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Contents.

Illustrated articles are marked with an asterisk.

Table listing various articles such as American manufactures, Lathes, speed of, and other technical and scientific topics.

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Table listing sections I through VII, including Mechanics and Engineering, Technology, Chemistry, Electricity, Light, Heat, Astronomy, and Natural History.

THE PROPERTIES OF LIGHT AND COLOR.

The idea that anything can be added to light by passing it through colored transparent substances, or by reflecting it from colored surfaces, is utterly erroneous, and proceeds simply from ignorance of the nature of light. It has been proved by Isaac Newton, and since his time by innumerable experiments of various kinds, that pure white light, such as comes from the sun to us, contains all the colors, as well as heat and chemical activity, and that they may be separated, or the light analyzed, by simply passing it through a prism of a transparent substance.

Densely transparent media retard the light, and this retardation will affect the rapid vibrations more than those of slower velocity; and under certain circumstances such media will cause light to be deflected from its course in such a way that the most rapid vibrations will be most deflected and the slowest least. This is the principle of refraction, by which light can be separated into its caloric, chemical, and luminous rays of different colors.

The apparent colors of objects are caused by their reflecting rays of vibrations of certain velocities, and neither reflecting nor absorbing others; and the hues of transparent colored objects are similarly produced. They pass only certain rays, and absorb the others; and the reflected or transmitted color is then called the color of the object.

An ordinary gas lamp, or candle light is not a pure white, being deficient in blue rays, and has an excess of red, orange, and yellow; a white object cannot, by such a light, be distinguished from a yellow one; light blue cannot be distinguished from green, and dark blue looks almost black. In regard to the nature of colored objects, whether painted or dyed, and of transparent media, such as colored glass or liquid solutions, the analysis of their colors by means of the spectroscopic shows that what we call simple colors are in most cases complex.

We have gone into the details of these rather elementary matters for the purpose of exposing the ignorance of those who ascribe to the glass a special chemical or curative influence. Some photographers have used blue glass long ago, in order to moderate the intensity of the light for the eyes of the sitter, without robbing it of too much of its chemical activity; and those photographers who possess common sense or experience know that, far from adding to the effect of the light, the blue glass is an impediment, and the necessary time of exposure is rather extended by its use than otherwise.

of the pigment: much greater than the differences in shade would lead us to expect. As a general thing, the pure reds, orange, and yellow, such as are produced by vermilion and chromates of lead, are photographically inert, and give blacks. The blues are the most active, most of all being being ultramarine, next the violet lakes. But even the red carmine takes well, as it has a violet shade; but among the blues, those bordering on green take least, and hence foliage tends to give dark effects, which are only slightly corrected by using bromine.

THE AMERICAN EXHIBIT AT THE COMING PARIS EXPOSITION.

Thirteen months now remain between the present time and the opening day of the French International Exposition. We believe that our manufacturers, from their experience at the Centennial, and at previous world's fairs, fully appreciate the value of these exhibitions as advertising mediums; and therefore it is unnecessary for us to dwell upon their advantages in that direction.

There is much being said about the necessity of a large appropriation from Congress, and the organization of a cumbersome body of officials to secure a suitable exhibit from this country. We need neither. The gentlemen who prepared their display at our Centennial can do it again, and need no official help. Our diplomatic officers in Paris should be able to look after the interests of American exhibitors there; and the organization of the national contribution, so far as it may be found conducive to timely despatch and compliance with the regulations of the Exposition officials, may be done on this side of the ocean.

It is urged that, because France made a good show at our Centennial, international comity requires that we should make as fine a display at her Exposition. Let those who hold this view, then, see that such an exhibit as they will be proud of is made, and let them pay for it. If money is necessary to help inventors who have not the means to forward their productions—and that is the least objectionable use to which pecuniary assistance can be devoted—let it be raised by popular subscription.