

Corrected Prices.

LIST OF

RELIEF MAPS,

MODELS OF

Ancient Civilizations, Ancient Monuments

CASTS OF EGYPTIAN, ASSYRIAN

Inscriptions and Sculptures.



Ward's

Natural Science
Establishment.

1011 Third Avenue,

ROCHESTER, N. Y.

PREFACE.

Relief Maps and Models have now become recognized adjuncts of all good teaching. While a flat map of a country may give a general idea of that region, yet it is quite impossible that such a map will convey the vividness of effect and exactitude of perception that is produced by the same map in relief.

We have here offered several of the more interesting geological regions most carefully modeled upon the best data obtainable. Thus the subjects of Physiography and Geology may be illustrated in the lecture room in a highly satisfactory manner, not by the use of ideal regions, but by parts of our own country copied exactly.

The fidelity of these models may be relied upon as they are identical with others made for the U. S. Geological Survey from data gathered by their elaborate surveys of these regions. The foreign maps are established upon equally exact data.

The Cliff-Houses are also copies of models made for the Geological Survey and Ethnological Bureau from data obtained by their explorations; and are truthful copies of the structures that they represent. Their importance to the Archæologist is so great that many copies have now been placed in various colleges and museums of the country.

The Archæology of Egypt, Assyria, Mexico, etc., has been touched upon in this selection by various of the most important inscriptions and monuments which these countries have produced. With the exception of three of these, all are casts from moulds

taken directly from the originals and, with few exceptions, were first brought to America by us. The reduced winged animals and the Aztec calendar are copies of reductions, made by skillful artists, of these high sculptures. By this means the student of Assyrian or Mexican lore can have these important objects in his library. In all cases great pains have been taken to copy the colors as well as the forms, thus making these models exact fac-similes of the originals which they represent.

This catalogue by no means exhausts the archæological material that we carry in stock. We have a quite extensive series of casts of rare or unique forms of pottery, etc., from various parts of the world, as well as many hundreds of actual specimens illustrating both Archæology and Ethnology.

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RELIEF MAPS.

While it is very true, as pertinently stated by Dana, that Geology is eminently an out-door science and that strata, rivers, mountains, valleys and volcanoes cannot be taken into a recitation room it is also a fact that few students can go, during their school or college life at least, to the widely separated localities where the grandest and most remarkable geological phenomena are to be found. But, if the student can not go to the mountain, the mountain must come to the student—in the form of a model to be sure, but showing all the characterizing features of the original, and showing them too in such a comprehensive manner that a few minutes devoted to its examination will give a clearer idea of geological principles than can be obtained in weeks spent at the locality itself. Besides the features shown on ordinary maps these exhibit, in relief and on a true relative scale, all the elevations and inequalities of the surface as well as the altitude above sea level of any point. Nor is this all, for, with few exceptions, they are colored so as to show the area and true relations of every geological formation that occurs in the district represented.

The data necessary for the construction of each map has, in most cases, taken years of patient labor on the part of able geologists, aided by skillful topographers and draughtsmen. Our work in utilizing the data thus secured has also been considerable. Since it must be remembered that the labor required to paint one cast, with its great detail of coloring and lettering, must be repeated with each successive cast made. And this comes after the painstaking and time-consuming operation of building up and modeling the first map and making the molds.

The prices quoted are for *plaster* maps suitably framed and boxed, and delivered at the freight house in Rochester. If the very much lighter *papier maché* copies are desired, they will be furnished at a slight additional cost.

1238 No. 1. Relief Map of Central France.

The district of Auvergne, represented by this Map, lies on the tributaries of the Loire, about 212 miles south of Paris, and is of peculiar interest. "We are presented," says Lyell, "with the evidence of a series of events of astonishing magnitude and grandeur, by which the original form and features of the country have been greatly changed; yet never so far obliterated but that they may still, in part at least, be restored in imagination. Great lakes have disappeared—lofty mountains have been formed, by the reiterated emissions of lava, preceded and followed by showers of sand and scorie;—deep valleys have been subsequently furrowed out through masses of lacustrine and volcanic origin; at a still later date new cones have been thrown up in these valleys,—new lakes have been formed by the damming up of rivers;—and more than one creation of quadrupeds, birds and plants, Eocene, Miocene and Pliocene, have followed in succession; yet the region has preserved from first to last its geographical identity; and we can still recall in our thoughts its external condition and physical structure before these wonderful vicissitudes began, or while a part only of the whole had been completed." The whole region consists in large measure of granite and crystalline rocks, and is full of vestiges of most intense volcanic action—presenting multitudes of truncated cones of scorie and ashes, apparently quite fresh, trachytic domes, basaltic colonnades and plateaus of immense extent. Some of these volcanoes (as Puy de Dôme and Puy de Sarcouy), are characteristic specimens of that class of mountains which, though volcanic, appear never to have been, properly speaking, in eruption. The material (trachyte, domite, etc.) issued from the earth, apparently, in so imperfect a state of fluidity as not to run, but to form rounded masses. According to Lyell, these extinct volcanoes began their eruptions so-called, in the Upper Eocene period, but were mostly active during the Miocene and Pliocene; the latest eruptions occurred at the close of the Newer Pliocene, if not in the Post-Pliocene period.

This region, displaying as it does so remarkably the grand succession of events in Central France since the last retreat of the sea, and illustrated by the masterly researches of Scrope, Lyell and

Murchison, is perhaps the finest field in the world for the study of extinct volcanic action. This large Relief Map is a copy of the one made by G. Poulette Scrope, F. R. S., and deposited in the Rooms of the British Geological Survey, London.

Size, 5 ft. 6 in. x 4 ft. 9 in. Price, \$75.

In glass case, \$100.

No. 2. Relief Map of Vesuvius. 1239

The Map shows a portion of the Bay of Naples, and the slope of the volcano on all sides from its crater to the plain. The steep, semi-circular escarpment of Monte Somma, and the modern cone of Vesuvius which it faces, rises in bold relief; and the various lava currents which have been ejected—from that which overwhelmed Herculaneum in 79, to the eruption of 1820—are represented with their dates.

Size, 2 ft. x 2 ft. 6 in. Price, \$10.

No. 3. Relief Map of Etna. 1240

This celebrated volcano—the loftiest in Europe—rises near the sea to the height of nearly 11,000 feet. The most striking and original feature in its physiognomy is the multitude of minor cones distributed over its flanks. They number about eighty, and throw out sulphurous vapors. The modern lavas overlie the ancient basaltic masses and sedimentary deposits of Mesozoic and Cenozoic time. Near the summit of Etna is the Val del Bove—a famous gorge of magnificent dimensions, a vast amphitheatre of four or five miles in diameter, surrounded by nearly vertical precipices from 1,000 to 3,000 feet high. This very accurate map was modeled after one constructed on the spot by Élie de Beaumont, the noted French geologist.

Size, 17 in. x 16 in.

Price, \$6.

No. 4. Relief Map of Teneriffe. 1241

This volcanic peak, 12,182 ft. high, stands (says Von Buch) like a tower encircled by its fosse and bastion—the bastion consisting of precipitous cliffs which, according to the theory of that geologist, were heaved up into their present position by a force exerted from below. We may consider Teneriffe (says Lyell) as having been from a remote period the principal and habitual vent of the volcanic Archipelago of the Canaries. This Map shows the whole Island,

the "*Canadas*" and their relation to the modern lavas, the crater of Chahorra and the snow clad Peak of Teyde.

Size, 2 ft. 3 in. x 2 ft. Price, \$10.

1242 No. 5. Relief Map of Palma.

Palma is a type of Von Buch's "crater of elevation." The map represents the entire island, showing the two mountain masses of which it consists, the deep cavity—"La Caldera"—in the centre, and the great ravine, or "barranco," leading to the sea.

Size, 2 ft. 4 in. x 1 ft. 8 in. Price, \$10.

1243 No. 6. Relief Map of Bourbon.

This volcanic island, called *Reunion* by the French, is covered with mountains which are separated by narrow valleys. The Piton de Neiges is an extinct volcano, while Piton de la Fournaise is known to have been active, like Popocatepetl, for periods of 60 or even 150 years. This map shows the relation of ancient trachyte and basalt to volcanic rocks and craters of modern date, and to the coral reefs which fringe the island. Size, 10 in. x 9 in. Price, \$4.

1244 No. 7. Relief Map of Mont Blanc.

This celebrated mountain is the culminating point of the Alps and of all Europe. This relief map, colored geologically, exhibits the mountain-monarch surrounded by its subordinate peaks, the various *cols* or passes, the magnificent glaciers—30 in number, with their lateral and terminal moraines, and the streams flowing from them. The higher granite points are seen flanked by metamorphic rocks, and on all sides are signs of an interesting development of plutonic action. Here, says Lyell, we find the most stupendous monuments of mechanical violence, by which strata, thousands of feet thick, have been bent, folded and overturned. Oolite and Cretaceous formations have been upheaved to the height of 12,000 feet; some Eocene strata to elevations of 10,000 feet; and even deposits of the Miocene rival in height the loftiest mountains of Great Britain. The Pliocene beds are undisturbed. An explanatory list of about 200 names accompanies the Map, serving as a guide to the topography and geology of this interesting region.

Size, 2 ft. 3 in. x 1 ft. 11 in. Price, \$15.

Most of the following Models in Relief are based on the topographical work of the U. S. Geological Survey and were originally prepared in the office of the Survey or in this establishment, from data furnished by that source. It is by the courtesy of Maj. J. W. Powell, the Director of the Survey, that we are enabled to offer copies to the public.

No. 8. **Relief Map of the Grand Cañon of the Colorado of the West, and the Cliffs of Southern Utah.** Modeled by E. E. Howell.

This model, colored to show the different geological formations, represents an area in Southern Utah and Northern Arizona 144 miles square. There is probably not another portion of our globe of equal extent that combines so much of wonder to the beholder, and of interest to the geologist. No other field exhibits erosion so graphically, and on so extensive a scale. The Colorado River is seen flowing through a gorge or cañon which it has cut for itself a mile in depth for a distance of 225 miles, some portions being 6,200 feet below the general surface. The long lines of cliffs—still greater monuments of erosion—show the succession of the geological formations one above another, from the Archæan granite at the bottom of the cañon to the Tertiary in the highest plateaus, which represent a thickness of 20,000 to 25,000 feet of strata. The Virgin and Beaver Dam Mountains which appear on the western border of the Map exhibit in striking manner the difference between mountains eroded from upturned and folded strata, and the plateau or table-topped mountains eroded from horizontal beds. A few volcanic cones and numerous craters of more recent origin afford another type for comparison.

This region is traversed by immense faults and folds, all of which are shown very clearly in the sections on the sides of the model, which extend downward to sea level.

To assist the mind in grasping the magnitude of the Grand Cañon, a small corner of the model is devoted to representations, on the same scale, of Yosemite Valley, and the gorge at Niagara Falls.

The structure of the region and the geological lessons taught are fully discussed in Powell's "Exploration of the Colorado River of the West." Size, 6 ft. x 6 ft. Price, ~~\$100.~~ ~~\$75-~~

No. 9. **Relief Map of the Henry Mountains of Utah.** Colored to show the Geological Formations.

By a happy accident one of the most distinguished names that American science has known was bestowed on a mountain group of transcendent interest to the geologist. The Henry Mountains are of volcanic origin, but the lavas were all injected among the strata and cooled in bubble-shaped bodies, called *laccolites*, which were afterwards exposed to view by erosion. There was no eruption, properly speaking, but irruption only, and the strata lying above the zone of irruption were bent up in arches or domes. The domes are numerous and in different ones every stage of the process of denudation is shown. This peculiar structure was discovered by Mr. G. K. Gilbert, who made a special study of the mountains in 1876 and has published a report on their geology (U. S. Survey of the Rocky Mountain Region). This Model was made by him and besides showing the laccolites gives careful expression to the peculiar type of land sculpture which characterizes the Colorado Plateau region. It exhibits also in a striking and beautiful manner a monoclinical flexure and its influence on the topography of the country. Size, 5 ft. x 3 ft. 7 in. Price, ~~\$50.~~ ~~\$40~~

No. 10. **Stereogram of the Henry Mountains.** Modeled by G. K. Gilbert.

This is a companion to the preceding and represents the same district of country as it would appear if all the eroded strata up to and including the Blue Gate Sandstone were restored to their original places. The region was displaced by the laccolites; and by the rains and rivers it was eroded. The Stereogram shows the result of the displacement separated from that of the erosion. No. 9 shows the net result of displacement and erosion together, or the actual condition.

This model is an instructive and valuable illustration of that scientific method which selects from a great body of facts those of a certain kind, and, by combining them by themselves, ascertains their laws. Size, 5 ft. x 3 ft. 7 in. Price, \$25.

No. 11. **Relief Map of the Henry Mountains and Vicinity.**
Colored to represent the Geological Formations. Modeled by G. K. Gilbert.

This map is one half as large as No. 9, and its scale is several times smaller. It represents an area five times as great, including, besides the Henry Mountains, the whole of the Waterpocket Flexure and the Kaiparowits and Aquarius Plateaus. It illustrates especially the subject of inconsequent drainage or the relation of drainage lines to uplift, and it shows how clearly the geological structure of an arid region is portrayed in the topography. In the northwest corner unconformity of the Tertiary upon the lower formations is shown. Size, 3 ft. 6 in. x 3 ft. Price, \$30.

No. 12. **Stereogram of the Henry Mountains and Vicinity.**
Modeled by G. K. Gilbert.

This is a companion to No. 11, and bears the same relation to it that No. 10 does to No. 9. The displacements exhibited include the Henry Mountain domes, the Waterpocket group of flexures, and several members of the great group of faults to which the peculiar topography of the High Plateau region of Utah is due.

Size, 3 ft. 6 in. x 3 ft. Price, \$12.

No. 13. **Relief Map of the High Plateaus of Utah.** Colored to represent the Geological Formations. Modeled by Capt. C. E. Dutton, U. S. A. Ordnance Corps.

This is another very carefully modeled map of a specially interesting region geologically. It lies directly north of the Grand

Cañon Map (No. 8), and includes enough of the northern portion of that map to show the whole of the high plateaus. A comprehensive report of the geology of this region may be found in Capt. Dutton's report (U. S. Survey of the Rocky Mountain Region) and in the reports of G. K. Gilbert and Edwin E. Howell (U. S. Exploration West of the 100th Meridian). The region represented is mainly one of high plateaus, separated by valleys of erosion and faults, and the great principles of structure and erosion, and the relation which they bear to each other are remarkably well illustrated. The value of the map, in this respect, is greatly enhanced by the introduction of a portion of one of the Basin Ranges of Mountains in the north-west corner. The contrast between the erosion of its upturned and contorted strata, and that of the comparatively horizontal beds of the plateaus, is very marked, and a study of the difference is very instructive.

Size, 4 ft. 8 in. x 4 ft. 10 in.

Price, ~~\$90.~~
* 50.

No. 14. Relief Map of the Mining District of Leadville, Colorado.

Geology by S. F. Emmons, Topography by A. D. Wilson, Modeled by E. E. Howell.

Few mining regions have attracted more attention than the peculiar, complicated and particularly rich ore deposits in the vicinity of Leadville. Few regions have received such careful study and masterly unravelment of the problems of dynamical geology and ore deposition as has this in the hands of the well known Government geologist, Mr. S. F. Emmons, and his corps of able assistants. For full details of this interesting place see Monograph XII of the U. S. Geological Survey.

This Map is an exact model of the country and represents an area of nearly 5 miles north and south by 6 miles east and west. It shows all mines, roads, streams, and on the eastern edge of the map, the city of Leadville. Like most of our other relief maps the position of the different kinds of rocks are shown by different shades of color. Horizontal and vertical scale the same.

Size, 2 ft. 8 in. x 3 ft. 2 in.

Price, ~~\$75.~~
* 60.

No. 15. The Leadville Map Dissected.

The surface area of this map is the same in every detail as that of the preceding. • But this is not all, as the map has been cut by sets of perpendicular section lines, running at nearly right angles to each other, and thus divided into many rectangular blocks. Geological sections are projected upon the sides of these blocks and show at a glance, much better than can be seen in any mine, the different rocks met with at different levels. Same scale as preceding.

Size, 3 ft. 6 in. x 2 ft. 11 in.

Price, ~~\$125.~~
\$700.

No. 16. Relief Map of the Yellowstone National Park.

To a person who has had the good fortune to see this great pleasure resort and wonderland of America, this model will be a source of enjoyment, as he can here review his route of travel, and note far better than in the extensive field the actual relation which one part bears to another. One unacquainted with the locality by a personal visit may gain much instruction from this model in regard to the topography as he will here find a faithful representation of the Yellowstone and East Gallatin Ranges, Electric Peak, Madison Plateau and the many other orographic features, as well as the positions of the far-famed Geyser Basins and Hot Springs, Yellowstone, Shoshone and Heart Lakes, the cañons of the Yellowstone and Madison Rivers, and the numerous other wonders of which he has heard or read.

Size, 4 ft. 4 in. x 5 ft. 2 in.

Price, ~~\$70.~~
\$60.

No. 17. Relief Map of the Yosemite Valley. Modeled by E. E. Howell.

Like the preceding region this pleasure resort is far-famed for its natural wonders. The map was constructed from data of the best surveys and is a faithful model of the prominent features. Among them may be mentioned the great granite plateau with its

lofty domes, the remarkable gorge which cleaves it asunder—its mighty walls rising almost vertically from the valley floor to the sublime summits of El Capitan, Half Dome and other points, 3,000 to 5,000 feet above, the sinuous windings of the Merced in the level valley bottom, and its famous tributaries which plunge over the terrible cliffs to join it.

Size, 4 ft. x 6 ft.

Price, ~~\$80.~~
\$75

No. 18. **Relief Map of the Yosemite Valley.**

This represents the same area as No. 17, but on a smaller scale.

Size, 2 ft. 5½ in. x 4 ft.

Price, ~~\$40.~~
\$35

No. 19. **Relief Map of the Eureka District, Nevada.** Geology by Arnold Hague, modeled by E. E. Howell.

High mountain groups, great variety of rocks and their complicated relations, rich mineral wealth, and the numerous and extensive illustrations of structural, stratigraphical, dynamical and physiographical geology make this area one of exceptional interest to the geologist. The rocks represented on the map by different colors are: *Quaternary*—Mountain Quaternary and Valley Quaternary. *Carboniferous*—Upper Coal Measures, Weber Conglomerate, Lower Coal Measures and Diamond Peak quartzite. *Devonian*—White Pine shale, and Nevada limestone. *Silurian*—Lone Mountain limestone, Eureka quartzite, and Pogonip limestone. *Cambrian*—Hamburg shale, Hamburg limestone, Secret Cañon shale, Prospect Mountain limestone and Prospect Mountain quartzite. *Igneous*—basalt, rhyolite, pumice (and tufa), dacite, augite-andesite, hornblende-andesite, quartz-porphry, granite-porphry and granite. The geology of the region is very fully described in detail by Mr. Hague in a Monograph of the U. S. Geological Survey.

The map is large and its scale—1 in. = 1,600 ft.—permits good topographical detail and clear geological expression.

Size, 5 ft. 2 in. x 5 ft. 6 in.

Price, ~~\$125.~~
\$100

- No. 20. **Relief Map of Mount Taylor, N. M.** Colored to show geological formations. Geology by Capt. C. E. Dutton, modeled by E. E. Howell.

The broad and comparatively simple geological features of this interesting region are clearly represented by this handsome model. Older eruptive rocks occupy the central portion and form the high table-land of Sierra Chivoto with its arms branching out into the completely surrounding Cretaceous strata, and culminating in Mount Taylor and lesser heights of the San Mateo Mountains near its south-western edge. Protruding through the Cretaceous plains, on the east of this great mass of older eruptions, are numerous small, sharp cones of basalt, and the same kind of rock forms long surface areas in the valley of the Rio San Jose in the south and south-western portion, where it flows over Jurassic rocks and out onto the Archæan. In the south-west corner, Jurassic, Triassic, Permian and Carboniferous strata underlie the basalt and dip under the Cretaceous. Archæan rocks are also exposed by the erosion of Cretaceous in the Rio Puerco Valley and in the connecting dry bed of Chico Arroyo. Scale, 1 in. = 1 mile.

Size, 4 ft. 2 in. x 4 ft. 2 in.

Price, ~~\$40.~~
35.

- No. 21. **Relief Map of the Uinta and Wahsatch Mountains.**
Modeled by Edwin E. Howell.

The Uinta Range of mountains, trending *east* and *west*, are represented in the center of this map; the Wahsatch Range, running north and south, occupy the western portion, and beyond them is the eastern edge of the Great Basin, with Utah Lake, Jordan River, a part of Great Salt Lake, Juba Valley and a few other features shown. North and south of the Uinta Range are desert basins, high plateaus with escarpment cliffs, and eroded cañons and valleys.

“In its geological structure the Wahsatch Range presents a type of extreme complication, contrasting with the simplicity and regularity of its nearest neighbor, the Uinta Range. There are

found represented here all the principal formations from the early Archæan to the latest Tertiaries, developed on a scale of unusual magnitude, while in its structure are seen the effects of dynamical forces, which have folded and twisted thousands of feet of solid rock as if they were as yielding as so many sheets of paper."—*S. F. Emmons*. "Wahsatch range is a marked topographical feature, and for geological interest is certainly second to no single mountain block in the world. The range itself is really a great mountain wall, the result of a profound break in the earth's crust; the western half of the range has been carried down beneath the level of the present plains leaving a lofty face presented to the west."—*Clarence King*.

"As a range, Uinta is unlike any other in America, being in fact a great, lofty plateau of nearly horizontal strata, which at the north and south edges are sharply broken and thrown into highly inclined positions."—*Id.* A significant fact in connection with these mountains is that Green River, in its sinuous, north and south course, cuts completely through them instead of following around the not distant eastern end. Two plausible, but widely varying explanations have been suggested for this.

Detailed discussions of the geology of the whole region may be found in Vols. I and II of the "Geological Explorations of the Fortieth Parallel."

Size, 4 ft. 2 in. x 3 ft. 11 in.

Price, ~~\$100.~~
\$ 80.

No. 22. Relief Map of the Washoe Mining Region, Nevada.

The prominent topographical and geological features, as well as minor details such as roads, railroads, towns, flumes and the line of the celebrated Sutro tunnel, will be found carefully represented in this model.

Size, 3 ft. 6 in. x 2 ft. 6 in.

Price, ~~\$100.~~
\$ 50.

No. 23. Relief Map of the United States. Modeled by Edwin E. Howell from data furnished by the U. S. Geological Survey, the Coast and Geodetic Survey, and the U. S. Hydrographic office. Scales:—horizontal, 1 in. = 50 miles; vertical, 1 in. = 5 miles.

This handsome map, modeled on the section of a globe 13.3 ft. in diameter, presents in a comprehensive and impressive manner the geographical position and form of this country, its orographical features and a complete delineation of its drainage system. The scales adopted permit of considerable detail with clearness in the representation of the great mountain chains as well as in those portions of lower relief. An interesting feature is the configuration of the bottom of the Gulf of Mexico and those portions of the Atlantic and Pacific ocean bottoms which occur within the limits of the map between the 67th and the 127th meridians.

Size, 6 ft. 3 in. x 3 ft. 4 in.

Price, \$90.

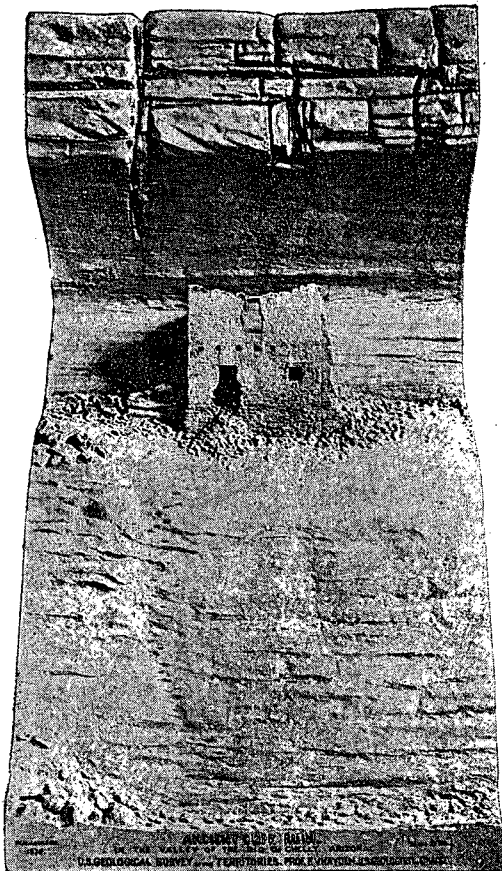
No. 24. **Relief Map of the United States.** Modeled from Government maps, by Burgi Brothers.

A larger map than the preceding, made of *papier maché* and finished by a new process. The vertical scale is ten times as great as the horizontal and presents in high relief the more prominent features. State lines, railroads, chief towns, mountains and the usual detail of modern maps are here represented. It is modeled on a curved surface, is well finished and presents a handsome appearance. Its great usefulness and low price will recommend it to teachers and school officers. Size, 7 ft. x 4 ft. Price, \$45.

*Revised for
new edition (2)*

ANCIENT CLIFF-HOUSES.

Who built these structures, when were they built, and whether their objects were to furnish places of permanent abode or merely impregnable fortresses to which the inhabitants of the plains below



could retreat before a more powerful enemy, are largely matters of conjecture. Through various of the western states and territories

architectural
 —notably Colorado, Utah, Arizona and New Mexico—are found ~~these~~ remains of an ancient people who, judging both by their architectural skill, and ~~that displayed~~ in their fictile manufactures, were far in advance of any Indians recently inhabiting these regions. Their ruins are classified as lowland or agricultural settlements, cave dwellings, and cliff-houses or fortresses. According to Mr. Holmes, those of the first class are chiefly located on the river bottoms, near water, and without reference to security or means of defense. Those of the second class are near agricultural lands, made in the face of low cliffs that were probably chosen with regard to security; “while the situation of the cliff-houses is chosen totally with reference to security and defense, built high up in the steep and inaccessible cliffs, and having the least possible degree of convenience to field or water.” * * * “The cliff-houses could only have been used as places of refuge and defense. During seasons of invasion and war, families were probably sent to them for security, while the warriors defended their property or went forth to battle; and one can readily imagine that, when the hour of total defeat came, they served as a last resort for a desperate and disheartened people.”

These dwellings or fortresses are perched high up on the faces of, oftentimes, nearly perpendicular cliffs, occupying natural caves or ledges formed by the weathering out of the softer strata. These sites were sometimes reached by means of natural pathways, sometimes by stepping-places cut into the almost vertical face of the rock; and again by means of ladders which could be withdrawn, thus rendering access to the habitations quite impossible.

The ground-plans of the structures were of two general types: ~~perfect~~ parallelograms and ~~perfect~~ circles. The latter form, round towers, ~~appears to have~~ had a religious significance with this people. Sometimes by itself, at others reduced to a mere interior room or “estufa” in the general assemblage, this round tower appears in nearly every group of structures. “The cliff-houses conform in shape to the floor of the niche or shelf on which they are built. They are of firm, neat masonry, and the manner in which they are attached or cemented to the cliff is simply marvelous. Their con-

struction has cost a great deal of labor, the rock and mortar of which they are built having been brought for hundreds of feet up the most precipitous places." The round towers are the more elaborate structures, having from one to three walls of hewn stone, dressed to the curve on the outside, and all neatly jointed and laid in mortar. The space between the outer walls is divided into rooms by heavy partitions, the central space—"estufa"—apparently being used as a council chamber or for the performance of the mystic rites of their religious superstitions. Wood appears to have entered into their works only as rafters, ~~and~~ occasionally to bridge across the top of a window or door opening, and for ladders. In most cases the stones used in the construction of these buildings are of fair size and were laid in mortar or adobe. The outer surface was made the smoother and was usually coated over with mud stucco,—not unlikely so as to render the buildings less conspicuous from a distance. ~~Sometimes~~ the interior was also finished, while ~~in~~ at others it was left bare. Many of these structures are so perfect and fresh that it seems difficult to appreciate that so great a time has elapsed since their abandonment that even tradition fails to record the date. However, they are so well protected from the rain by the overhanging roofs of the niches in which they ~~occur~~ ^{were built}, and the climate of these localities is so dry and constant, that time ~~does not leave its impress very readily.~~

One story predominates, but occasionally a second one was added. The size of these groups of buildings is largely regulated by the dimensions of the caves in which they were built. ~~One, The~~ Rio de Chelly ruin, had about 75 rooms on the ground plan alone, and extended over a space 545 feet long by 40 feet in greatest width.

These models were made in clay by Messrs. W. H. Jackson and W. H. Holmes, who carried on the surveys of these regions and whose work appears in the "Bulletin of the Geological and Geographical Survey of the Territories" (under Prof. F. V. Hayden), from which these notes are compiled and the quotations taken. The models are cast in plaster, painted after nature, and have the ladders, etc., represented that were found at some of the ruins. They are of sufficiently large size to present the matter clearly, yet

depressed

In some cases

but slowly

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not so large but that they can readily be accommodated in a museum hall or lecture room of ordinary size. When desired we will, at slight additional charge, make these to order in *papier mache*. They are, with the exception of No. 11, framed ~~in walnut~~. Nos. 1 to 6 are meant to be looked down upon, and should occupy flat table cases. The others may be placed upon the tops of wall-cases or hung upon the wall.

as shown in cuts

1. Pueblo de Taos, New Mexico.

W. H. JACKSON, Sculptor. Scale: 1 in. = 20 ft.

Size: 3 ft. 8 in. long x 3 ft. 4 in. wide x 7 in. high. Price, \$60.

This is a walled city on a level plain with a river running through it. The houses are of one to four stories in height with the entrances through the roofs, which were reached by ladders that are in position. In close proximity to some of the houses are platforms of considerable size formed of poles laid upon a framework.

2. Pueblo of Acoma, New Mexico.

W. H. JACKSON, Sculptor. Scale: 1 in. = 50 ft.

Size: 3 ft. 6 in. long x 3 ft. wide x 9 in. high. Price, \$65.

This town is built upon a plateau. The houses are, at various points upon the outskirts, carried to considerable heights and not improbably served as watch-towers from which the approach of an enemy could be discerned from a distance.

3. Pueblo of Tegua, Arizona.

W. H. JACKSON, Sculptor. Scale: 1 in. = 12½ ft.

Size: 4 ft. long x 2 ft. 6 in. wide x 1 ft. 3 in. high. Price, \$45.

This is one of the seven Moqui villages and is built upon a mesa bordered by precipitous cliffs. The Moquis are a semi-civilized people now inhabiting part of Arizona, in some respects less

advanced than were the cliff-dwellers. The possible relations between this people and those who built the cliff-dwellings is an interesting question.

4. Restoration of Pueblo Bonito, Chaco Cañon, New Mexico.

W. H. JACKSON, Sculptor.

Scale: 1 in. = 20 ft.

Size: 2 ft. 7 in. long x 1 ft. 9 in. wide x 6 in. high.

Price, \$50.

This name has been well chosen, for this certainly is a pretty town, with its houses of one to four stories, with the ladders leaning against them, and in places going down through the roofs into the interiors.

5. Ruin of Ancient Tower, South-western Colorado.

W. H. HOLMES, Sculptor.

Scale: 1 in. = 2 ft.

Size: 2 ft. 9 in. square x 8 in. high.

Price, \$25.

This tower was built of three concentric circles of roughly-hewn stone. A space of five feet was left between the two inner walls, and this was divided into fourteen rooms, at least 12 feet in height. Apparently there were no openings through the circular walls. This tower stands upon the border of a group of connected buildings or apartments, (about 100 in all), which has a smaller round tower on its opposite side, all occupying a low mesa. Mr. Holmes says: "The site of this village can hardly have been chosen on account of its defensive advantages, nor on account of the fertility of the surrounding country. The neighboring plains and mesas are as naked and barren as possible. The nearest water is a mile away, and during the drier part of the season the nearest running water is in the Rio Dolores, nearly fifteen miles away. To suppose an agricultural people existing in such a locality, with the present climate, is manifestly absurd. Yet every isolated rock and bit of mesa, within a circle of miles, is strewn with remnants of human dwellings."

6. **Montezuma's Well, near Camp Verde, Arizona.**

W. J. HOFFMAN, Sculptor.

Size: 3 ft. 8 in. long x 3 ft. 3 in. wide x 9 in. high. Price, \$40.

This is a small lake bordered by perpendicular cliffs, in small caves in the faces of which are located several cliff houses. The "well" is 300 feet in greatest diameter, and 75 feet in depth. It is quite unique in style and is a very handsome model.

7. **Ruins of an Ancient Cave Town, Rio de Chelly, Arizona.**

W. H. JACKSON, Sculptor. Scale: 1 in. = 6 ft.

Size: 3 ft. 9 in. long x 3 ft. high x 14 in. thick. Price, \$40.

Of this ruin Mr. Jackson says: "This cave-town occurs in a great bend of the encircling line of bluffs, where the wash makes a wide detour, perched upon a recessed bench about 70 feet above the valley, and overhung by a solid wall of massive sandstone extending up over 200 feet farther." * * * "The total length over the solidly-built portion of the town is 545 feet, with a greater width in no place of more than 40 feet. There are somewhere in the neighborhood of 75 rooms upon the ground plan. * * * Midway in the town is a circular room of heavily and solidly built masonry; that was probably intended for an *estufa* or council-hall; that is, if we can reasonably assume any similarity in the methods of building or worship to those of the Pueblos of New Mexico." The whole front of this portion of the town is without an aperture save very small windows, and is perfectly inaccessible, both from the solidity of the wall and the precipitous nature of the foundation-rock beneath it. Admittance was probably gained from near the circular building in the center, by ladders or any other well-guarded approach over the rocks.

8. **Restoration of No. 7. By MR. JACKSON.**

Size and scale the same.

Price, \$50.

In this model Mr. Jackson has restored the walls of the buildings to what he considers was their former condition.

9. Cliff Ruin in Mancos Cañon, Colorado.

W. H. HOLMES, Sculptor.

Scale: 1 in. = 2 ft.

Size: 3 ft. 9 in. high x 2 ft. 3 in. wide x 1 ft. thick. Price, \$30.

Of it Mr. Holmes says: "It is also in the cliffs of the north side, about 700 feet above the river, and although not so large or complicated in design as the houses just described, it shows higher skill in construction and is in a better state of preservation. It is also exceedingly difficult of access." * * * "There are four small apartments only; the front one being 10 feet long by 6 wide. Of the back rooms, one is 9 by 10 and the other 6 by 6 feet, while the apartment with the curved wall is much smaller. The walls are about twelve feet high and reach within from two to three feet of the overhanging roof. They are built in the ordinary manner of stone and adobe mortar, and, what is rather remarkable, were plastered both inside and out. This plaster does not differ greatly from the common mortar, is lightly spread over the walls, probably with the hands, and in color imitates very closely the hues of the surrounding cliffs, a pleasing variety of red and yellow grays. Whether this was intended to add to the beauty of the dwelling or to add to its security by increasing its resemblance to the surrounding cliffs, I shall not attempt to determine. Another remarkable feature of this house is the consummate skill with which the foundations are laid upon and cemented to the sloping and overhanging faces of the ledge."

10. Ancient Cliff Fortress, Beaver Creek, Arizona.

W. J. HOFFMAN, Sculptor.

Scale: 1 in. = 5 ft.

Size: 3 ft. 4 in. high x 2 ft. 1 in. wide x 10 in. thick. Price, \$30.

This is an elliptical hole in a nearly perfectly perpendicular cliff, with a house built in it. Access was probably gained by nicks cut into the cliff and serving as a ladder, but now leaving no trace; or the 40 feet of height above the level may have been scaled by ladders.

11. Ancient Cliff Ruin, in the Valley of the Rio de Chelly,
Arizona.

W. H. JACKSON, Sculptor.

Scale: 1 in. = 3 ft.

Size: 3 ft. 7 in. high x 3 ft. wide x 1 ft. 10 in. thick. Price, \$30.

This cliff-house is the subject of our illustration, which is an Ives's process cut from a photograph of the model itself. Mr. Jackson says: "It was reached from the valley by a series of steps cut into the rock, but now so weathered away as to be impracticable." * * * "The house consists of two stories 20 feet in height, built against the sloping back wall of the bluff; the lower story is 18 by 10 feet square, divided into two rooms, one slightly smaller than the other, with a communicating door between, and a large door opening outward from the larger one. The upper floor appears to be all in one room, with one large window facing outward and much smaller ones in the side walls. Extensions existed upon either side, and also some kind of structure in front, probably a sort of platform-house covering the lower doorway. To the right the ledge grows narrower and gradually merges into the perpendicular bluff; 40 feet from the house, on this ledge, are the remains of a wall across it. About 20 rods above, at the foot of the bluff, there is a deep, natural reservoir of water formed by the accumulated rains upon the plateau above pouring over the rocks and scooping out a basin 30 feet in diameter and fully as deep, that seems to retain a perpetual supply of water."

CASTS OF CELEBRATED ANCIENT INSCRIPTIONS, MONUMENTS, ETC.

—♦—

“O Egypt, Egypt! a time shall come when, in lieu of a pure religion and a pure belief, thou wilt possess nought but ridiculous fables incredible to posterity; and nothing will remain to them but *words engraven in stones*, the only monuments that will attest thy piety.”—*Books of Hermes.*



1237. Rosetta Stone.

Size: 3 ft. 3 in. high x 2 ft. 6 in. wide.

Price, \$16.

The original of this celebrated inscription, which is now in the Gallery of Egyptian Antiquities in the British Museum, was dis-

covered in 1799 in the little town of Rosetta (Rasheed of the Arabs), in the delta of the Nile.

It is a thick, irregular-shaped slab of hard, black basalt, on the surface of which is an inscription in three languages—Egyptian hieroglyphics, Demotic, and Greek. A translation of the Greek shows that it was an act of the priests assembled in synod at Memphis, B.C. 196–197, in honor of the king Ptolemy Epiphanes, in the ninth year of his reign; and, after reciting the events of the period, the ancestry of the king, the troubles in higher Egypt, the decease of Ptolemy Philopates, the attack of Antiochus, the suppression of rebellion, the remission of taxation, and the gifts to Apis and Mnevis and the sacred animals, proceeds to order that a figure of the king should be placed in the temples; that a shrine should be placed with the other shrines and be carried in procession on a special festival in honor of the king on the 30th Mesori, his birthday; and above all, that a copy of this synodical act should be engraved on a tablet of hard stone in sacred characters (hieroglyphics), in writing of the country and in Greek letters, and set up in every temple of the first, second and third rank throughout the country.

The greatest interest centering in this tablet is that it gave the first clue to the hieroglyphics. The three texts of this inscription telling the same story, together with the obelisk of Philæ, rendered the translation of the heretofore unreadable hieroglyphics comparatively simple. A translation accompanies this.

2. Isis.

Size: 3 ft. x 1 ft. 7 in.

Price, \$15.

The Egyptian Isis is here represented in bas relief as seated on a throne bearing on her head the emblematic solar disc and cow's horns. In her right hand she holds a wand. Two columns of hieroglyphics occupy the upper left corner of the tablet.

Isis is sometimes styled the Egyptian Venus because, in some of the forms of Egyptian mythology, she is given attributes similar to Venus among the Romans.

She was "the sister and wife of Osiris," "the goddess-mother," "the mistress of heaven," "nurse of Horus," "the mourner of her brother," "the eye of the sun," "the regent of the gods."

Her tears, caused by the murder of Osiris by Typhon, were supposed to cause the overflow of the Nile.

She invented the cultivation of wheat and barley, was the goddess of the earth and, with Osiris, was the only divinity worshipped by *all* the Egyptians.

3. Temple Stone.

Size: 3 ft. x 2 ft.

Price, \$16.

This stone is the only well-authenticated relic of the great temple at Jerusalem.

Within the porticos of the temple, "at a short distance from and running parallel with them, was an 'elegantly wrought' stone balustrade four and a half feet high, which marked the limit beyond which no alien could go under pain of death. The purpose of this balustrade was plainly made known by inscriptions, some in Greek and others in Latin, on large stones resting on the top of the balustrade, which were set at equal distances from each other all the way round."

On the 26th of May, 1871, M. Clermont Ganneau, the well-known oriental archæologist, discovered this stone in the corner of a wall in the ruined premises of a Mohammedan school. It is of hard, stratified marble. The inscription is in seven lines and translated reads as follows: "Let no alien pass beyond the balustrade and inclosure around the holy place. He who is caught will be the cause of his ensuing death."

"The similarity of this Greek with that of Josephus in describing these inscriptions, the correspondence in size of the stone with the measurements of Josephus, the legal precision of its terms, the excellence of the sculpture, leave no doubt that this inscribed stone

was one of those set up by Herod in the temple a few years before the birth of Jesus."*

The original of this inscription is in the Royal Museum of Constantinople.

4. The Siloam Inscription.

Size: 2 ft. 4 in. x 1 ft. 2 in.

Price, \$3.50.

This inscription was found in the summer of 1880 by a native boy who accidentally fell into the water in the channel near the pool of Siloam and, on rising to the surface, discovered the inscription. It occupies the lower face of an artificial tablet in the southern wall of the tunnel which communicates with the spring of the Virgin, the only natural spring near Jerusalem, and is about 19 feet from where the conduit debouches into the pool of Siloam.

Although bearing no date, the forms of the letters used show it to be not much later than the Moabite Stone. There are some good reasons for thinking that it dates back to the time of Solomon, but the prevalent opinion of scholars is that the tunnel and, consequently, the inscription in it were executed in the reign of Hezekiah. (See II Chron. xxxii, 30; and II Kings xx, 20.) The translation is as follows:

“(Behold) the excavation! Now this is the history of the excavation. While the excavators were still lifting up the pick, each towards his neighbor, and while there were yet three cubits to (excavate, there was heard) the voice of one man calling to his neighbor, for there was an excess in the rock on the right hand (and on the left). And after that, on the day of excavating, the excavators had struck pick against pick, one against the other, the waters flowed from the spring to the pool for a distance of 1,200 cubits. And (part) of a cubit was the height of the rock over the heads of the excavators.”

* These notes are taken from an article in “The Independent” of December 5, 1889, by Prof. Howard Osgood, D.D.

5. The Moabite Stone.

Size, with restored base: 4 ft. 2 in. high x 2 ft. 4 in. wide x
1 ft. 2 in. thick. Price, \$30.

This is of black basalt rounded at the top, two feet broad and nearly four feet high. Across it runs an inscription of thirty-four lines in Phœnician characters. It was discovered by Rev. F. Klein at Dibhân, while traveling in the land of Moab, August, 1868. While negotiations for its purchase by the Berlin Museum were pending, M. Clermont-Ganneau indiscreetly took squeezes from it and offered a much larger sum for the stone, which so aroused the cupidity of the Arabs and pashas that the governor of Nablûs demanded the stone for himself. "The Moabites, thus exasperated, sooner than give it up, put a fire under it and threw cold water on it, and so broke it, and then distributed the bits among the different families to place in the granaries and act as a blessing on the corn; for they say that without the stone (or its equivalent in hard cash) a blight will fall upon their crops." Most of the pieces have been recovered and, by means of the squeezes, placed in their proper positions. The stone is now in the Louvre in Paris.

The inscription is a record by Mesha, King of Moab, of whom we are told in II Kings, iii. Mesha describes the successful issue of his revolt against Israel and the revenge he took upon the Israelites for their former oppressions of his country. The inscription reads like a chapter from the Old Testament and is full of interest to Biblical students.

The story is told in two different ways in the two plans. In the Biblical account the Israelites have presented the matter so that it does not appear like a serious defeat that they suffered. On the Moabite stone, however, Mesha dwells on the fact of how he defeated the Israelites in many cities, enslaving them, etc. It is the same story told in one place by the defeated, in the other by the victors.

In Kings we have the people of Israel, Judah and Edom despoiling the land of Moab until they came to Kir-haraseth, * * *

"only in Kir-haraseth left they the stones thereof, howbeit the slingers went about *it* and smote it.

"And when the king of Moab saw that the battle was too sore for him, he took with him seven hundred men that drew swords, to break through *even* unto the king of Edom: but they could not.

"Then he took his eldest son that should have reigned in his stead, and offered him *for* a burnt offering upon the wall. And there was great indignation against Israel: and they departed from him, and returned to *their own* land."

Mesha, on the contrary, tells how he conquered various cities fortified by the king of Israel, and how he carried on such works as building irrigating ditches, etc., by the labor of the captive Israelites. Ancient stories appear to have two sides as well as do modern ones.

6. The Chaldean Deluge Tablet.

Two baked-clay leaves, with cuneiform characters, each
6 in. long x 5 in. wide. Price, \$4.

Traditions of a universal deluge are found in all parts of the world, but the Chaldean account, discovered by Mr. George Smith in the library of the monarch Asshur-bani-pal in his palace in Nineveh, is the only one, outside of the Old Testament, in which the cause assigned for it is a moral one. "Here, as in Genesis, Sisuthros, the Acadian Noah, is saved from destruction on account of his piety; the rest of mankind being drowned as a punishment for their sins."

The story of the deluge formed the subject of several poems among the Acadians, fragments of which have been found among the ruins of Nineveh and also in Babylonia. Two of these poems were amalgamated in a great epic which described the adventures of a solar hero (Gisithubar). The epic was arranged in twelve books to correspond with the signs of the zodiac, the eleventh book answering to Aquarius and very appropriately contains an account of the flood. Sisuthros, who was not only saved from the flood

like Noah but was translated like Enoch, tells the story to Gisdhubar, whom he meets in the other world. This was made about 660 B.C., and is a copy of an older text dating back not less than to the 17th century B.C. The original is now in the British Museum.

7. The Black Obelisk of Shalmaneser II, of Assyria, 859-825 B. C. Date of Obelisk 828-825 B. C.

Size: 6 ft. 8 in. high x 2 ft. 2 in. wide x 1 ft. 6 in. thick. Price, \$45.

This obelisk of black marble was found by Mr. Layard in the center of the mound at Nimroud, and is now in the British Museum. Upon it are recorded the annals and conquests of Shalmaneser who died 823 B.C. after a reign of 35 years. A translation of the inscription was one of the first achievements of Assyrian decipherment, and was made by Sir H. Rawlinson. Each of the four sides of the obelisk, which is not quite square, is divided into five compartments of sculpture, representing the tribute brought to the Assyrian king by vassal princes, Jehu of Israel being among the number. The translation is too lengthy to be given in this connection. The obelisk is a very striking object.

8. Winged Bull and Winged Lion.

These are about 11 ft. high x 11 ft. long. Price, \$175 each.

They were discovered in Nineveh by Mr. Austen H. Layard in 1846, and are described in his well-known work entitled "Nineveh and its Remains," so a lengthy description is uncalled for in this place.

These are the strange creatures of the Cherubim which guarded the entrances to the palace of the Assyrian monarchs. In the inscriptions they are called Sedu, "spirits," and are said "to protect the going and coming of the king," and to "exclude all evil." The Winged Bulls "Nin" are called "The Bulls of Heaven," and were supposed to have been made by Anu, the God of Heaven. The

Winged Lion "Nergal" was sacred to Ariat or Anatis, and also to Beltis the Goddess of War. These belong to the period of Assurnazir-pal who commenced his reign about 885 B.C. They are each represented with five legs (three fore legs) so as to appear perfect whether seen from the side or from directly in front, the front being in full sculpture, the side in relief. The originals of these casts are of yellow limestone and are now in the British Museum.

9. Reduced Copies of the above.

Size: 11 x 11 inches. Price, pair, \$8; single, \$5.

These are reduced models made from the above-mentioned figures, of suitable size for bookcase or shelf ornaments.

10. Assyrian Winged Figure.

Size: 3 ft. 8 in. high x 2 ft. 9 in. wide. Price, \$15.

These are two bas reliefs of winged human figures found at Nineveh. Mr. Layard says: "Behind the lions was another chamber. I uncovered about fifty feet of its northern wall. On each slab was carved the winged figure with the horned cup, fir cone, and square vessel or basket. They were in pairs facing one another, and divided by an emblematic tree." These winged figures were found in great numbers, some of which were fourteen to sixteen feet in height. Often they appear to be attendant on the sculptures of kings. Several lines of cuneiform writing cross the top of this slab.

11. Assyrian Winged Figure.

Size: 3 ft. 6 in. high x 2 ft. 9 in. wide. Price, \$15.

This other figure bears a branch of five flowers in the left hand, the other hand being raised as in a salute. Across the bottom are several lines of cuneiform writing.

The two evidently formed part of a series such as Mr. Layard describes.

12. Aztec Calendar. *See Records of Past, Jan., '03*

A reduced model of this stone $8\frac{3}{4}$ in. in diam. Price, \$1.50.

This calendar is said to have been carved in ~~1519~~¹⁴⁷⁹ A.D. and brought to Tenochtitlan (City of Mexico). After the temple in which it reposed was destroyed, the Christian priests caused the calendar to be thrown into the surrounding marsh, where it lay buried for two centuries. On the 17th of December, 1790, upon lowering the grade near the central square of the City of Mexico, this was again discovered and now occupies a place in the Museo Nacional.

It is a huge disc of basalt ~~12 feet~~^{11' 8"} in diameter. From it we find that they formed the sixteen hours of their day with precision (the stone being also a sun dial), the periods of the solstices and the equinoxes. The years were of the correct number of days, and the proper correction was made for the bissextile. Every 52 years completed a cycle. It certainly denoted considerable astronomical knowledge in this people.

13. Animal Mounds of Wisconsin.

Modeled by J. A. LAPHAM.

Price, \$50.

Many of the Mound Builders made their earth works in the forms of animals. Fourteen of the more notable ones of Wisconsin have been brought together on one plaque by Mr. Lapham. This is six feet long by three feet and a half wide, and may hang on the wall or be laid flat to suit convenience. The mounds are all modeled after measurements obtained by actual surveys, the data of which appears upon the label accompanying the model. The animals represented are: (1) The Man; (2) The Trunk and Arms; (3) The Buffalo; (4) The Long-Armed Man; (5) The Otter; (6) The Bear; (7) The Horse; (8) The Mink; (9) The Bird; (10) The Eagle; (11) The Elephant; (12) The Broad-tailed Animal; (13) The Squirrel; (14) The Turtle.

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