

WIND'S GREAT GEOLOGICAL POWER

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THOSE who live in the well-watered portions of the world, where rich vegetation covers the surface and protects it from the denuding force of the wind, can have little realizing sense of the effectiveness of this ever-active geological agency. Yet even in some well-watered regions dunes are familiar phenomena. Dunes are simply "drifts" of sand, closely resembling the snowdrifts of winter and protection against them is secured by similar means. As in snowy regions one sees long lines of close board fences some distance from the windward side of the railroad to stop the drifting snow on its onward career, so he may in many places see wind-breaks to stop the drifting sand. But in many cases where the windbreak is not sufficient a constant force of workmen is necessary to remove the sand from the track at stated intervals or after every unusually severe storm. At such places the railroad companies, to their sorrow, learn the enormous power of this constantly acting geological force in transferring finely comminuted earthy material from one place to another.

One of the best known localities for observing dunes is found on the southeastern shore of Lake Michigan. Nearly all, if not all, the railroads approaching Chicago from the east pass through this series of dunes as they come around the southern end of the lake. Many of the dunes are very fresh, with no covering of vegetation, and rise, like snowdrifts, 50 feet or more above the general level. Others are of such age that they have been covered more or less with vegetation, trees of considerable size being found upon them. But in all cases the action of the wind, in moving the sand southward from the lake, is evident. The wind blowing from the north keeps an exposure of bare sand upon that side and drifts it over into exposures of equally bare sand upon the outer margin. The width of this belt of dunes around the south end of Lake Michigan averages a little more than one mile. The material, being clean-washed sand, is unfit for agricultural purposes and the area is occupied by very few houses, and those mostly belonging to railway employees.

The source of the material of which these dunes are composed and the rate of its movement are subjects of great interest. The sand is derived, in the first place, from the shores of the lake farther north, which are constantly being eaten into by the waves and currents. All along the western shore, from Evanston to Racine, the waves are wearing away the shore at an average rate of three or four feet per annum. The material that falls into the lake from the bluffs thus eroded is worked over by the waves until the very finest particles are washed out and floated into deep water, while the sand remains near the shore and is gradually washed southward by the prevailing currents. Everyone in Chicago knows how land is forming on the shore, giving rise to legal contests as to ownership. From observations of the United States engineers it was found that 129,000 cubic yards of sand were annually stopped by the two piers which were extended out into the lake to deep water. This vast amount represented, however, but a fraction of the whole amount of sand that was being carried by the currents past Chicago to the south end of the lake.

On reaching the south end of the lake the sand is washed up by the waves during storms and left for a considerable portion of the year exposed to the action of the winds, which have drifted it out into the belt of dunes, with which so large a portion of the traveling public is familiar. But, owing to the fact that the prevailing winds of this region are westerly, the largest accumulation of dunes is found upon the east shore, in Michigan. Travelers upon the Michigan Central railroad cannot fail to have noticed these great drifts of sand, nearly 100 feet high, at Michigan City. This belt of dunes, about a quarter of a mile wide, rising sometimes to more than 100 feet in height, extends northward all along the shore, being especially prominent at St. Joseph and Grand Haven. In many places they threaten to overwhelm whole villages and to compel the railroads to remove their tracks to get out of the way of the drifting material, while in some cases houses and forests have been completely buried out of sight.

It has been profitable to dwell thus fully upon the dunes around the southeastern portion of Lake Michigan, not because they are the largest or the most conspicuous in the world, but because they are the most accessible and the best known to the people of the United States. In some respects a still more interesting belt of dunes occurs in western Nebraska, stretching nearly across the northern part of the state, approximately parallel with the course of the North Platte river, but at a distance of many



SAND DUNES SOUTH OF LAKE MICHIGAN

miles from it. This consists of a belt of sand hills a half-mile or so in width, which is slowly traveling eastward across the state. The prevailing southwest winds are constantly blowing the material from that side and drifting it over onto the northeastern side, thus gradually shifting the line of the belt. So irregular are the drifts, however, that innumerable hollows are left between them, and so slow is the movement that vegetation covers their slopes and water is preserved in them; hence they furnish favorite centers for ranchmen.

The source of the material of this traveling embankment moving so majestically across the western plains of Nebraska and the manner of its movement are even more interesting than the similar phenomena around Lake Michigan. The sand of which this belt of dunes is composed is probably derived from the trough of the Platte river, where during the great floods of a former period it had been brought down from the Rocky mountains and deposited along the banks, whence it was lifted by the winds and started upon its victorious career over the uplands of the interior. The whole movement is exceedingly slow, but it is easily perceptible, especially to those who have built their houses and cultivated their gardens upon the eastern side. But when one considers the vast amount of material that is being transported by the wind along this entire belt the movement is majestic in the extreme.

The arid lands of Utah and Arizona and other portions of the great west afford innumerable illustrations of the activity of wind in drifting sand into regions distant from its original source of supply. The desert of Sahara, Arabia and the region about the

Red sea are covered with such moving drifts, but most attention has been attracted to them in the more thickly settled portions of Europe, where they have occasioned the population an immense amount of trouble. The coast of Norfolk, in England is fringed with sand hills 50 or 60 feet in height, where in more than one instance whole villages and ancient churches have been buried by the material. In Eccles the village church in 1839 was almost completely hid by the drifting sand which enveloped it, while 30 years later the same wind which

had buried the church uncovered it and exposed it to view upon the other side of the dune. The churches of St. Piran and Gwithian in Cornwall passed through similar experiences, while in 1668 a part of Santon (Sandtown), near Thetford, was overwhelmed by sand which had been slowly blown in from five miles to the west. In the course of a century this dune had traveled four miles and spread over 1,000 acres of land.

The northwestern coast of France is especially exposed to the destructive movement of dunes. On the coast of Gascony "the sea for 100 miles is so barred by sand dunes that in all that distance only two outlets exist for the discharge of the drainage of the interior. As fast as one ridge is driven away from a beach another forms in its place, so that a series of huge sandy billows, as it were, is constantly on the move from the sea margin toward the interior."

The entire coast of Flanders and of Holland and northern Germany is girt with these drifting sand hills. In Holland they sometimes rise to a height of 260 feet, but average only from 50 to 60 feet. Dunes of smaller extent also line the western shore of Ireland and Scotland, but on the Dutch coast they are sometimes as much as five miles wide. On the exposed shores of the Bay of Biscay, where vegetation has not had time to protect them, they are traveling inward at the rate of 16 feet per annum, while in Denmark they are in some places moving as fast as 24 feet per annum. The only method of protection against them, which, happily, is partially successful, is to plant pine forests, which readily grow in the sand and through the production of turpentine become the source of considerable revenue.

Where Our Dolls Are Made

Some Factories in America, But About \$2,000,000 Is Contributed Yearly to Foreign Makers.

Dolls have amused the world for ages, and seem to have been well known in the days of the Pharaohs, for, in the tombs of ancient Egypt, figures of painted wood, of terra cotta, of ivory and of rags have been found whose limbs were made movable for the delight of children.

In the ruins of Etruria similar toys have been discovered, and in China, as well as in India, movable figures were made to act from time immemorial by hand and on strings, or as shadows behind a curtain.

The ancient Greeks were experts in the manufacture of puppets, including wax dolls, and several of their poets allude to offerings of dolls to Artemis and Aphrodite, made by maidens before their marriage.

Dolls were evidently first intended to amuse children, but the adults soon adopted them as a source of entertainment. Puppet shows were all the rage in Europe in the sixteenth century, arriving at such perfection that the performances rivaled in attraction those of living actors.

In Covington, Ky., is the largest doll factory in the United States, and there are many other establishments in the eastern states. But the most dolls, and we are sorry to have to say it, the best dolls, are imported, and the American children contribute about \$2,000,000 every year to Europe for dolls.

There are some very fine dolls made in England; but the very finest come from France and Germany, and they are made with a degree of perfection most surprising. Even cheap dolls can close their eyes and say "papa" and "mamma." For a little more money you can buy a creeping doll or a walking doll. Then there are dolls that sing—only the music, of course—and the very latest doll is provided with a photograph, and will recite prose and poetry.

Germany is famous for the manu-

facture of toys and dolls, and the small town of Sonneberg, in the Thuringian forest, alone produces articles for the amusement of children to the value of \$150,000 yearly.

German ladies are expert doll dressers, and there is a yearly Christmas exhibition of dolls at Berlin. A great deal is made of the Berlin doll exhibition, and society turns out in large numbers to patronize it.

There are whole towns in Germany that do little else but make dolls for American children. They are mostly simple country folk. They get small pay for making even an excellent doll, but it must be remembered that their wants are few.

Family Study Valuable.

Speaking to the students in an English women's college, an educator said: "Dig out all your family skeletons. Your relatives will probably be annoyed, but dig them out and face them. Make out your pedigree, tracing your family back to your great-grandfathers and their brothers and sisters. By this means you can learn what traits to avoid and what diseases to guard against. It takes time, tact and temper to hunt back to the record of one's family, but it is worth it. Two men may seem the same, yet one may hand down disease and crime to his descendants, while the other may hand down only those qualities that are good."

What They Will Do.

The members of the graduating class of Wellesley college are 284 in number and of these only eight will admit that they plan to marry when school days are over. Eighty-six of them expect to become teachers, two will be professional farmers, nine will do religious and charitable work, six will adopt literary careers and three will travel, only one expecting to take up domestic science. It is said that but few of the 88 expecting to teach really care for this kind of work. Sixty-three of the class will simply stay at home.

THE REAL WRENCH.



Smith—It's mighty hard to get a wife.
Hardup—It's no trouble to get one, but it's hard to keep her.

Have You a Baby?
Every woman knows how imperative it is that baby's things should be absolutely and perfectly clean. She knows the trouble she has with certain yellow soaps that leave the dirt in and often make the little garments harsh and irritating to baby's skin. Easy Task soap—you can get it of your grocer—is the quickest and safest cleanser made; it is antiseptic—and it reduces the work of washing by half.

Her Excuse.
"Why—er—yes," Miss Goodley admitted, "perhaps you did hear me telling the minister I was only twenty-two."

"Oh, I'm surprised!" exclaimed Miss Gaddiet, "and you a Sabbath school teacher, too!"

"But," Miss Goodley protested, "the minister has told us it's always better to understate a thing than to exaggerate."

A Sample Box of Resinol Ointment Was Nearly Sufficient in This Case.

Enclosed find money to pay for Resinol. Just the sample you sent has almost cured Eczema on my little girl's face. I will gladly tell my friends of the great merits of Resinol.
Mrs. Emma B. McConkey,
Hacker Valley, W. Va.

Limit to Woman's Suffrage.
Women have obtained the right to vote in Krain, a province of Austria. They will be allowed to cast their ballots in person and not by proxy. There is, however, one limitation imposed on them. A special time of the day has been allotted to them for the exercise of this right.

Important to Mothers
Examining carefully every bottle of CASTORIA, a safe and sure remedy for infants and children, and see that it bears the Signature of *Dr. J. C. F. Hatch*. In Use For Over 30 Years. The Kind You Have Always Bought.

Not in the Agreement.
Daniel had been cast into the lions' den.
"My main objection," he said, as he playfully tweaked a lion's mane, "is that I get no moving-picture royalties."—Puck.

Hearsay Evidence.
Mrs. Frost—How's your husband?
Mrs. Snow—The members of his club say he is looking splendid.—Life.

Red, Weak, Weary, Watery Eyes.
Relieved by Murine Eye Remedy. Try Murine For Your Eye Troubles. You Will Like Murine. It Soothes. 50c at Your Druggists. Write For Eye Books. Free. Murine Eye Remedy Co., Chicago.

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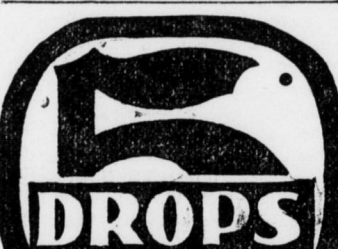
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DR. S. D. BLAND
Of Brewton, Ga., writes:

"I had been a sufferer for a number of years with Lumbago and Rheumatism in my arms and legs, and tried all the remedies that I could gather from medical works, and also consulted with a number of the best physicians, but found nothing that gave the relief obtained from '5-DROPS.' I shall prescribe it in my practice for rheumatism and kindred diseases."

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"5-DROPS" can be used any length of time without acquiring a "drug habit," as it is entirely free of opium, cocaine, alcohol, laudanum, and other similar ingredients.

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SWANSON RHEUMATISM CURE COMPANY,
Dept. 50, 140 Lake Street, Chicago.



If you are a business man, did you ever think of the field of opportunity that advertising opens to you? There is almost no limit to the possibilities of your business if you study how to turn trade into your store. If you are not getting your share of the business of your community there's a reason. People go where they are attracted—where they know what they can get and how much it is sold for. If you make direct statements in your advertising see to it that you are able to fulfill every promise you make. You will add to your business reputation and hold your customers. It will not cost as much to run your ad in this paper as you think. It is the persistent advertiser who gets there. Have something in the paper every issue, no matter how small. We will be pleased to quote you our advertising rates, particularly on the year's business.

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to the public through the columns of this paper. With every issue it carries its message into the homes and lives of the people. Your competitor has his store news in this issue. Why don't you have yours? Don't blame the people for flocking to his store. They know what he has.

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issue will prove a welcome visitor to every member of the family. It should head your list of newspaper and periodical subscriptions.

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FRESH BREAD,
PIES,
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Daily Delivery. All orders given prompt and skillful attention.

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If you are in business and you want to make more money you will read every word we have to say. Are you spending your money for advertising in haphazard fashion as if intended for charity, or do you advertise for direct results? Did you ever stop to think how your advertising can be made a source of profit to you, and how its value can be measured in dollars and cents. If you have not, you are throwing money away. Advertising is a modern business necessity, but must be conducted on business principles. If you are not satisfied with your advertising you should set aside a certain amount of money to be spent annually, and then carefully note the effect it has in increasing your volume of business; whether a 10, 20 or 30 per cent increase. If you watch this gain from year to year you will become intensely interested in your advertising, and how you can make it enlarge your business. If you try this method we believe you will not want to let a single issue of this paper go to press without something from your store. We will be pleased to have you call on us, and we will take pleasure in explaining our annual contract for so many inches, and how it can be used in whatever amount that seems necessary to you. If you can sell goods over the counter we can also show you why this paper will best serve your interests when you want to reach the people of this community.

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