent powder incorporated in the film; and as these in turn radiate such light, it follows that they will complete the imperfect exposure set up in the bromide by the direct action of the light.

This reasoning has been found correct, and the result at present stands that plates have been prepared having such exceeding sensitiveness as to be well impressed by what Mr. Henderson designates "the flash of a match."

Phosphorescent sulphides may easily be prepared by heating the carbonate of lime, of barites, of strontia, or other carbonate found most suitable, in a covered crucible with half its weight of sulphur. After an hour's exposure to heat, the preparation is complete and phosphors are obtained which, upon being briefly exposed to light and then withdrawn into a dark room, will be seen to glow brightly, the color of the light emitted depending upon the nature of the carbonate originally selected.

This application of a well recognized fact in phosphorescence is so novel, and calculated to be of so much use, that we have no doubt its progress toward development will be rapid.—*Scientific American.*

PRESERVING MEAT FOR FOOD IN CANCER.—Prof. Wickersheimer, a German chemist who has recently sold to the Prussian government a process for preserving organic substances, has since patented a process for preserving meat for eating purposes. A solution (heated to 50° C.) of 36 grams potash, 15 grams common salt and 60 grams alum, in 3 liters of water, is mixed with a second solution of 9 grams salicylic acid in 45 grams methylic alcohol, to which 250 grams glycerine is added. With this liquid the animal to be preserved is injected. In the case of small animals, 100 grams of the liquid for every one kilo. body weight, is recommended; in larger, the proportion may be reduced to 40 grams. Fishes, birds, and such small animals are not previously killed, but the injection made direct into the heart with a syringe having a sharp canula. Large animals are injected immediately after slaughtering, the liquid being introduced by one of the large cervical arteries. For cattle and swine, two or three grams saltpeter are added to the liquid. The flesh of animals so treated keeps (it is said) two or three weeks perfectly good and inodorous. If the preservation is to be for a longer time, the proportions of methylic alcohol, salicylic acid and glycerine are somewhat increased.

ANOTHER "NEW" LOCOMOTIVE.

The Hincley Locomotive Works of Boston are building a locomotive on a somewhat novel principle. It is the invention of Mr. Henry D. Shaw, and is described as follows in the *Boston Journal of Commerce*:

His peculiar idea in this matter is that of running the locomotive with two cylinders upon either side. One cylinder is attached to the crank upon one side of the center of the wheel, and the other cylinder to the opposite side of the same wheel, or opposite to the first connection. These cylinders are made one above the other, a connecting rod running from each cylinder directly to its crank-pin. The lower cylinder acts directly on the wheel or crank-pin in the wheel. The outside end of the crank-pin has a connection which passes to the center of the wheel, where it is taken hold of by an outside frame or a connection to the main frame of the locomotive, and affords it a bearing, while the extension of this piece makes up precisely the same kind of a connection with the locomotive driving wheel that the ship carpenter's auger affords him with the double bend in it, the cranks being each side of the center. This attachment is to be made to both sides of the engine. A yoke separates and keeps the connecting rods in place should either one let go, so that no interference is to be feared from this.

The idea is to relieve the engine of the awaying caused by taking hold at the angles and changing the pressure with each revolution at each end of the stroke. Theoretically this is correct. A locomotive is being built which will be finished within the next two or three weeks, and is, we understand, to be put over the New York and New England or the Boston and Providence railroad for a thorough practical trial. Mr. Shaw is certainly deserving of success, and we hope will meet it, as there is little doubt about the matter mechanically.

A HORSE SHOE IN A TREE.—A sycamore tree was recently blown down near the residence of Geo. Douglas, in Hartford, Connecticut. On cutting it up for fire wood, there was found embedded in the trunk, 59 inches in diameter, an old horseshoe with nails on one side only. It was 22 inches from the bark, or outer edge of the tree, the wood of which is perfectly sound. The tree is known to be more than 130 years old, and it is estimated that the shoe has been embedded in it 110 years. In ye olden times, it was a customary thing to nail old horseshoes to trees for hitching horses to, and it is supposed that this one was nailed there for that purpose, and that as the tree grew, it incased the shoe in it. Mr. Douglas' house formerly belonged to the Mather family. A brick building used to stand in the corner of the lot, where the Mathers had their office, and the probability is that the tree was used as a hitching post.

INSOLUBILITY OF RUBBER.—The most delicate of fabrics made of vulcanized rubber may be brought in contact, or immersed with impunity in such chemical liquids as sulphuric or nitric ether, oil of turpentine, or any of the essential oils. They may also be boiled in potash, lime and soap, by which, indeed, they are improved. In fact, vulcanized rubber articles either remain uninjured or are improved by exposure to agents that destroy other fabrics, and even wood, leather, iron, copper and brass.

LOOM FOR TENDER YARNS.—A Swiss loom maker, Hennegger, has invented a loom in which the shuttle is not thrown, but is handed over from side to side by hooks, much in the same manner as the silk loom handles. A loom on this principle was shown weaving in the Paris exhibition. The shuttle is handed by a peculiar mechanism, so that no strain is exerted upon the filling, and no friction upon the warp, as the shuttle does not run on the warp as in the ordinary loom.

POPULATION OF THE UNITED STATES.

The Census Bureau has figured so far upon the returns of population as to reach the conclusion that the total, exclusive of Alaska and that region west of Arkansas known as the Indian Territory, is 50,152,559. But while these figures are official they are not final, and may be changed hereafter in the revisory calculations, though it is not likely that such possible changes will go above the units, tens or hundreds columns. For all practical purposes the total population of the United States and Territories, exclusive of Alaska and the Indian Territory, may be stated at 50,152,000. The increase since 1870 has been 11,268,024, or nearly 9½%. The present population of the Pacific States and Territories, namely, California, Oregon, Nevada, Washington, Idaho, Arizona and Utah, is officially stated as follows:

California.....	804,686
Oregon.....	174,767
Nevada.....	62,285
Washington.....	75,120
Idaho.....	32,611
Arizona.....	40,441
Utah.....	143,907
Total.....	1,393,797

The increase of this division of the country since 1870 has been 451,866, or 48%. The increase in Nevada was but 6%, which is the lowest, while in Washington Territory it was 100%, which is the highest rate. The per cent. of increase in the Pacific division is greater than in any other. In the Eastern division, including New York, New England, New Jersey and Pennsylvania, the per cent is but 18. In the Western division, including Missouri and the Territories of Dakota, Wyoming and Montana, 34%. In the southern division, excluding Missouri and including all the other old slave States, 34%. In the district of Columbia, 35%. It is now conceded that the apparent large increase in the Southern States is due to the fact that this census was taken there with more regard to exactness than any preceding one, while that of 1870 was done in a slovenly and careless manner, not reaching a large mass of the population. There is but one city in the United States or on the American continent that contains over 1,000,000 population—New York. There are three others that contain over half a million; three others above 300,000; three others above 200,000, including San Francisco, and ten others above 100,000. The following is a carefully revised list of the cities that overgo 30,000 inhabitants each, California having two of them. It will be a good thing to keep for future reference:

New York.....	1,206,590	Columbus, O.....	51,005
Philadelphia.....	840,984	Paterson.....	50,287
Brooklyn.....	500,689	Toledo.....	50,143
Chicago.....	503,304	Charleston.....	49,999
Boston.....	362,335	Fall River.....	49,005
St. Louis.....	350,522	Minneapolis.....	46,887
Baltimore.....	332,190	Syracuse.....	45,850
Cincinnati.....	255,708	Nashville.....	45,461
San Francisco.....	233,956	Reading.....	43,590
New Orleans.....	216,140	Hartford.....	42,553
Cleveland.....	160,142	Wilmington.....	42,499
Pittsburg.....	156,881	Camden.....	41,958
Buffalo.....	155,137	St. Paul.....	41,498
Washington.....	147,307	Lawrence, Mass.....	39,178
Newark.....	136,409	Dayton.....	38,677
Louisville.....	123,645	Lynn.....	38,294
Jersey City.....	120,728	Denver.....	35,030
Detroit.....	116,842	Oakland, Cal.....	34,556
Milwaukee.....	115,578	Atlanta.....	34,308
Providence.....	104,850	Utica.....	33,913
Albany.....	90,908	Portland, Me.....	33,810
Rochester.....	89,363	Memphis.....	33,693
Allegheny, Pa.....	78,684	Springfield, Mass.....	33,240
Indianapolis.....	75,074	Manchester, N. H.....	32,630
Richmond.....	63,803	St. Joseph, Mo.....	32,484
New Haven.....	62,882	Grand Rapids.....	32,015
Lowell.....	62,485	Wheeling.....	31,206
Worcester.....	58,296	Mobile, Ala.....	31,205
Troy.....	56,747	Hoboken.....	30,999
Kansas City.....	55,813	Harrisburg.....	30,702
Osmi ridge, Mass.....	52,740	Savannah.....	30,681
Syracuse.....	51,791	Omaha.....	30,518

CLOTH car wheels are the latest. They are the invention of a Frenchman, who is said to be very scientific.