BIG GLACIAL RIVERS proaching each other from Ohlo and Michigan, two gravel ridges come nearly together at Fort Wayne, leav-

DRAINED THROUGH GREAT LAKES TO THE STREAMS.

OLD BOUNDARIES ARE TRACED

Expert Wright Tells Where the Work of the Prehistoric Period Orig-Insted and Ended-Bodies of Water Enlarged.

BY G. FREDERICK WRIGHT, A. M., LL, D. (Author of "The Ice Age in North Amer-ica," "Man and the Glacial Pe-riod," Etc.)

(Copyright, by Joseph B. Bowles.) Ice is a rock. At any rate, so long as it lasts it performs all the functions of rock. As one steams up the Yukon river he will often see ahead of him a forest growing upon a high bank with precipitous face which at first sight would seem to be the enduring rock of the region. But upon near approach it will turn out to be an ice cliff covered with a few feet of soil which has been washed out upon it in sufficient quantity to support vegetation. Large forests are growing upon the Malaspina glacier in Alaska, several miles back from its front, and where the ice is 1,000 feet thick under it. In numerous places in the vicinity of existing glaciers large streams of water may be found running both upon the surface of the ice and along a high elevation between the ice and the adjoining highland or mountain chain which hems it in. Large lakes of water are also found at high elevations where they are held in by ice barriers. Where these barriers suddenly burst through, as they some-times do, tremendous floods of water devastate the valley below. The Matt-mark See, in Switzerland, and other bodies of water held up behind alpine

glaciers have been a menace.

But great as are the direct effects upon the drainage, of ice of existing glaciers, those brought to light by study of the glacial period in North America surpass them all in wonderful measure. Naturally the accumulation of ice during the glacial period began at the north, and early clogged up the great lines of drainage which lead in that direction, while, after the ice had reached its farthest limit and began to melt back, the northerly direction of the drainage could not be resumed until the ice had all melted away. Thus for long periods the drain-age of the great lakes, which now passes down the St. Lawrence river, was turned over to swell the volume of the Susquebanna and the Ohio rivers, while all the drainage that now enters Hudson bay was turned over into the valley of the Missouri and the Mississippi. This, anyone can see from a slight study of the map, must have been the case. It has been a most interesting work to geologists to find these actual outlets of glacial drainage, and to trace the effects of this great addition of volume to the south-flowing streams of the north. In general the effects of this great

increase of the volume of the water poured into the valleys of the con-necticut, Hudson, Susquehanna, Allegheny, Ohio, Mississippi and Missouri rivers are evident in the extensive gravel terraces which line the banks of all these streams and of their northern tributaries.

The terraces of the Connecticut river have long been famous, consisting of deposits of gravel and sand risworked in various places above New York city, but spreading out into line of this great body of water, to extensive gravel deposits where the which the name Lake Warren has Hudson river comes out from the been given, can be easily traced for Adirondack mountains. The sandy plyins of Saratoga were spread out of Lake Ontario, was early chosen for

TORRENTS FROM MELTING ICE while immense streams of water were turned over into the Hudson valley through Lake Champlain and Lake George. The Champlain canal has ap-propriated a portion of this glacial channel, and passes from the lake to the Hudson river with a lockage of less than 50 feet.

Before the ice had melted from the Mohawk valley there was an enormous amount of glacial drainage car-ried off through the Finger lakes and over the higher passes leading into the Susquehanna valley. The stream passing through Seneca lake over the site of Watkins and entering the susquehanna at Horseheads was specially noteworthy; while the marks of the glacial floods in the Susquehanna val-ley are clearly seen at Harrisburg and other places farther down.

Before the ice had melted from central New York the drainage of the great lakes was held up to the level of the passes from Lake Erie and Lake Michigan leading over into the valley of the Mississippi. At first, before the ice had melted off from northern Michigan, where the lakes are united, there were several independent outlets. These can be easily traced from Lake Chaufauqua down Conewango creek

ing there an opening from the Mau-mee into the Wabash river about a mile wide, revealing an abandoned river channel, which is still almost as distinct as when the mighty current of Niagara, made its exit to the sea.

A similar abandoned channel exists southwest of Chicago, leading from Lake Michigan into the Illinois river. This too is about a mile in width, with level bottom and sharply outlined sides, through which the glacial drainage poured in even greater torrents than at Fort Wayne. For a while, however, it was merely the outlet of a limited lake at the south end of Lake Mfchigan. But as the ice retreated from the lower penisula of Michigan it uncovered a channel from Saginaw bay into Lake Michigan 100 feet lower than that at Fort Wayne. Whereupon the water was diverted from that channel and all carried away by the Saginaw bay. Lake Michigan and Chicago river outlet. The shore line of the glacial lake formed at this stage of glacial recession can be traced as distinctly as a railroad embankment the entire distance from the vicinity ters of Saginaw bay, where it opens by a perfectly distinct channel into Grand river. Euclid avenue, in the city of

of Buffalo around the south and west shores of Lake Erie to the head wainto the valley of the Allegheny, and Cleveland, is built upon this shore down French creek to a similar desti-Decor.

Outlets for Glacial Torrents-Dotted Lines Show Present Lake Boundaries.

nation, and from Grand river in Ohio | Chicago into the Illinois has availed into the Mahoning at Warrn, reaching the Ohlo, through Beaver creek, 25 miles below Pittsburg. The Ohio river all the way down is lined with gravel terraces, frequently rising more than 100 feet above the river, which furnish building sites for the most of the cities along its course. Fourth street in Cin-cinnati is on one of these terraces, 120 feet above the river.

As the ice was slowly retreating over the area occupied by Lake Erie main outlet for the ever-increasing glacial lake was through an opening at Fort Wayne, Ind., leading into the Wahash river and thence into the ing upon either bank of the river from Ohio. This outlet is 200 feet above 50 to 100 feet or more above present the present level of the lake. Consehigh water mark. In the Hudson val-ley they exist as brick clays, extensive-land on the south and west sides of the lake below that level. The shore during that stage of the glacial period, a highway and for building sites. Ap-

itself of this old outlet, the bottom of which was only about 15 feet higher than the level of Lake Michigan.

Earlier glacial outlets farther west are clearly traceable from Green Bay into the Fox river and from the west ern end of Lake Superior at Duluth through the Chippewa river into the Mississippi, a little way below St. Paul. The remarkable level gravel terraces high above the lake at Duluth, so convenient for streets and back to the Niagara escarpment, the drives, are the shore lines of this temporary lake at the west end of Lake

On Keeping Happy.

There is no doubt some selfish satisfaction in yielding to melancholy, aand fancying that we are victims of fate; in brooding over grievances, especially if more or less imaginary. To be bright and cheerful often requires an effort; and in this respect, as in others, we require to watch over and manage ourselves, almost as if we were somebody else.-Sir John Lub-

JOKE WAS ON PATROLMAN

pliffed Position.

Early the other morning several patrolmen, one sergeant and a lieutenant of police were standing near the alarm box at First and San Pedro streets. In the crowd were Bob Henderson, Frank Williams, Charlle Sc bastian and Bill Murray. The crowd was waiting for the time to ring in the regular call, and while waiting was eagerly discussing subjects of great interest to patrolmen.

interest to patrolmen.

While they spoke all were watching the antics of a small boy and a nilaerable-looking can. The pair was going west on First street, and the boy certainly had his hands full of trouble. The dog was tied to one end of a stout rope, but apparently reluctant to obey the commands of his small master, who every few minutes was compelled to stop and jerk him along.

As the pair reached the crowd of

Boy's Explanation in No Way Sim- | patrolmen the dog suddenly stopped and refused to advance any further.

"Oh, come on here, Pleceman!" shouled the boy. "Come on, an' don't be so doggon lazy."

"Here, kid," said Bob Henderson, stepping forward, "what did you call that dog?"

"Pleceman," said the dog's master. "Well, you tell me what you called that brute policeman for," said Hen-derson, "or I'll make you regret the name has ever been coined.'

"Oh, if I tell yer, why, yer'll bat me noodle off," said the boy.

"No, I won't touch you if you tell me," said Henderson, "but if you can show me how the dog deserves the name I'll give you a dime." "Sure, will yer?" asked the kid in

tone of doubt. "Honest," replied Henderson.

snekky an' an all-around 'no good

And Henderson paid the dime.-Los Angeles Herald.

Norway's Versatile Queen.

Queen Maud of Norway has innumerable hobbies and recreations, many of them being of a very useful practical nature. She many hours to sewing, wood carving and bookbinding, and in regard to the latter work has turned out some really beautiful specimens of the craft.

Like Queen Alexandra, her mother, Queen Maud is very skillful with the camera, while such is her skill in outdoor sports that she is her husband's constant companion when his majesty indulges in skating, skling, motoring and cycling excursions. At billiards Quen Maud can easily beat King Haa-kon, while King Edward, himself a very skill ul whist player, has con-fessed that he could not teach his daughter much in regard to the game.

he every few minutes was compelled "Honest," replied Henderson.

"Well, I'll tell yer," replied the lad.

As the pair reached the crowd of "Yer see he's lazy, lousy, crooked, prominent through shady practices.

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People Talk About Good Things.

Women and the Suffrage.

The severest criticism of the stupidity and inefficiency of the parliaments of the world is, in M. Marcel Prevost's opinion, the most universal indifference of women on the subject of voting. "Neither the representative nor the voter," says this expert in feminine psychology, "excites their envy. They do not even think about the vote, and if men offer it as a gift they pay no attention, burst out laughing or refuse point blank."

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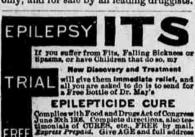
Some farmers are smaller potatoes than they raise.

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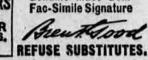
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