

A REMARKABLE FOSSIL DISCOVERY.

BY WALTER L. BEASLEY.

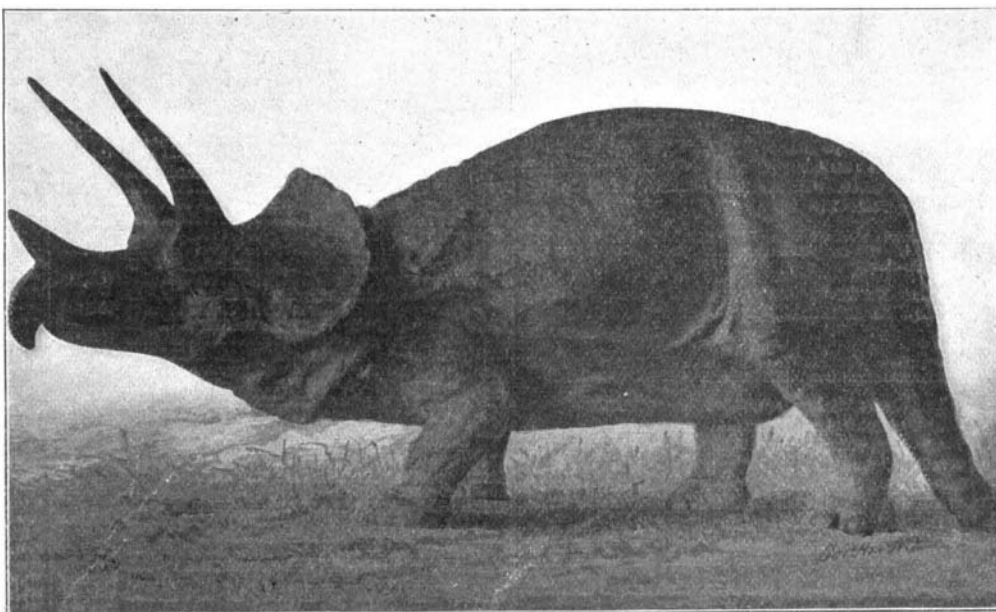
A recent fossil expedition of the American Museum of Natural History, sent out under direction of Prof. Henry S. Osborn, has succeeded in discovering the largest and most complete head of an extinct monster so far known. The find is considered a valuable contribution to science, being the record-breaking specimen of the world. The head in question was that of the mighty horned dinosaur known as Triceratops, said to have been one of the largest and most formidable

**PREPARING THE HEAD IN MONTANA FOR SHIPMENT.**

creatures which once roamed the shores of primeval earth. This gigantic reptile flourished and became extinct during the Cretaceous age, variously estimated to have been from three to ten million years ago. The enormous size and ferocious strength of the animal's head is vividly demonstrated from the astounding dimensions of the skull, which is seven and a half feet long by five and a half in width. There is a head in the National Museum in Washington which is only five and a half feet long and four feet wide. The skeleton of the animal in papier mache was exhibited at the Buffalo Exposition, based upon various fragmentary parts found. The inside portion of the skull, tipped at an angle of 45 deg., as shown in the accompanying illustration, strikingly sets off its great breadth and height in comparison with the standing figure alongside. With the exception of the upper portion of the horns, the skull was complete. The latter are to be restored. The digging up of such a large specimen practically almost intact is of unusual occurrence, and lends additional value to the find as an unequalled fossil treasure. The head was discovered by a party consisting of Mr. Branum Brown, of the Museum, together with Prof. R. S. Lull, of Amherst College, and Mr. Brooks, a recent graduate of that institution. The searchers, while reconnoitering along the banks of a small stream, a tributary of the Missouri, some 135 miles northwest of Miles City, Montana, came upon the weathered portions of one of the horns, slightly protruding above the surface. To the trained eye of the investigators this indicated fossil remains beneath or nearby, and careful examination shortly revealed the existence of the big head embedded in the sand strata below. This section of Montana, together with nearly all the area west of the Rocky Mountains, which in remote time was a great lake basin and inland sea, is now looked upon as America's vast prehistoric burying-ground, where are reposing the petrified remains of the strange and huge animals of the past. It took about four weeks to excavate and prepare the immense head for transportation to New York. This process required much skill and patience to satisfactorily accomplish. The earth was first cleared away, sufficiently enough to indicate the specimen. The whole skull was thereafter outlined and excavated by channeling around and beneath it. The sand and debris were scraped away with the utmost care from the bones. To harden and hold the remains together, and to keep the shattered sections of the skull in place, they were treated with a special chemical preparation, and cemented with glue. After being unearthed and braced by props, the upper and inside surfaces and edges of the skull were treated with several coats of plaster of Paris to strengthen and hold the bulky object firm during its long journey to New York. Three hundred pounds of plaster was necessary for this operation, being nearly the amount used in finishing the walls of an ordinary cottage. On leaving the field the specimen weighed 3,100 pounds, and required two hardy draft-horses to haul it to the

railroad station. According to Mr. F. A. Lucas, of the National Museum, the beast is said to have been some twenty-five feet in length, and about twice the bulk of an elephant, weighing ten tons or more. A vivid glimpse of the animal in life is graphically depicted by Mr. Charles A. Knight's statuette, modeled under direction of Prof. Osborn. Mr. Knight is considered the best authority on painting and rendering in clay the various prehistoric animals of the past. The huge armored head and peculiar frilled skull are shown to great advantage in his model. The formation of the teeth clearly indicates that Triceratops was herbivorous, and did not chew or grind his food, but used his tortoise-like teeth for clipping and cutting the branches, twigs, and the various forms of tropical foliage upon which he fed. For a full meal, which probably required several days, it is estimated that he would consume from two to four hundred pounds of food-stuff. Intelligence did not go in keeping with his enormous size, evidenced by his small brain, which would not more than fill a good-sized teacup. His intuition was just about enough to defend himself from attacks made upon him by the large flesh-eating Dinosaurs of his time. When drawn into combat, owing to the extraordinary size of his head, and aided by his sharp and firmly-rooted horns, he is thought to have been practically invulnerable, and was unquestionably the undisputed master of the ancient brute world. That he carried on fierce warfare is forcibly shown by the skull in the National Museum, one horn of which is broken midway between the tip and base. It is supposed that the horn was broken during life, owing to the fact that the stump is healed and rounded over, while the other horn shows that the creature lived to a ripe old age.

The fighting and savage side of the beast is, however, somewhat doubted by a few scientists, who hold that his bulky frame and slow-moving qualities indicate a comparatively peaceful animal, who fought only when set upon by enemies. In order to sustain the weighty body, the legs were short and massive. From the gradual taper of some of the skeleton parts of the tail previously recovered, it is inferred that the latter was round and did not serve for locomotion in water or balancing purposes. The various fossil expeditions planned by Prof. Osborn have probably been more successful in the size and number of specimens obtained than all other researches. Prof. Osborn proposes to supplement the unfinished labors of Profs. Marsh and Cope, who have revealed to the world the greatest series of extinct creatures, by mounting and exhibiting their specimens in New York. For the immediate working out of this problem Morris K. Jesup, Esq., has presented to the Museum the famous collection of fossil fish and amphibians discovered in Kansas, Colorado, Wyoming, Texas, and other portions of the great Rocky Mountain district between 1888 and 1896, by Prof. Cope. This new collection contains animals of all kinds, terrestrial, fresh-water, and marine, and covers the history of vertebrate life on the American continent, estimated by geologists at 17,000,000 years. Also the valuable Pampean collection, representing the Pleistocene fauna of South America, has been acquired. This was sent by the Argentine Republic to the Paris Exposition of 1878, and was purchased outright by Prof. Cope. For twenty years it has remained stored out of sight in the cellars of the Memorial Hall of

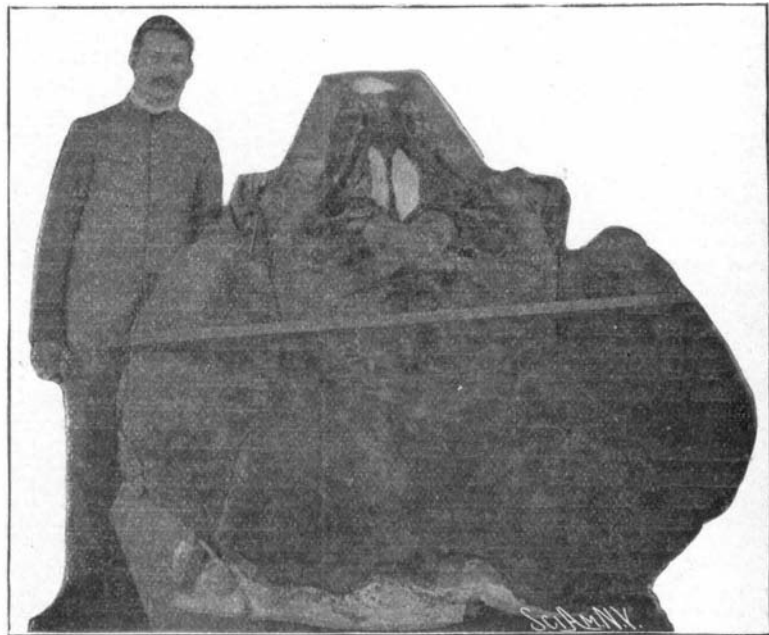
**RESTORATION OF TRICERATOPS BY C. A. KNIGHT.**

Philadelphia. Through the generosity of some of the trustees, including H. O. Havemeyer, William E. Dodge, Prof. Henry F. Osborn, and others, the collection has just been presented to the Museum. The two collections together embrace about four thousand specimens, and when mounted the combined display of extinct life will surpass that of any other museum in the world.

How Chipped Glass is Made.

The ever-increasing use of forms of glass which will serve as a screen and yet admit a maximum amount of light, makes the study of their manufacture an interesting one. The form most generally used is known as chipped glass. In the manufacture of chipped glass the second grade is used; such imperfections as blisters or pimples, called stones, do not affect the quality of the finished product. The large sheets are first placed on a platform and passed slowly under a powerful sand blast of fine white sand, such as is used in glass making. In a couple of minutes they emerge with the glaze cut from the surface, and are known as ground glass, and much is sold in this form.

The sheets are then coated on the ground surface with a high-grade glue in liquid form, American or Swiss being considered best. They are then carried to the drying room and placed on racks, where they lie flat until the glue is well dried, which takes from twelve to fifteen hours. They are then placed in the chipping rooms, which are about five feet deep by six high, and as long as the size of the building will permit. They are divided by light frame partitions into spaces sufficient to admit two sheets of glass standing on edge with the

**LARGEST FOSSIL HEAD OF AN EXTINCT ANIMAL EVER FOUND.**

Length, 7½ feet; width, 5½ feet. View of the interior.

coated surfaces outward. Coils of steam pipe run under the frames holding the glass, and when the heat is turned on, and as the glue reaches its driest point, it curls up in pieces from the size of a finger nail to a couple of inches long by an inch wide. The glue adheres so closely to the ground surface that in pulling loose a film of glass is taken with it. The result is the beautiful fern-like tracery, familiar to all who have noticed this kind of glass. About thirty-six hours is required for it to peel off clean, and thus complete the process of single chipping. For double chipping the glue is applied to the rough surface without sanding, as the surface is sufficiently rough to hold the glue. It is then passed through the same process, but the chips are smaller and break up the fern-like appearance of single chipped.

The secret of the process consists in the quality and preparation of the glue used, as none but the best will do the work. Also in having the draft and temperature right in the chipping rooms. Ordinarily a heat equal to a summer heat will do the work. The glue is cleaned and used repeatedly, as is also the sand. The sand after striking the glass falls into a pit underneath, and is carried up by the elevator.

The chipping process increases the value about half for single, and in the same proportion for double chipped. The Johnston Glass Company, of Hartford City, Ind., has a special department for this product, and ordinarily turns out about 100,000 square feet per month.

T. W. SHARP.