Nationality and Scenery.

In the introduction to an article in the Deutsche Rundschau, descriptive of the German landscape, Herr Friedrich Ratzel shows by a few well directed allusions how the intrinsic character of the scenery of a region, even in its apparently most natural features, is affected by the nationality that occupies it, and reflects the character of that nationality. The allusions are local, but the principle they illustrate is general. A country with such a history as Germany's can have no purely natural landscape, says the Popular Science Monthly. The people and their land are the resultant of a long material development. When the Romans knew Germany—a barbarian region with few inhabitants—the works of man were less in evidence, and nature prevailed. The effects of cultivation have worked in two principal directions: First, the woods are cleared up, the water is confined within limits, the habitations of men are multiplied and enlarged and made more durable, and new plants and animals are brought in. Then uncontemplated changes step in, which proceed of themselves from the works of cultivation. With the drying of the soil the climate is modified. The introduction of new plants and animals imposes new features upon the conditions of life. Where before only stretches of heath, moor, and swamp formed natural openings in the predominant forest, extensive woodless regions arise through the labors of man, from which the shade-loving plants and animals that were protected by the forest gloom disappear, and other inhabitants are at home in the cultivated fields. The variations in the particular shaping of these changes are more especially marked where the boundaries run through mountain regions. In the Saxon Erzgebirge the forests have lost all their wildness, and plantations of firs and oaks grow in regular order, all nearly of a height, with no trees towering into prominence, and the mountain has the trimmed and symmetrical appearance of a nursery. The brooks are tamed, dammed, and made to earn their right to be as the servants of the mills. Passing over the mountains and going down the Bohemian side, we are in the woods again, with the valleys free and irregular, and the brooks running according to their own will. The contrast is seen again, but less marked, in going up from Bohemia and down into Bavaria. Within Germany itself the garden tilled plots near the industrial centers and the little rectangular holdings of the southwestern and middle districts, each distinctly marked off from its neighbor, and making the whole look like a party-colored checkerboard, impress one very differently from the immense fields devoted to single crops and the commodious barns of the north. Other differences may be seen on the upper Rhine, where the inhabitants of both sides were originally the same people, but have been subjected to different influences in the course of their history. The French have made their marks all over the Alsatian territory and in the towns of quite another character from the native German aspects of the Baden side.

Brought in Ballast.

A sailing vessel arrived at the port of New York a short time ago from South Africa, and a layman who asked the captain what he brought was surprised to hear that the cargo consisted chiefly of sand. "We brought it," said the captain, "not for its commercial value, but for ballast. Our cargo for this port was light, and to give the ship proper immersion we had to load her with African earth."

There are many articles in the line of raw material which may be brought into American ports free of duty, and these articles are frequently taken at ridiculously low freight rates, sometimes at only a trifle more than the cost of handling at both ends of the voyage, and they are practically ballast; but when there is nothing to transport, shipmasters frequently take earth, as in the case of the African vessel. The popular ballast, though, is stone. This is sometimes sold to contractors after the ship has come to port, and enough is realized in some instances to pay for the handling.

"Often," said a sailing master, "we begin to discharge our ballast when we get near port if the weather is favorable, and if we have no fear that we shall be too high out of the water, and by the time we tie up we have nothing aboard in that line. There are stones and all sorts of rubbish just outside of New York Harbor from all ends of the earth that came in just that way and were thrown overboard. Water ballast is carried in compartments below the floors, but it is shipped merely to stiffen the ship, while other burdens must be added to give the ship the proper immersion."

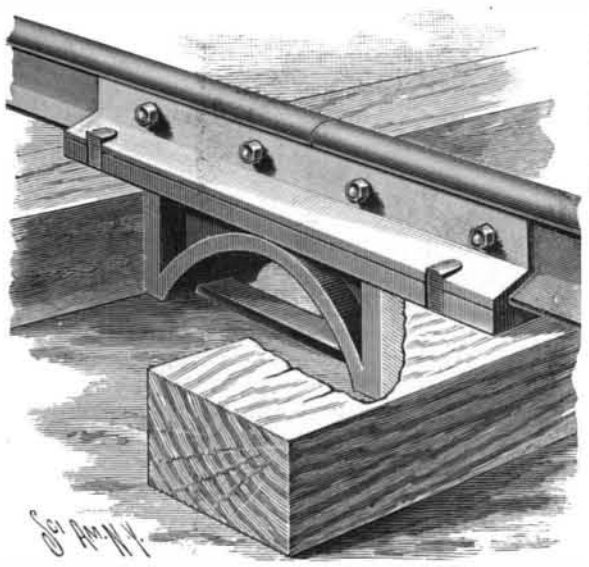
The ballast question has been a serious one for the salt producers of the United States in the course of the last few years, says the New York Tribune The laws of the country provide that salt may be brought free of duty from any country into which American salt may be shipped free, and the consequence has been that for the year ending June 30, 1896, 546,753,181 pounds of salt came to various ports of the United States free of duty. The United States exported in the same time only 9,765,552 pounds, and, while the imports amounted to $745,743, the exports brought American producers only $40,542. The salt came principally from the West Indian Islands, and was landed at many ports. Boston received 83,000,000 pounds, and among the other large amounts were the following:

	Pounds.
New York	71,000,000
Philadelphia	44,000,000
New Orleans	41,000,000
Gloucester, Mass.	38,000,000
Baltimore	36,000,000
Galveston	34,000,000
Savannah, Ga.	31,000,000
Beaufort, S. C.	21,000,000
Mobile	18,000,000
San Francisco	16,000,000
Portland, Me.	13,000,000

It was explained at the Custom House that much of this salt was used by packers of meats and fish and that a large quantity went back to the countries from which it came in a different form.

A RAIL JOINT SUPPORT AND BEARING PLATE.

The illustration represents a support for railway rails at their joints, designed to prevent the ends of the rails from becoming battered, and thus, also, adding to the life of the rolling stock. The improvement has been patented by Woodley Brugler, of Columbia, N. J. The fish plates are of the angled type, engaging the web and flange of the rail, and the rails and fish plates are supported upon a bearing plate which extends from one tie to the other beneath the joint, the same spikes holding the fish plates, rails and bearing plates in position on the ties. To strengthen the bearing plate, however, an arch support is provided, extending between the ties, the support having integral end plates which bear against the sides of the ties as well as against the under side of the bearing plate, while the



BRUGLER'S RAIL JOINT SUPPORT.

central portion of the arch bears directly against the under side of the bearing plate. The arch is strongly made, so that it will not spread under pressure, a cross bar connecting the ends of the arch at the bottom, and the rails being thus supported to form a continuous, even tread surface at the joints.

Air and Athletics.

What the man of to-day needs most is not athletics in a gymnasium, but plenty of fresh air in his lungs. Instead of a quantity of violent exercise that leaves him weak for several hours afterward, he needs to learn to breathe right, stand right and sit right. And if the woman who spends so much time and strength getting out into the air would dress loosely and breathe deeply and so get the air into her, she would have new strength and vigor, and soon be freed from many aches and pains and miseries.—H. L. Hastings, in the Phrenological Journal.

"Is there such a thing as intrinsic value?" the Mining and Scientific Press asks. Certainly. It is intrinsic qualities which give intrinsic value. Generally, what is meant is that the article embodies in the form in which it is offered for sale, not only original intrinsic qualities, but the actual labor and expense of its production. It is a term, however, which is applied in many different ways, and often is used when "exchangeable value" is meant. An article may have intrinsic value and yet have no exchangeable value. Water is one of the necessities of life, but it is usually so easily obtained that it has no commercial value. A man will be slow to give up a thing, which has cost him labor, for water, when he simply has to dip it up or stoop down and drink. The moment, however, that water has to be forced long distances to places where it is needed, it immediately possesses both intrinsic and exchangeable value. The cost of transportation may add to the value of an article just as surely as labor.

Science Notes.

Fontainebleau's great grapevine produced 7,672 pounds of grapes this year, which when recently sold at auction brought $715.

While excavating for a pond on the farm of L. V. Harkness, near Donerail, Ky., recently, workmen discovered the bones of a mastodon.

Lord Kelvin has received from the Paris Académie des Sciences one of its Arago medals in honor of his jubilee, and M. d'Abbadie, the Abyssinian explorer, the other.

It is proposed to erect a tablet in honor of Prof. Giuseppi Sanarelli, the discoverer of the microbe of yellow fever, at the University of Sienna, of which he is an alumnus.

The Silesia Verein Chemischer Fabriken, at Woischwitz, near Breslau, provides carbonic acid water for its employes during the summer. The families of the workmen are also supplied freely with this water.

Vaccination laws are not enforced in England. At Norwich, with a population of over 100,000, the vaccination officer's fees this year amounted to about $40; he receives 50 cents for each case.

Three Italian physicians, Drs. Lustig, Galeotti and Malenchini, have returned from Bombay with a preventive serum for the plague, which they assert is superior for the purpose to Dr. Yersin's. It is not intended to cure but to prevent the disease, is more easily prepared than Yersin's, is free from bacteria, dry and harmless to man and beast. It is introduced by injection in small doses mixed with sterilized water, producing a slight local rash, which disappears in twenty-four hours. The doctors tried it on their own persons.

That certain beetles are by no means frightened by lead foil has long been recognized, but it is rather discouraging to add one more to the number of these culprits. Ed. Stich, of Nauheim, reports that a box somewhat worm eaten was lined with lead. After awhile holes one-eighth of an inch in diameter, and distinctly spiral, were noticed, and traced to the beetle Tetropium luridum, Linn., which was not yet on the list of lead eaters, or rather lead destroyers. A cousin of this insect has been known to be destructive to lead chambers. There are, unfortunately, many insects and animals devoid of that sense for the sacred rights of property which we expect of everybody but ourselves.

The bones of a prehistoric monster have been discovered on a large farm about a mile south of Batavia. While Philip and George Baker, dairymen, were digging a grave for a dead horse, at a depth of about three feet the shovel struck an obstruction which, on being pried up with a rail, was broken. It turned out to be an ivory tusk in a splendid state of preservation. A portion of the tusk is of the consistency of chalk. One end of it, however, was not injured, and was of solid ivory. It is five feet in length, about five inches in diameter at the widest end, and at the point about two and a half inches. A portion of a rib, about thirty-six inches long, was also found. Dr. E. E. Snow, who has traveled extensively in Africa, pronounced the tusk that of a mastodon.

Some interesting observations concerning the physiological effects of electric currents have been made by M. Dubois. He finds that the effect depends much more upon voltage than upon intensity. With the same voltage, for instance, a fall of the resistance from 270,000 to 72,000 has no effect, at least as far as the minimum of perception is concerned. But a profound effect is produced by the insertion of external resistances, owing to their self-induction. Even the most non-inductive resistances have a marked effect. The inductance of the human body is practically zero, and hence the great difference produced by the slightest internal inductance. But the effect of an external resistance may be compensated by inserting a capacity in the circuit. In one case quoted a capacity of 0·0045 microfarad re-established the physiological effect which had been canceled by the insertion of a resistance of 600 ohms.—Dubois, C. R., No. 2, July, 1897.

The Committee on Indexing Chemical Literature has presented its fifteenth annual report, which states that a bibliography of the metals of the platinum group, 1748–1896, by Prof. James Lewis Howe, and a review and bibliography of metallic carbides, by Mr. J. A. Mathews, are ready for publication. A bibliography of basic slags has also been completed by Mr. Karl T. McElroy. The second edition of Dr. H. Carrington Bolton's catalogue of scientific and technical periodicals, 1665–1895, which contains 8,603 titles, will shortly be published, and a supplement to the select bibliography of chemistry, by Dr. Bolton, has been completed. The latter contains about 9,000 titles, including those of many chemical dissertations, and is brought down to the end of the year 1896. Progress is also being made with indexes to the literature of thorium and tantalum, a bibliography of oxygen, and a bibliography of the constitution of morphine and related alkaloids.

Influence of Mountains in Producing Dark Color Forms.

BY PROF. A. S. PACKARD, IN THE INDEPENDENT.

It is well known that insects, more especially moths and butterflies, inhabiting Alpine slopes or mountain regions are darker than individuals of the same species, or of allied species, living on the drier and warmer lowlands. We have been struck with the numbers of black moths and butterflies to be seen in Alpine valleys of Switzerland, while dark or melanotic individuals occur in the White Mountains and on the Labrador coast. It is also the case with beetles. Leydig was, perhaps, the first to point out that variation toward greater darkness of coloring, the tendency to become black, is connected with the action of moisture. Eimer, in his "Organic Evolution," has shown that elevation has, besides moisture, been the cause of melanism, which he has noticed in the case of the slug (Arion). On all the mountains which he explored, e. g., the Black Forest, the Harz and Rigi, the greater number of the specimens, or even all, were dark, almost black. And he adds that only two causes, apart from moisture at high levels, seem to him possible, e. g., either light or decreased atmospheric pressure. Previous, however, to Eimer, Dr. Weinland, who lived some years in this country as a collaborator of Agassiz, observed melanism in various animals, and stating in 1876 that Arion, on the heights of the Alb, near his own home, was usually dark, makes the following statement:

"It might be said that darker pigment is always produced on mountains, as in Vipera prester, the black mountain variety of Vipera berus, as in the black rattlesnake of the White Mountains, in North America."

Another factor is evidently cold, as well as moisture and elevation, as proved by recent temperature experiments of Weismann, W. H. Edwards and, more recently, Merrifield. This subject was brought to our attention while walking along a road in Madison, N. H., in which lay dead a remarkably black striped, or garter, snake (Eutænia sirtalis). On each side of the narrow dorsal dull greenish-yellow line were two black bands about a quarter of an inch wide. We have never seen on the lowlands and coast of Maine and Massachusetts a snake of this species with such a preponderance of dark markings or wide bands. Near this was also seen a dead young milk snake, probably, like the other, run over by a carriage. It was about sixteen inches in length, and darker than the Osceola doliata var. triangula figured by Cope in his "Factors of Organic Evolution;" and the inside of the black wings along the back was filled with brown-black, thus forming large blackish-brown patches. On seeing these apparently melanotic snakes, which may or may not prove to be peculiar to the White Mountains region, for a melanotic garter snake has occurred in Tennessee, according to Cope, we recalled the statement of Weinland in reference to the dark mountain viper of Central Europe, and the black rattlesnake of the White Mountains. A day or two after returning to Intervale, N. H., we heard that a rattlesnake had the week previous been seen by a lady on Mount Surprise, near the farm of Mr. Durgin Eastman, who killed the creature. On visiting him we were told the snake, which was three feet nine inches long, and with seven rattles, had been buried. Exhuming it, the specimen was found to be very uniformly black on the upper side, becoming toward the tail spotted with still darker ocellated spots, while the under side of the body was whitish as usual. It was surprisingly dark, or melanotic, and evidently forms a remarkable local variety, or color form, which merits more notice than has been bestowed upon it by our herpetologists. It is quite apparent that this is a true melanotic variety, the variation having been caused by altitude, cold and moisture. These same factors apparently operate in producing unusually dark local varieties of the other snakes of the White Mountains region. Our Eastern rattlesnake (Crotalus horridus) has a wide geographical range, extending from the New England States and Canada to near Florida, and westward to central Kansas; and yet Cope, who has made a special study of the variations of our American snakes, remarks that it scarcely varies at all, apparently overlooking Weinland's back variety. In the low mountains just south of the Catskills we have been told by an observing woman that the rattlers there are of the usual grayish or dirt color.

Apropos of this snake in the White Mountains it is more abundant than we had supposed. We were told that on or near Bartlett Mountain, near Kearsarge village, a rattler was killed two years ago, and a man had been known to kill between one and two hundred, or at least four or five snakes a day, for the sake of the oil, each snake yielding about two ounces. They were, until a few years since, seen quite often on the mountains. In this region it is very sluggish and not dangerous.

Since writing the foregoing lines we have seen a finely stuffed rattlesnake, killed at Tiverton, R. I., in August, 1896, now in possession of J. M. Southwick, curator of the museum at Roger Williams Park, Providence. The snake is fully three and a half feet long, with eleven rattles, and though darker than those of the Middle and Southern States, it is ash-gray between the blackish circular bands, the latter irregular, but averaging about three-quarters of an inch to an inch in width; it is dark on the tail. The White Mountains individual, in the state we saw it, did not present any appearance of alternating light and dark, circular bands, the entire dorsal region being uniformly blackish-brown, almost black.

A FLOATING DRY DOCK FOR HAVANA.

On September 15 the New York newspapers announced that the Spanish authorities of Havana had a perplexing problem to solve. The floating graving dock which had been completed for the Spanish government by Swan & Hunter, of Wallsend, England, was found to draw too much water for the bay of Havana; so a dredger was ordered by cable from the United States, with instructions to send it immediately "at any cost." There are several difficulties in the way of providing a dredge in short order, as it would be necessary to know more of the nature of the bottom of the bay. Since Havana was founded, in the sixteenth century, no one has ever dredged the bay. The result of this unforeseen hindrance is serious, as the dock will soon be towed into Havana.

Wherever fleets of vessels congregate there, of necessity, docks are required. They are of two kinds, wet and dry. The latter may be divided into two classes—stationary and movable or floating docks. One of the earliest records of the floating dock we have dates from the year 1776, in which year a shipwright constructed in the Thames a floating dock of timber which was used for the repair of vessels. In 1785 another dock was constructed with an end gate which was lowered to admit a vessel and afterward raised, and the water pumped out of the dock. It is stated that prior to these dates—in fact about the time of Peter the Great—a north country captain in the bay of Cronstadt, wishing to repair his vessel, found an old hulk floating in the bay, and arranged means for letting in and pumping out the water, so as to form a floating dock. The name of the hulk was the "Camel," and to the present day a contrivance for raising and lowering weights in the water by attaching them to watertight iron or wooden boxes which can be emptied or filled with water at pleasure is in frequent use by engineers, the box being called the "camel."

The essential characteristics of the floating dock are that it shall be possessed of sufficient buoyancy when required to float both itself and the vessel placed upon it, and that its construction shall insure its stability when floating both with and without its load, while it must also be sufficiently rigid in construction to afford efficient support to the inclosed vessel at all points, resembling in the latter respect a fixed graving dock.

The floating graving dock for Havana, which was launched on August 28, is a new type only recently introduced by the engineers, having been first described in a paper read by Mr. Lyonel Clark, of the firm of Clark & Standfield (the inventors of this type of floating graving dock), before the Institution of Naval Architects at the Hamburg meeting last year. It is a compromise between a graving and a floating dock.

A graving dock, simply described, is a recess excavated in a foreshore, lined with masonry, and closed at its entrance by a movable gate. The excavation is allowed to fill with water and the vessel is hauled in. The end gate is then closed and the water pumped out, leaving the bottom of the vessel dry. It is usually constructed of masonry, but it might be built of steel, and if the invert were of sufficient strength as a girder to carry a vessel on its middle, such a dock would be independent of the support of the ground, but might be made a floating dock. That belonging to the British government at Bermuda is a floating dock of this description, one of the disadvantages of which is that, since the bottom of the ship can only be got at by removing the water from around it, the height of the gates which close in the pound in which the ship is placed must as a minimum be equal to the draught of the ship, and when the pound is empty they have to withstand the external water pressure, so that they must be heavy and powerful structures; and besides, from economical and engineering reasons which need not be detailed here, this type of dock is sometimes very unsatisfactory.

A floating dock is merely a watertight box or pontoon into which water can be admitted or pumped out as required, the ship being lifted or supported simply by the displacement of the pontoon, which consequently must be sufficient to carry the weight of the ship, that of the pontoon itself, and the weight of the walls of the floating dock. This requires a depth of water which is sometimes unattainable. The floating graving dock built for service at Havana effects a compromise between the graving and the floating dock, and combines in a single dock the advantages of both types. It is an ordinary two-sided floating dock of an over-all length of 450 feet, with a lifting power of 22 tons per foot run, and in respect of large merchant vessels there are no gates at the ends to prevent a ship of a greater length than 450 feet overhanging to any extent. The Havana dock is of the minimum length, and consequently of reasonable first cost, while the ships repaired by it are, as regards position, dealt with in the most convenient and favorable manner. There is the economical advantage, too, that the cost of lifting a ship is proportional to its weight.

However, in addition to this, it may be made to lift ironclads of a unit weight of more than 22 tons by being converted into a dock of the Bermuda type, by closing in its ends by means of gates, or rather caissons, and removing the water from the pound formed by the sides of the dock and these caissons, for which latter various positions have been arranged, so that they may always be placed close up to the bow and stern of the vessel, no matter what its size, within the limits of 450 feet, thus fulfilling the condition that the lifting power of the dock should only be applied directly under the ship, and that the lifting power of the dock per foot run should always be equal to the weight of the ship per foot run. The advantages thus possessed by the new type of Messrs. Clark & Standfield are reasonable length and reasonable cost, minimum expenditure of pumping power in lifting vessels, and equal facilities for lifting merchantmen or ironclads, while all vessels lifted are placed on a platform either above or only a foot or two below the water level, thus enabling repairs to be done under the best conditions as regards light and air. The advantages of a floating dock over a fixed graving dock are obvious, but this new type happily combines the chief advantages of both.

The following is the official description of the dock. The floating graving dock was built to the order of the Spanish Colonial Office, for use in the island of Cuba, at the port of Havana, having been rendered absolutely necessary since the recent insurrection in Cuba, since the Spanish government has to maintain a somewhat large fleet in the waters of the Gulf of Mexico, and it is absolutely necessary to dock, clean and paint these vessels at regular intervals. The type of floating dock accepted by the Spanish authorities is the latest improvement in this class of structure, and consists of three portions: (1) The pontoons, or body of the dock, affording the required buoyancy; (2) the high sides or walls, regulating the descent of the pontoons below the water, and also affording the necessary stability; and (3) the movable caissons or gates, they are only used when it is required to increase the lifting power of the dock. The length over all of the dock is 450 feet; the clear width between the broad altars, 82 feet; the depth over the sill, 27 feet 6 inches; the draught of water under these conditions being 42 feet 6 inches and the freeboard 4 feet 2 inches. The pontoons are five in number, the three middle ones being rectangular in shape, and the two end ones being finished off in the form of a point. The width of all the pontoons is 87 feet 11½ inches, the length of the rectangular ones is 75 feet and that of the pointed ones 108 feet 4 inches. There is a space of 2 feet between each pontoon. They are separate from and lie wholly between the two walls, to which they are strongly bolted. The extreme breadth of the dock is 109 feet.

The deck is constructed throughout of mild steel of the quality usually employed for shipbuilding purposes. Each pontoon is divided into four watertight compartments, and each wall is divided below the engine deck into five watertight compartments, so that the entire structure is divided into not less than thirty absolutely watertight spaces. Each of these compartments can be emptied of water by means of an electrical pumping installation. This consists of two generating plants, one in each wall, but with connecting cables, so that either can serve the whole dock. Each plant is complete with boiler, engine and direct coupled dynamo. The power is transmitted by cables to ten electric motors, five in each wall, having their switches and resistances located in the valve houses. These motors are vertical and drive direct on to the shafts of the horizontal centrifugal pumps placed in the bottom of the walls. The pumping machinery is capable of lifting an ironclad of 15,000 tons weight in two and one-half hours, which means that 15,000 tons of water must pass through the pumps before the process of lifting is complete. The whole of the electrical machinery has been supplied by Messrs. Scott & Mountain, of Newcastle, and it includes a complete system of electric lighting throughout the dock. In order to render the dock efficient and suitable for lifting short heavy vessels such as ironclads, a caisson is fitted at either end of the dock. These caissons are so adapted as to be adjustable to various lengths of vessels, the greatest distance apart being 383 feet and the smallest 350 feet, these lengths representing the longest and shortest armored vessels of the Spanish navy.

Another important feature in this dock is the arrangement by which any portion of it can be examined, repaired, cleaned and painted. Each pontoon can in turn be detached, lifted and hung up on the side walls, and there any necessary work can be executed. The underneath portion of the walls may be exposed for cleaning and painting by careening the structure. The dock is thus what is now termed self-docking. The dock itself will during the passage across the Atlantic be manned by a captain, officers, engineers