Correspondence.

The Position of Mountains.

To the Editor of the Scientific American:

I would like to know if there are any statements of geologists in regard to the comparative slant of the east and west sides of mountain ranges of such steeps as run north and south? According to theory, it seems to me the west incline should be more abrupt, or steepest. Is this verified by fact? Also the west range of parallel ridges should be of greater altitude. Is this true or not?

G. W. R. C.

Ashville, St. Clair Co., Ala., Nov., 1884.

[Answer.—Dana's Manual gives the following: "The position of the great mountain chains along the borders of the continents, and of uplifts, fractures, plications, volcanoes, metamorphism, chiefly on the seaward slope of the chains, proves that while the force from contraction was a universal force over the sphere, the lateral pressure was vastly more effective in a direction from the ocean than in the reverse direction. Now this landward action of the force seems to be a necessary consequence of the fact that the crust over the oceanic areas was and is abruptly depressed below the level of the continental, so that lateral pressure from its direction would have had the advantage of leverage beneath the continental crust, or rather, would have acted obliquely upward against it.

In the case of the Appalachians and the other ranges of the Atlantic border, the mountains front toward the ocean, that is, have their steepest folds on the oceanic side, and this is a common fact The Juras, on the contrary, front inland toward the Alps, and apparently because of their subordinate relations to the Alps, both geographically and genetically. In each case they were on the shoving side; while the greater fractures are usually toward the opposite side.

Our correspondent must not suppose that the slants of mountain ranges have anything to do with the revolution of the earth. They are the results of shrinkage, continental crumpling of the earth's crust Of course this view is controverted by another class of writers, who attribute the mountains to the pressure of immense accumulations of sediments, which, however, does not seem to be sufficiently comprehensive. But the steep side of ranges is apt to be found on the oceanic side, as stated above, or toward the shoving side.

Of Green, Red, and Yellow Rays in Photography.

In a publication on the sensitiveness of silver bromide to light, Prof. Vogel has shown that silver haloid salts, notably silver bromide, are affected by chemically inactive pigments, and he obtained these results by adding substances capable of absorbing the pigment. The value of this process to photographic art, where certain colors, as ultramarine and cobalt blue, are too effective, and thus reduced to white, and other more vivid pigments, like minium and chrome yellow, are rendered black, has been demonstrated by several experimentalists. The fact that the experiments were made with dry plates, and that the tar colors employed as medium of absorption acted decomposing on the photographic preparation, impeded the practical application of the principle. On examination of chromogenes with regard to their deportment toward humid, with silver solution impregnated, and dry collodion and gelatine plates, he observed that the properties of the pigments were altered with the composition of the film.

Collodion silver bromide impregnated with methyl violet and examined in the solar spectrum exhibited an extraordinary sensitiveness to orange, nearly equal to the sensitiveness to blue, while gelatine silver bromide plates possessed but one-fiftieth, and that of wet collodion plates to orange rays was still less. A different result was produced by eosine; a solution of 1 to 400 of this pigment has been added to gelatine silver bromide, and the sensitiveness to yellow was found to be one-third of that to blue; collodion silver bromide, treated in the same manner, indicated no difference in its behavior toward yellow and blue rays; humid, with silver nitrate impregnated collodion silver bromide plates, show a sensitiveness to yellow exceeding that to blue eight or ten fold. The peculiar behavior of eosine toward wet collodion plates has been further studied, and its cause explained by the following experiment:

By mixing a solution of eosine with silver-nitrate a red precipitate of tetra-bromo-fluoresceine silver is produced, which is not affected by dilute acetic acid and which is exceedingly sensitive to light. On precipitating eosine from a collodion solution, by dipping the glass plate coated with eosine collodion in a silver bath, and exposure of the film to different parts of the spectrum, a visible effect was produced by yellow green rays, ranging from D to E. The blue and violet portion of the spectrum did not affect the plate. Eosine silver is thus sensitive to light, especially to green and yellow rays, which is in accordance with its optical behavior—absorption—toward these rays. The same result is observed by treating collodion cadmium bromide with a 5 per cent eosine solution and silver nitrate. Silver bromide and eosine silver are precipitated simultaneously, and the latter acts on the silver bromide as optical and chemical sensitizer. Solution of eosine added to a silver bromide emulsion, free of silver nitrate, does not yield eosine silver. Mixtures of silver iodide and bromide exhibit a behavior to blue and yellow rays which is distinguished by an equal sensitiveness to both rays. And plates with a small percentage of silver iodide are about four times as sensitive to yellow as to blue rays. The property of eosine to absorb green, blue, and yellow rays gives rise to a further study of the optical properties of pigments and the discovery of a substance which will show a similar deportment to orange and red rays, and, like eosine, yield a silver compound Such a substance, which serves well for dry plates, has been found in methyl violet for orange and aldehyde green for red.

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Dyeing of Feathers.

In dyeing of feathers animal and vegetable pigments are used, and also aniline and its derivatives. At present they are employed quite extensively on account of their brilliancy and luster, and have, therefore, diminished the application of the former; aniline colors are more fugitive and subject to fading, especially when exposed to the action of direct rays. The feathers to be dyed are washed with water and Venetian soap, then steeped in tepid water and wrapped in linen cloth. Sulphur is then used to finish the feathers, giving them whiteness and luster; for this purpose flower of sulphur being thrown on glowing charcoal, and the feathers exposed to the vapor of sulphurous acid; they are then dried by application of heat.

The following process is used for dyeing black: 250 grammes of feathers are placed in a bath composed of 50 liters water and 500 grammes calcined soda, washed in warm water, and laid for five or six hours in a bath of iron nitrate of 7° Baume, and rinsed with cold water. They are now introduced in a lukewarm decoction of logwood and quercitron, 1 kilo of each, the temperature being gradually raised, left therein until a rich and deep color has been developed, and padded in hot water. To impart to the dyed feathers gloss, they are passed through a bath consisting of 6 liters water and 250 grammes oil.

Another method adapted for dyeing of inferior articles is the following: The feathers are cleansed by boiling in weak potash lye, are placed for twenty-four hours in a bath of iron acetate, dried, and treated with a hot decoction of nut galls—the acetate of iron being prepared by dissolving 2 kilos iron filings in 2 liters vinegar, and filtration of the liquid.

For dyeing brown, baths made of archil and Brazil wood are employed, and solutions of cream of tartar, tin, or alum. Violet and lilac colors are produced upon feathers by dyeing them red by means of Brazil wood, and finally blue with a weak solution of indigo. Blue is produced by dyeing either with indigo carmine and cream of tartar or with logwood, alum, and copper sulphate. Indigo and catechu are used in dyeing green; Brazil wood and archil for red shades; and safflower for rose-color tints. Yellow and orange are obtained from decoctions of Brazil wood, turmeric, and fustic with appropriate mordants, as alum and cream of tartar.

The most valuable dye is obtained from cochineal, which is applied with cream of tartar and tin solution. These pigments are at present partly superseded by aniline and its derivatives. Feathers to be dyed with these colors are steeped in a cold solution of the respective pigment, the concentration of which depends on the shade to be attained, and are previously cleaned with soda or alum solution. Crimson and rose color are most frequently used in dying of feathers, besides fuchsine, coralline, and saffranine.—*Erfindungen.*

Damages for Communicating Whooping Cough.

In a case recently tried in the United States Circuit Court at New York, damages were asked against a person because he had taken his children to a boarding house, when they were sick with the whooping cough. The child of the proprietor took the disease in this way, and some of the boarders left the house and went elsewhere. The court held that damages must be awarded for whatever loss resulted from the bringing of the disease to the house. The opinion of the judge is in part as follows "The defendant took his children when they had whooping cough, a contagious disease, to the boarding house of the plaintiff to board, and exposed her child and children of the other boarders to it, who took it.

"The jury have found that this was done without exercising due care to prevent taking the disease into the boarding house. She was put to expense, care, and labor, in consequence of her child having it, and boarders were kept away by the presence of it, whereby she lost profits. Words which import the charge of having a contagious distemper are in themselves actionable, because prudent people will avoid the company of persons having such distemper. The carrying of persons infected with contagious disease along public thoroughfares, so as to endanger the health of other travelers, is indictable as a nuisance."

Arrow Release.

AT the Newport meeting of the National Academy of Sciences, Prof. E. S. Morse read a paper on "Methods of Arrow Release in Eastern Archery."

He stated that for two years past, he bas been investigating the methods of arrow release. The subject is important in anthropological researches, since observations on the affinity of nations can at least be checked by comparing their methods of releasing the arrow. It is of the highest importance to prosecute these investigations vigorously, since arrows are rapidly going out of use all over the world. In some Eastern nations a short ball is already coming into use instead of arrows; and various devices vie with firearms in supplanting the use of arrows.

Different peoples, then, have characteristic methods of holding the bow and arrow. The English hold the arrow between the first and second fingers, or sometimes between the second and third fingers, both grips being shown on ancient tapestries, etc. The thumb assists in the grasp. The arrow passes left of the bow.

Children usually hold the arrow with thumb and forefinger, but no string bow can be so drawn. The Ainos in Japan have this method. They must have very strong hands. Their arrows have a prominent knob to assist them in grasping.

The Japanese grasp the string with the thumb, and bring the forefinger over the thumb, while the arrow passes to the right of the bow. This seems to be the best possible method, because it releases both sides of the arrow equally and simultaneously. It also presses the arrow against the bow. The Japanese wear a glove with a groove for the arrow.

All the Mantchu-eyed people have this method of release. The Chinese use a round horn ring for the thumb. The Coreans use a ring of somewhat different shape. The Turkish release is the same. There has lately been exhumed on the river Oxus a clay tablet associated with coins 200 to 300 B.C., in which the same method is shown as being in use at that date

The Zuni Indians were the first that he examined. He found among them that the thumb and forefinger grasp the arrow, and the second and third finger the string. The same method prevails among all the tribes he has examined.

Among the Assyrian tablets, he found various methods of release portrayed—the Saxon, the North American, and the Aino; but he did not find a trace of the Mongol release.

Dr. Baelze, the most important contributor to this branch of ethnology, thinks there are affinities between Japanese and Assyrians, but the study of bow and arrow methods does not confirm this theory.

Prof Morse recently met Lieut. Murdoch, who reports that at Port Barrow he found the natives using no Mongol nor North American, but the Saxon release Their arrows have a flattened end, so as to pass readily between the fingers.

New Railway Signal.

Railway men, especially train men, know the use of the torpedo in warning a following train of danger saving time, and for other emergencies which arise during the run of a train in sections, where one section is close behind another. The practice has been to drop off a man, or stop the train while the hind brakeman adjusted a torpedo, thereby losing valuable time. J. H. Bevington has produced and patented an instrument which is so arranged that with it a torpedo with steel clasps can be adjusted to the rail from the platform of the car while running at any high rate of speed. A clamp containing a signal flag, another containing a torch which will burn ten minutes for night signals, and one containing a taper which will burn long enough to show the rail while making the adjustment can all be attached to the rail by this ingenious instrument, while the train is running at high speed. These signals are applicable to any code of rules governing the use of torpedoes as cantion or danger signals. The torpedoes make a very loud report, and their spring steel clamps prevent all liability of being thrown from the rail by a locomotive passing over them. The torches are limited to burn ten minutes, and no storm will extinguish them until burned out.

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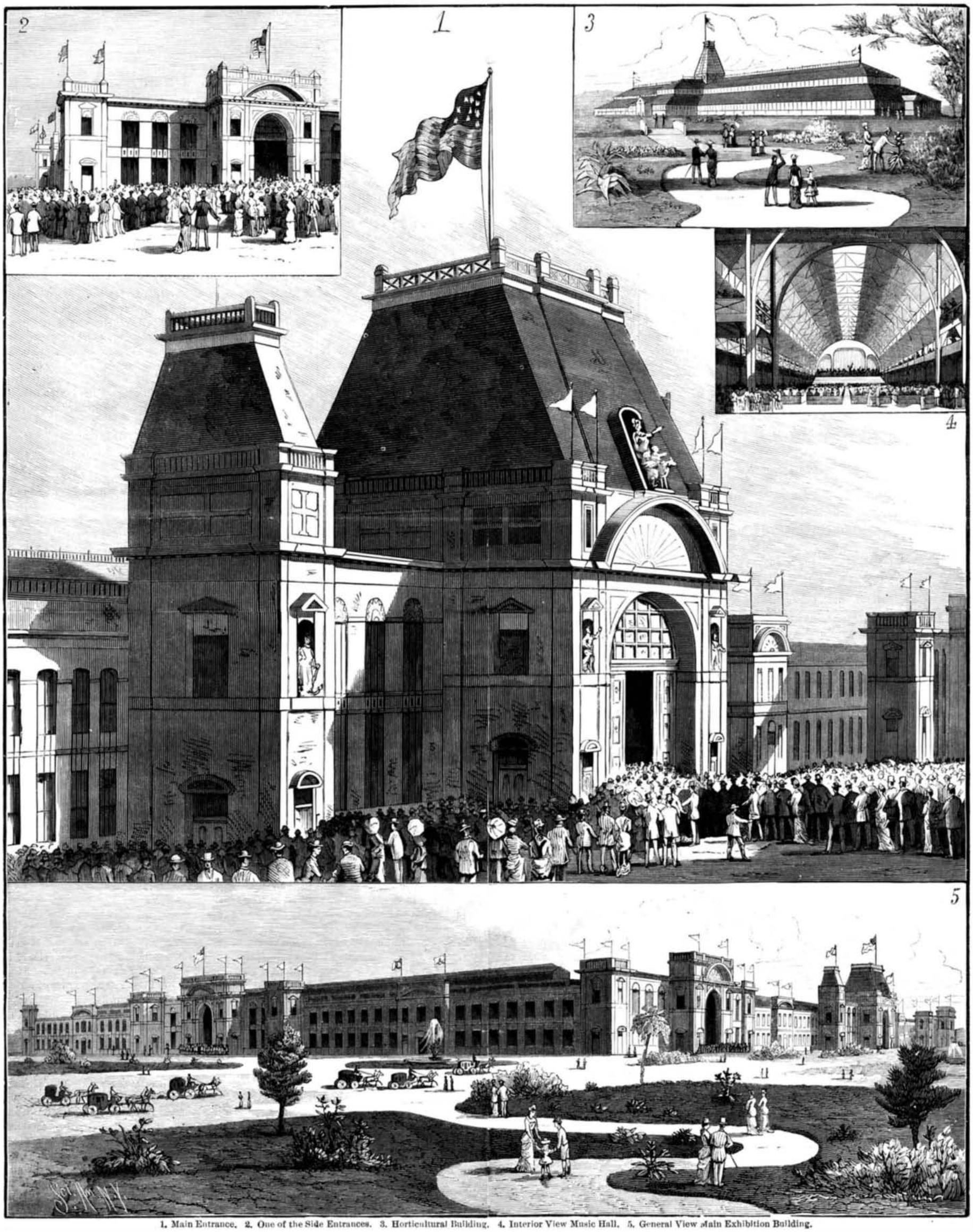

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THE WORLD'S INDUSTRIAL AND COTTON CENTENNIAL EXPOSITION, NEW ORLEANS.—[See page 413.]

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