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SOME GEOLOGICAL FEATURES OF JACKSON PARK, CHICAGO.

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VISITORS to the great Columbian Exposition during the past season can hardly have failed to have been impressed with the beauty and harmony of the landscape features of Jackson Park. Those who have made topography a study must have found it a place of especial interest.

Only when one compares the Jackson Park of 1893 with that of former years can he realize the greatness of the transformation, or comprehend the herculean task which confronted the gardener in his attempt to bring beauty and harmony out of this wild, and from an artistic standpoint, chaotic region, or appreciate the magnificent success with which the problem was finally solved and the wild waste transformed into a place fit to be called the "Garden of the Gods."

The Jackson Park of former years, in large part a wild and unimproved morass, a succession of sandy ridges and low stretches of marsh, the resting place of water-loving fowl during their season, and the resort of game-loving marksmen, contrasted with that of 1893, with its beautiful avenues, glittering lagoons and studded islands, a dreamland of beauty in its rare combination of nature and art, surely presented a marvellous example of what it is possible for the landscape gardener to accomplish.

To understand the matter at all well, the topography of the adjacent vicinity must be studied, which at once introduces us to a very interesting geological problem.

Along the borderland of Lake Michigan in the vicinity of Jackson Park may be observed ridges running southward and diverging from the lake shore, varying in width from a few yards to a considerable fraction of a mile, and in height from that which barely distinguishes ridge from adjacent lowland to twenty feet or more; the front edge, *i. e.*, the eastern or one toward the lake, usually being more or less abrupt, while that on the opposite side not infrequently grades down to the adjacent marsh so evenly as to make it difficult to determine where the ridge ends and the marsh begins.

If the observer traverses the lake shore southward he finds these ridges occurring at irregular intervals, and if he follow one of them along its course he will soon find himself at considerable distance from the lake, and ridges rising to view both to the eastward and westward.

Examination of their structure where exposed in cellars or excavations for sewers, or perchance where a sand-pit has been opened, reveals stratification and evidence of distribution and deposition in water, with alternating layers of coarse and fine sand and gravel.

The intervals between the ridges are marsh or lowland, and during certain seasons of the year are often covered with water.

The ridges are easily recognized from a distance by the oaks which usually—and, so far as our observations have extended, always—cover them in a state of nature, a sharp tree-line marking the transition from ridge to marsh.

If from the roof of the Manufactures Building or other elevated standpoint the region south of the park be surveyed, one observes that a broad level plain stretches southward from the boundary of the park (Sixty-seventh street), toward South Chicago, Pullman, and Lake Calumet, the eye being able to trace the landscape clearly as far as about One Hundredth street. This region is seen to be traversed in a generally north-south direction by lines of trees, which, by closer observation, are found to coincide with the sand ridges.

Abutting against the southeast corner of the park there is observed a grove of oaks of considerable extent consisting of broader or narrower tree-covered belts (ridges), separated by narrow strips of lowland (lagoons), while toward the lake other tree-belts are noticed, separated by low even tracts of marsh-land of varying width, entirely destitute of trees. And again, for some miles to the westward lines and patches of trees indicate ridges or outliers, and a nearer approach reveals some very high and extensive ones.

If the grove mentioned above be examined more closely, it will be found to consist of a somewhat complicated series of ridges and lagoons.

Near Seventieth street, the first ridge in the series which we can study satisfactorily—some having been destroyed by grading—to the east from Stony Island avenue (which forms the western boundary of Jackson Park) divides to the southward, and the intervening lagoon[1] gradually widens. The ridge is quite pronounced, especially as to its front, along east of the tracks leading to the Terminal Station, and here again the second lagoon, which forms the interval between the first and second ridges north of Seventieth street, becomes narrower and presumably disappeared a short distance further north in the park. This second ridge is quite regular in outline, and transversely symmetrical. It has to a striking degree the appearance of an old-fashioned country "turnpike" road before it has been distorted by heavy wagons. It is as evenly built as a gardener could have made it with his shovel and rake, rising gradually and evenly to a height of about four and a half feet, and then as evenly, though slightly more abruptly, descending to the lowland on the east or lakeward side. It is about eight rods in width at Sixty-ninth street, two blocks south of the park fence, and is separated from the next ridge by a lowland belt at this point, about four rods in width, which, however, gradually widens southward, and narrows northward till it disappears, and the two ridges unite just south of the park limits. The highest point of the combined ridge, just above the juncture of the two adjacent edges, is about six feet.

Eastward again of this third ridge or eastern arm of the second (which is about twenty-five rods in width) extends a broad level tract of lowland of a breadth of a hundred rods, covered with a growth of rushes and other marsh plants, and so low that it is covered with water during the wet seasons of the year and furnishes a favorable haunt for wild fowl and a tempting field to the sportsman. Still further east is a broad ridge sagging

[1] The terms lagoon, lowland, and marsh-belt are used interchangeably throughout this discussion, for the low interval which separates the ridges, whether or not it be covered all or any part of the year with water.

sharply along its dorsal line to a depth of half its total height; followed by another belt of lowland eight or ten rods in width; and lastly a peculiarly irregular, low, broad ridge, which quickly terminates southward, and is bordered on the east by the present lake beach.

It seems probable from a study of this region and comparison with the park to the north, that the Administration Building stands on a continuation of one or more of the ridges just described, while the broad, low belt mentioned above has its continuance embracing that part of the park on which were located the dairy and stock barns, the Stock Pavilion, the Agricultural Building, the Court of Honor or Grand Basin, and part of Manufactures Building, together with the area covered by the South Pond. Presumably the ridge on which stands the Administration Building is one which extends northward, forming part of the Wooded Island, and, as the native oaks give evidence, extends past the site of the Turkish, osta Rica and other foreign buildings, continuing along the east end of the north lagoon and Art Annex to the northeast corner of the park.

The presence of the large native oaks on a part of the Wooded Island shows the former existence of the dry, sandy soil of a ridge, while the absence of the trees in other parts becomes negative evidence that it is filled or artificial land, as the mud which was scooped out from the low places, forming the artistic lagoons, was piled along the margins to fill sinuses and level depressions.

The presence of a few large trees near the Government Building bespeaks a ridge, and the grading of the grounds indicates traces of the same, despite the gardener's skill. But whether here was a distinct ridge on which stands part of the Manufactures and the Government Buildings, and running over toward Victoria House, or whether it was only an outlier, or whether it was a ridge at all, is involved in uncertainty.

From the Convent La Rabida a ridge seems to take its origin, on which stands also the Krupp Gun Works, part of Shoe and Leather, thence extending southward along the east margin of South Pond and west of Anthropological Building, and continuing, as the ridge described as lying east of the wide belt of lowland south of the park. The ridge mentioned as adjacent to the present lake beach and very irregular in its outline and disappearing suddenly southward, just enters the park touching the Forestry Building.

Another distinct ridge crosses the northwest corner of the grounds, on which stands the California State Building, Washington, South Dakota, the Esquimaux Village and others. This soon disappears from the grounds to the westward, the oaks in Buffalo Bill's enclosure indicating its location upon the ridge. The lagoon or pond which extends into the Esquimaux Village is probably a natural sag or lagoon scooped out deeper, but it is impossible to determine, since the grading outside the park fence has destroyed all traces.

From these observations it is seen that the lagoons of Jackson Park—those objects of so much delight and pleasure to World's Fair visitors, those gem-stones of earth in a silver setting of water, which completed the indispensible features of the perfect landscape and gave the finishing touch of beauty to this fairy dreamland of nature and art—are the excavated marsh-belts which formed the lowlands between the oak-covered ridges above described, the deep muddy, marshy or water-covered places being made deeper and the excavated material being used to fill sinuses and depressions,—in fact, that these lagoons were a necessity in the reduction of a dismal desert waste to a perfect landscape garden ; were formed because nothing else could be done with the water ; in short, the process was but one of giving back to the sea her own, the lowland belt becoming what it originally was before being filled by the processes of time—a lagoon.

We have not space to discuss the geological history of this region, but may say in closing that Lake Michigan has, at a not early time, geologically occupied many square miles of territory now embraced in part in the city of Chicago and vicinity—that a great region about the head of the lake is entitled to the Indians' appellation of "Chica-gow" or "Skunks' Nest," and that these ridges are beach-ridges successively piled up by the waves of the receding lake, and the marsh-belts are the filled and filling lagoons which are formed in such shore processes.

NOTES AND NEWS.

Two numbers of a new university publication upon geology have lately come to notice, reminding one in their form and general aspect of the bulletins of the Geological Society of America. The new publication is the Bulletin of the Department of Geology of the University of California. It is edited by Prof. Andrew C. Lawson. In the two parts of the first volume there are seventy-two pages and five plates. The articles are "The Geology of Carmelo Bay," by A. C. Lawson and J. de la C. Posada, and "The Soda-Rhyolite north of Berkeley," by Charles Palache. The new enterprise has a wide field open to it. Comparatively speaking, very little work has been done upon the geology of California, and the problems are numerous and important. Aside from the two quarto volumes upon the Geology of California, the work of the U. S. Geological Survey and the few early government expeditions, little has been done in the State. Many of the problems are so intricate that it is not to be expected that they will be solved in the short time given to them by government expeditions. The great extent of the State, and the vast variety of soils and geological formations found in it, will form fertile themes for discussion and investigation for many years to come. It is the intention of the university to issue the parts at intervals as material accumulates, and when a volume of 350 or 400 pages has been printed the subscription price of $3.50 will be requested. Subscriptions can be sent to Prof. A. C. Lawson, University of California, Berkeley, California.

—G. P. Putnam's Sons will publish immediately the first volume of "Social England: a record of the progress of the people in religion, laws, learning, arts, science, literature, industry, commerce and manners, from the earliest times to the present date," edited by H. D. Traill, D. C. L. The work is to be completed in about six volumes, and the one about to be published presents the record from the earliest times to the accession of Edward I. They also announce Le Gallienne's "Religion of a Literary Man," "Wah-Kee-Nah, and Her People," a study of the customs, traditions and legends of the North American Indians, by James C. Strong, late Brevet Brigadier-General Reserve Corps, U. S. A.

—J. B. Lippincott Co. announce another of Robert S. Ball's popular books on astronomy, entitled "In the High Heavens," to be profusely illustrated by drawings in the text and full-page colored plates.

—The large and curious philological library of the late Prince Lucien Bonaparte is soon to come into the market. It numbers about 25,000 volumes. The Prince early determined to make a collection of works which would represent not only every written language in the world, but their connection one with another, and also their dialectal varieties ; and he was able to a large extent to carry out this idea. His collection includes a specimen of every English dialect. His usual plan was to get the Gospel of St. Matthew or the Song of Solomon translated into the different dialects by experts.