

were the favorite form of ornamentation in Hawaii. There are weapons edged with sharks' teeth, which went with these feathered marks of state, and hand daggers, which were fashioned at the time the first voyagers came to the island. In the museum there is also a collection [of Hawaiian birds, containing many choice specimens, not a few of which are now extinct. The museum also includes many specimens of mats, native Hawaiian cloth beaten from the inner bark of the paper mulberry tree, wooden bowls and dishes, some of them being nine feet in circumference, nets, hooks, native sleds, weapons, etc.

Very few of the images of the Hawaiian gods remain in Hawaii. Most of them were taken away to American and European museums. There are a few, however, in the Bishop Museum, and an effort is being made to buy back as many as possible. The collections from Fiji, Society and Solomon Islands are very interesting. The art gallery is not particularly notable. The Bishop Museum is destined in time to become one of the most noteworthy institutions in the world. It is not likely that any similar collection will be founded in any of the other Polynesian islands for many years. Meanwhile the museum is collecting and preserving objects that are of priceless value in throwing light upon the history and evolution of a most interesting people.

THE EIGHTH INTERNATIONAL GEOLOGICAL CONGRESS, PARIS, 1900.

The Seventh International Geological Congress, at its meeting on September 3, 1897, decided to accept the invitation of the geologists of France to hold the eighth congress in Paris in 1900. The French geologists have formed a committee of organization, consisting of sixty of their number, and have just issued the first circular of information regarding the congress, and they present a very attractive programme. The officers of the committee are: President, Albert Gaudry; vice-presidents, A. Michel-Lévy and Marcel Bertrand; secretaries, Charles Barrois, Cayeux, Léon Bertrand, Thévenin and Thomas; treasurer, L. Carez.

The sessions of the congress will begin on the 16th and close on the 28th of August, 1900. The length of the meeting will allow members of the congress time to visit the "Exposition Universelle," to study the geological museums in the city, and take part in the geological excursions offered in the vicinity of Paris. The sessions will take place in one of the buildings of the Exposition, and those members of the congress who desire to exhibit geological maps, sections, photographs, and specimens are asked to apply to the commissioner of their own country, who will reserve for them a place in the proper class.

The committee of organization will strive to show the geology of the whole of France to the members of the congress; but to avoid too great crowds and to facilitate as far as possible the studies of specialists, it has been decided to organize a large number of simultaneous excursions, which will take place before, during, and after the business sessions. The excursions will be of two kinds; the general, open to the greatest possible number of members; and the special, reserved for specialists and limited in numbers to twenty participants each. The full itinerary of the excursions has not yet been published, but a preliminary skeleton can be given now which will show what rich treats are in store for those who can avail themselves of the opportunities offered.

Three general excursions are planned: A series of short ones among the celebrated fossil localities of the Tertiary basin of Paris, which will take place during the sessions of the congress; one of ten days into Boulogne and Normandy for the study of the cliffs of the Manche River and the classic fossiliferous beds of the Cretaceous and Jurassic from Boulogne to Caen; another of ten days for the comparative study, from the standpoint of physical geography as well as of geology, of the three great volcanic regions of the massive of central France. The complete chronology of eruptions from the Miocene up to the end of the Quaternary will be displayed, and the excursion will then be continued through the Causses of the Lozère, and the gorge of the Tarn to the mountain of Aigoual. Nineteen special excursions are proposed, varying in length from four to twelve days. They and the special object of each are as follows: To the Ardennes for the stratigraphic study of the Cambrian and the Devonian; to Picardy for Cretaceous phosphates and Quaternary clays; to Brittany to see the metamorphism of fossiliferous paleozoic strata under the influence of intrusive granites; to Mayenne for the study of the section of the basin of Laval and the crystalline rocks of the Coëvrons; to the Cher and the Sarthe valleys for Upper Cretaceous strata; to Pont Levoy and Manthelon, to visit the celebrated fossiliferous localities of the shell marls of Touraine; to the Liassic and Permian regions of Morvan, with their associated eruptive rocks; to the coal mines of Commeny and Decazeville; to the massive of Mont Dore and the chain of the Puy and Linagne, for the study of the volcanic craters in the vicinity of Clermont, the succession of eruptions of Mont Dore, and the peperites, basalts, and phonolites of the Limagne; to the Jurassic ter-

rain of the Charentes, with its varied facies of cephalopods, oolites, and coral reef, and the Cretaceous cliffs with their rudistids; to the basin of Bordeaux, where a section from the beds of the Middle Eocene to the Miocene is to be studied; to several Tertiary basins of the Rhone, and Mesozoic and Tertiary areas of the Lower Alps; to the Alps of the Dauphiny and Mont Blanc for the study of folds; to the High Alps near Mont Pelvoux to examine metamorphic schists and gneiss, granite massives with syenites, diabases and lamprophyres, coal with eruptions of orthophyres, other sedimentary and eruptive rocks, and numbers of tectonic problems; to Mont Ventoux and Mont Lure for overthrusts and unconformities among Upper Cretaceous, Eocene, and Oligocene strata, and for fluvioglacial terraces; to Lower Provence for lacustrine Cretaceous and other formations; to the region of the Montagne Noire, where fossiliferous and metamorphosed paleozoic strata, and fossil-bearing lower Jurassic and Tertiary beds are to be studied; and, finally, two excursions to the Pyrenees, one of which will be for the purpose of studying the eruptive rocks near Lake Lherz and the granites and their contact phenomena in the upper valley of the Oriège, and the other to examine the sedimentary areas of Corbières, Haute Garonne, Lourdes, etc., comprising Jurassic, Cretaceous, and Eocene rocks, giving numerous fossiliferous exposures, including the nummulitic beds. Later in the year another circular will be issued giving more detailed information about the excursions and membership in them.

A NEW POWER IN PHOTOGRAPHY.

Just when to stop the development of the photographic negative on a gelatino-bromide plate has always been more or less of a problem even to the expert; and as over is more easily corrected than under development, it has been the practice, when in doubt, to carry it beyond what was known to be necessary, trusting to reduction to bring the image back to the required density.

For this purpose various methods or reducing agents have been employed, but hitherto they have all had one fault in common—the altering of the values, tonality, or gradation, the most important feature of a negative. This they do in consequence of the fact, hitherto supposed to be unalterable, that reduction goes on equally all over the plate, as much being removed from the delicate detail, in what will be the shadows, as from the denser deposit of the half-lights and lights, resulting in negatives that give prints of the white and black or "soot and whitewash" variety.

Recently, however, the brothers Lumière, to whom photography is already much indebted, have given to photographers a new power in the shape of ammonium persulphate, a solution of which has the property of attacking only, or at least first, the higher and half-lights without touching the weaker deposits in the shadows, thus enabling them to reduce contrasts and secure such values or gradation as they may desire.

It will be evident that with one of the older reducing agents that reduce equally all over the plate, and the new agent which acts only on the denser parts of the image, the photographer may with confidence develop to any degree of opacity, knowing that he has the power, by reduction, to produce any degree of gradation that he may desire.

Hardly less of a problem, especially to beginners, has been how to secure correct exposure; and, according to at least one expert, the solution is to be found in ammonium persulphate. It is well known that over-exposure tends to flatness. The negatives may have all necessary detail, but the lights and half-lights are so translucent as to give only weak, flat prints. If, however, ammonium persulphate in conjunction with a bromide be added to the ordinary developing solution, any degree of contrast may be obtained, even to simple white and black, the degree being in proportion to the quantity of persulphate added. For this purpose W. B. Bolton recommends a solution of ammonium persulphate 25 grains and ammonium bromide 5 grains in one ounce of water, and a few drops added to the developer. The action will be slower, and the degree of contrast greater, in proportion to the quantity of solution added; but a few experiments will show just what that quantity should be for any reasonable amount of over-exposure.

It may be well to add that the new reducer is not the acid or hydrogen-sulphate, NH_4HSO_4 , sometimes called the persulphate, but the true persulphate, NH_4SO_5 , said to be produced by electrolysis from the hydrogen-sulphate, thus $NH_4HSO_4 = NH_4SO_5 + H$, the atom of hydrogen being eliminated and the persalt formed at the negative electrode.

COLONIES OF THE WORLD.

"The Colonies, Protectorates, and Dependencies of the World, their Area, Population, Revenues, and Commerce, and the Share of the Mother Country in their Commerce," is the title of a publication just issued by the Treasury Bureau of Statistics. The colonies, protectorates, and dependencies of the world number 126. They occupy two-fifths of the land sur-

face of the globe, and their population is one-third of the entire people of the earth. Their total imports average \$1,500,000,000 worth of goods annually, and of this vast sum more than 40 per cent is purchased from the respective mother countries. Of their exports, which considerably exceed their imports, 40 per cent go to the respective mother countries. Large sums are annually expended in the construction of roads, canals, railways, telegraphs, postal service, schools, etc., but in most cases the present annual expenditures are produced by local revenues or are represented by local obligations. The revenues of the British colonies in 1897 were £151,000,000, and their expenditures £149,000,000. While the public debt in the more important and active of these communities aggregates a large sum, it is represented by canals, railways, public highways, harbors, irrigation and other public improvements intended to stimulate commerce and production, the railways in operation in the British colonies alone aggregating 55,000 miles.

Of the 126 colonies, protectorates, dependencies, and "spheres of influence" which make up the total list, two-fifths belong to Great Britain, their area (including the native feudatory states of India) being one-half of the grand total of colonial territory, and their population considerably more than one-half the grand total of colonial population. France is next in order in number, area, and population of colonies, etc., though the area controlled by France is but about one-third that of Great Britain, and the population of her colonies less than one-sixth of those of Great Britain. Commerce between the successful colonies and their mother countries is in nearly all cases placed upon practically the same basis as that with other countries, goods from the home countries receiving in the vast majority of cases no advantages over those from other countries in import duties and other exactions of this character. In the more prosperous and progressive colonies the percentage of importations from the mother countries grows somewhat less as the business and prosperity increase. The chief British colonies in North America (Canada and Newfoundland), which in 1871 took 50 per cent of their importations from the home country, took in 1896 less than 30 per cent from Great Britain; those of South Africa (Cape Colony and Natal), which in 1871 took 83 per cent from the home country, took but 71 per cent in 1896; those of Australia and the adjacent islands, which in 1876 took 43 per cent from the home country, in 1896 took but 40 per cent. The French colonies now take from the home country about 42 per cent of their total imports, while the British colonies obtain about 40 per cent of their total imports from the home country. The tables show:

1. The colonies, protectorates, dependencies and "spheres of influence" of various countries of the world having possessions of this character, with area, population and number of colonies in each case.
2. The British colonies, protectorates, dependencies, etc., with area, population, revenue, expenditure, indebtedness, shipping and railways, also the imports and exports and the share of the home government therein.
3. The commerce of the British colonies and the share of the United Kingdom therein, at twenty-five one-year intervals from 1871 to 1896.
4. French colonies, protectorates and dependencies, showing their area, population, location and date of acquisition.
5. Commerce of the principal French colonies, with the share of France in the same at the latest attainable date.
6. The German colonies, protectorates, and dependencies, with area, population, location, date of acquisition, and form of government.
7. Netherlands colonies and dependencies, showing location, area, population, etc.
8. Portuguese colonies and dependencies, showing area, population, and general location.
9. Colonies, protectorates, dependencies, etc., of other countries, with area, population, etc.
10. Condition of each colony separately stated, showing its location, area, population, revenues, expenditures, imports, exports, and method of government, with additional data regarding roads, telegraphs, railways, and postal service, where practicable.

Colonies, dependencies and protectorates of the world, showing area and population of the colonial possessions, protectorates, dependencies and "sphere of influence" of each country:

Countries.	Number of Colonies.	Area (Sq. Miles.)	Population.
United Kingdom...	48	11,250,412	344,059,122
France.....	32	3,617,327	52,642,930
Germany.....	8	1,020,070	10,600,000
Netherlands.....	3	802,863	38,911,744
Portugal.....	9	801,060	9,216,707
Spain.....	3	245,877	256,000
Italy.....	2	104,000	650,000
Austria-Hungary....	2	23,262	1,568,092
Denmark.....	3	86,614	174,229
Russia.....	3	255,550	5,684,000
Turkey.....	4	564,500	17,489,000
China.....	5	2,881,560	16,680,000
United States*.....	4	168,287	10,177,000
Total.....	126	21,821,392	503,048,824

* Subject to ratification of treaty.
Note.—United Kingdom includes Indian Feudatory States; Russia includes Finland.