Progress of Our Colored Population.

According to a recent census *Bulletin*, the race count has been made for the South Atlantic and South Central States, and for Missouri and Kansas, in advance of the main work of tabulation. The total population embraced in this count is 23,875,259, of which 16,868,205 were white, 6,996,166 colored, and 10,888 Chinese, Japanese, and Indians. In these States were found in 1890 fifteen-sixteenths of the entire colored population of the United States, so that for the purpose of immediately ascertaining the percentage of increase, the returns of these States are adequate and not likely to be materially affected by the returns of the other States and Territories, where the colored population is small.

The popular belief that the negroes were increasing at a much greater rate than the white population is erroneous.

During the past decade the colored race has not held its own against the white in a region where the climate and conditions are, of all those which the country affords, the best suited to its development. We give a table which shows the relative increase:

States.	Total population.	White.	Colored.	Per cent. 1890.	
	23,875,259	16,868,205	6,996,166	White.	Colored.
Alabama	1,513,017	830,796	681,431	54·91	45·04
Arkansas	1,128,179	816,517	311,227	72·37	27 59
Delaware	168,493	139,429	29,022	82·75	17·22
District of Columbia	230.392	154,352	75,927	66·99	32·96
Florida	391,422	224,461	166.678	57·35	42·58
Georgia	1.837,353	973,462	863,716	52·98	47·01
Kansas	1,427,096	1,374,882	51,251	96·34	3·59
Kentucky	1,858,635	1.585,526	272,981	85·30	14·69
Louisiana	1,118,587	554,712	562,893	49·59	50·32
Maryland	1,042,390	824,149	218.004	79·06	20·92
Mississippi	1,289,600	539,703	747,720	41·85	57·98
Missouri	2,679,184	2.524,468	154,131	94·23	5·75
North Carolina	1 617,947	1,049,191	567,170	64·85	35·05
South Carolina	1,151.149	458,454	692,503	39·82	60·16
Tennessee	1,767.518	1,332,971	434,300	75·42	24·57
Texas	2,235,523	1,741,190	492,837	77·89	22·04
Virginia	1,655.980	1,014,680	640,867	61·27	38·70
West Virginia	762,794	729,262	33,508	95·61	4·39

Modification of the German Patent Law.

An amendment of the patent law of 1877 has been recently passed by the Reichstag, after having been read three times, and will come into force on the 1st of October next. The chief point to be noticed in the new law is that the examination of patents with regard to novelty is not to be abolished. The new law does not decide what amount of invention is patentable, so that this question must be settled in each case by the Patent Office as heretofore. Publication, if made more than a hundred years ago, is not to act in anticipation of a patent. Patents taken out in foreign countries are to act in anticipation against the inventor, and those claiming rights under him, only after a lapse of three months, and thus an extended period of time is allowed by the act for an application for a patent in Germany. If an invention is stolen from another person, and an application for a patent has been made, the inventor is able not only to oppose the granting of a patent to the applicant, but to obtain a patent for his own application. The patent fees may be paid for the whole duration of a patent in advance, so that the lapse of a patent through delay in the payment of fees may be rendered impossible. If a patent on which the full fees have been paid should be afterward annuled, the fees will be returned to the patentee. An application for the annuling of a patent shall not be made when the patent has been in existence more than five years. For the determination of this point, however, a period of three years is provided. The very high fees now payable for a German patent have not been diminished by the new act, but it is provided that such a lowering of the fees may be made by order of Federal Council. The important provision that a patent may be revoked after the expiration of three years if the patentee fails to carry out his invention in Germany to a suitable extent, or at least to do everything that he can to carry it out, remains in force, and should be particularly noticed by foreigners. The organization of the Patent Office is to be so regulated by the new act that there may be greater security for a proper and efficient examination of patents. Before an application is refused, the applicant is to have an opportunity of answering objections to the granting of a patent. If he should fail to obtain a patent, he may then support his claim by oral evidence. At the preliminary examination expert witnesses may be called, and a statement of the various attempts which the inventor had made may be presented. If the decision of a judge puts a new aspect on the case, the applicant is to have an opportunity of answering any objection raised. A proviso which is of great importance to chemical industries is that where proceedings are taken to patent a new material, every material of similar manufacture is regarded as included in the claim until proof to the contrary is shown. The damages payable for the infringement of a patent have been increased. The Patent Office, Berlin, was established at its new building in April last. This new office is in every respect suitable for its purpose, whereas the old one was too small. The public obtain a great advantage from the new arrangement, since the important technical library is now open to all persons from 9 A. M. to 9 P. M.

IRIDESCENT GLASS.

BY GEO. M. HOPKINS.

A visitor at the Metropolitan Museum of Art in this city cannot fail to notice in his tour of the galleries the exquisite ancient Cyprian glass ware, with its gorgeous iridescence surpassing in brilliancy of color anything ever produced by artificial means. So far as is at present known, this effect can be produced only by the corrosive action of the air and moisture of the soil in which these objects have been buried for centuries.

Glass having a similar appearance, but without the same brilliancy of color, has been found elsewhere, and a certain degree of iridescence has been imparted to glass of modern manufacture by flashing it during the annealing process with stannous chloride, thus depositing on the glass an exceedingly thin film, which decomposes the light and thus yields a pleasing color effect. Glassware of this kind is beautiful, and was at one time much in demand, but at present it can hardly be found on sale.

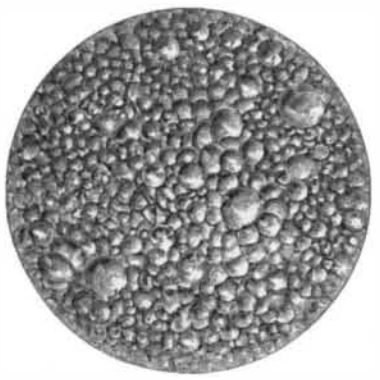

Fig. 1.—IRIDESCENT FILM—MAGNIFIED.

Through the courtesy of General L. P. Di Cesnola, director of the Metropolitan Museum of Art, the writer has been enabled to examine specimens of ancient Cyprian glass secured by him in his archæological explorations in Cyprus.

A microscopical examination of this glass shows that the surface is covered with exceedingly thin transparent films formed by matter dissolved from the glass. The body of the glass is pitted over its entire surface with minute cavities, which are circular or elliptical or oblong in outline, and either spherical, ellipsoidal, or cylindrical in respect to their concavity, and the films conform to the pitted surface of the glass. These films, of which there are many superposed, are so thin as to float in air like down when detached. They decompose the light by interference due to reflections from the front and rear surfaces of the film, and give rise to the gorgeous play of color for which these ancient specimens of glass are noted.

The appearance of the film from this glass when highly magnified is illustrated in Fig. 1. The color effect is, of course, wanting. By transmitted light the color is complementary to that shown by reflected light. Examined by polarized light, the color is heightened still more with all the changes that may be brought about by rotating the polarizer, analyzer, or the object itself. The figure under polarized light without the color is shown in Fig. 2.

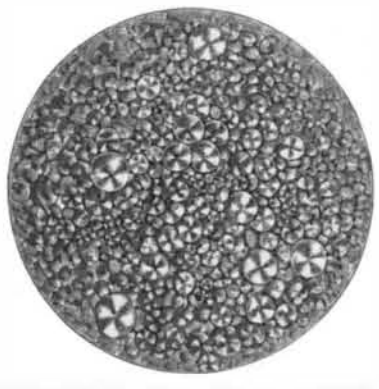

Fig. 2.—IRIDESCENT FILM—BY POLARIZED LIGHT.

If the effects secured by long ages of treatment in Nature's laboratory could be produced artificially on modern glass at a reasonable cost, it would seem to be an object well worth striving for.

Lumbering in California.

The Madera Flume and Trading Company started up its mountain saw mills recently. The roads are now being cleared and timber got out. It is expected that the output for the season will exceed 17,000,000 feet.

This company has a V-shaped flume sixty-two miles long, extending from the mountains to the plain. The lumber is not shipped down this flume piece by piece, but several planks are clamped together at the end, and then a train is formed from several piles and connected by small ropes. Section stations, where from two to four men are found, are located about every six miles. It is their duty to see that there are no stoppages or breakages, jams and so on. The lumber is shipped from the mountain mills during the day, and reaches the yards at Madera at night, being twelve hours in transit. The expense of this mode of transportation is much cheaper than any other that has been devised for that purpose. As high as 20,000 feet have been shipped in one day. The two saw mills are known as the California and Soquel mills, and combined have a sawing capacity of 150,000 feet per day. This work has been facilitated greatly by the construction of a narrow gauge railroad from the mill to the vicinity of the logging camps, and the logs are now hauled by a large engine, on cars made expressly for that purpose, thus doing away with many teams. At the yard located in Madera the lumber is taken from the flume and piled up to dry for the market. This yard covers a large area of ground, and millions of feet of lumber are stored there annually. A large planing mill is also operated there.

The expenses of the mill at Madera and at the mountain mills aggregate $15,000 per month during the logging season. Jack Dysdale is general superintendent of the mountain mills.—*Pacific Lumberman.*

Genesis of the Elements.

Professor William Crookes closes a most interesting address before the Institution of Electrical Engineers on the subject "Electricity in Transitu; from Plenum to Vacuum," with the following remarks on the genesis of the elements:

It is now generally acknowledged that there are several ranks in the elemental hierarchy, and that besides the well defined groups of chemical elements, there are underlying sub-groups. To these sub-groups has been given the name of "meta-elements." The original genesis of atoms assumes the action of two forms of energy working in time and space—one operating uniformly in accordance with a continuous fall of temperature, and the other having periodic cycles of ebb and swell, and intimately connected with the energy of electricity. The center of this creative force in its journey through space scattered seeds, or subatoms, that ultimately coalesced into the groupings known as chemical elements. At this genetic stage, the new-born particles vibrating in all directions and with all velocities, the faster-moving ones would still overtake the laggards, the slower would obstruct the quicker, and we should have groups formed in different parts of space. The constituents of each group whose form of energy governing atomic weight was not in accord with the mean rate of the bulk of the components of that group, would work to the outside and be thrown off to find other groups with which they were more in harmony. In time a condition of stability would be established, and we should have our present series of chemical elements, each with a definite atomic weight—definite on account of its being the average weight of an enormous number of subatoms, or meta-elements, each very near to the mean. The atomic weight of mercury, for instance, is called 200, but the atom of mercury as we know it is assumed to be made up of an enormous number of subatoms, each of which may vary slightly round the mean number 200 as a center.

We are sometimes asked why, if the elements have been evolved, we never see one of them transformed or in process of transformation into another. The question is as futile as the cavil that in the organic world we never see a horse metamorphosed into a cow. Before copper, *e. g.*, can be transmuted into gold it would have to be carried back to a simpler and more primitive state of matter, and then, so to speak, shunted on to the track which leads to gold.

This atomic scheme postulates a to and fro motion of a form of energy governing the electrical state of the atom. It is found that those elements generated as they approach the central position are electro-positive, and those on the retreat from this position are electro-negative. Moreover, the degree of positiveness or negativeness depends on the distance of the element from the central line; hence, calling the atom in the mean position electrically neutral, those subatoms which are on one side of the mean will be charged with positive electricity, and those on the other side of the mean position will be charged with negative electricity, the whole atom being neutral.

This is not a mere hypothesis, but may take the rank of a theory. It has been experimentally verified as far as possible with so baffling an enigma. Long-continued research in the laboratory has shown that in matter which has responded to every test of an element there are minute shades of difference which have admitted of selection and resolution into meta-elements, having exactly the properties required by theory. The earth yttria, which has been of such value in these electrical researches as a test of negatively excited atoms, is of no less interest in chemistry, having been the first body in which the existence of this sub-group of meta-elements was demonstrated.