MODELING ANIMALS IN CLAY. THE PASSING OF TAXIDERMY.

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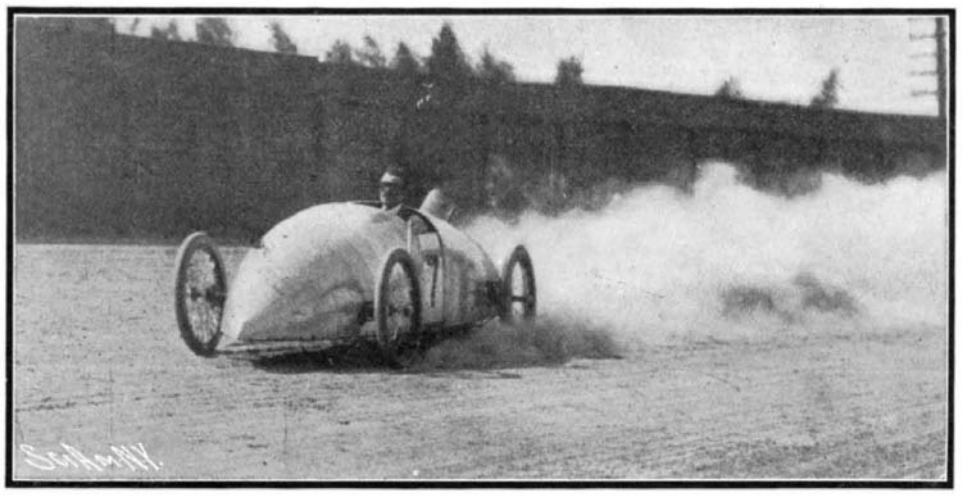
The size of the group will be 22 feet by 11 feet. Mr. Clark has shown by his work that he is a painstaking and artistic craftsman in clay, and in a thoroughly realistic way depicts the leading traits and appearance of the animal in hand. The result is that the finished model is full of vigor and has a life-like aspect, which is a striking advance over the stiff, soulless examples hitherto turned out by the old manner. In a recent interview, Mr. Clark outlined to the writer his working plans, and just how he managed to evolve from the remnants of the fallen creature his excellent reproductions.

Some of the striking illustrations in the various stages of this interesting process, with the artist at work upon his creations, are here shown for the first time. The mounting of large animals has become an art, and the modern and advanced taxidermist is today an animal sculptor. The passing of taxidermy, with its primitive stuffing, is a foregone conclusion. The animal is so skillfully imitated in clay in shape, contour of the body, muscular development, tapering of the limbs, that it seems to the casual observer for a moment that he has been spirited away to the forest and surrounded by the creatures themselves. The immediate superiority of producing animals in clay lies in the fact that the minutest detail in proportion, characteristic position most commonly assumed, all the gradations in anatomy, can be worked up and brought almost to the desired state, and, after the skin is temporarily tried on, the figure can be immediately altered at such points as improvements are necessary before the skin is permanently stitched in place. This was not possible under the old ways; for, after having reached what was considered a perfect shape, the skin was sewed on the hard plaster covering the limbs, which, being set and rigid, would not allow any change in the position or attitude of the animal. Wrong measurements or faulty construction in the finished model demanded laborious chiseling away of the plaster; while anything like giving a new and different pose meant total annihilation of the whole framework. These difficulties have been done away with in clay modeling. The old-time taxidermist, so to speak, might be fittingly designated as a mere mechanic, who, with tools, patterns, and prescribed regulations, produced a mounted specimen. Artistic and creative talent was drawn upon but slightly. In clay work the head and each limb can be repeatedly moved during the process of construction, with ease, yielding and bending to the touch and skill of the artist. Mr. Clark has brought into his work much close and original nature investigation, supplemented by pictorial studies obtained by the camera at the Zoological Park and elsewhere. Often, when out in parks or zoos, animals will, under varying conditions, assume a particularly striking pose. This is caught by the photograph, and afterward used in groups to good effect. With the old method the bones were used in the mount, and having heavy iron rods adjusted to the leg bones as supports, they were fastened to a center-board cut to the general outline of the animal, which might be called the backbone of the mount. Upon this center-board and legs were bound excelsior, as well as on the two iron rods that supported the skull. The excelsior was worked up to nearly the final shape, and when still very soft, common clay was smeared over about one-half an inch thick, which caused the skin to adhere to the substance. Only a little modeling from the outside could be accomplished. Everything had to be permanently fastened. There was much guesswork in construction, so much indeed that it could not be told how the animal would look until finished, and then it was impossible to change. In the modern method, while the clay modeling is progressing, the skin may be frequently tried on, and the sculptor may see how the animal will look when completed. Many sportsmen have mounted heads which they find are cracking and splitting. This is due to the clay used underneath the skin, which, after becoming dry, will shrink and crack, and since the skin is attached to the clay, it will necessarily have to give away, producing an ugly tear. Many a fine skin has been ruined in this way. In the new method there is no danger of anything like this occurring. The skin, after it is once on, is good for an indefinite length of time. After the animal is shot in the field or has died in the zoo, measurements are taken, such as total length, height, and circumference of the body. These are required to insure accurate calculations in the construction of the final mount.

With the skin, these figures, and the bones of the skull, legs, shoulder blades, and pelvis, which are saved from the animal, the modeler is ready to begin. First of all, the skin is treated with an application of salt immediately after it is taken from the animal. This acts as a preservative, and has a tendency to keep it for an unlimited period. It is further thinned down by a special knife and put into a soft and pliable state, so that in course of the preparatory stage it may be tried on frequently, to see if the figure with the skin on will compare well with nature. A miniature model in clay is the foundation for the intended creation. In this the characteristic attitude and general arrangement of the animals are worked out in detail as they will appear in a permanent large group. At various stages this is consulted, and compared with the work in progress. Clay is used for modeling the large figures, as this material has the advantage of being worked freely and quickly. A frame is made sufficiently strong to support the heavy clay, and to this is attached the bones and skull, put in position by the measurements taken. Then the clay is applied, and, with the bones as a fundamental guide, the anatomy and form are gradually worked out, at the same time always referring to the small model and many photographs from the live animal. The figure is modeled, of course, as the animal will be without the skin. This takes its respective place finally. After the clay model is completed, a plaster mold is made, from which durable and light casts are taken. These being assembled reproduce exactly the original clay model, iron rods being used as supports for the legs. After the cast has been obtained, the clay and bones are entirely discarded. The cast is allowed to dry, and is thereafter given two or three coats of shellac to make it waterproof. The skin, by this time, has had its final touches by the tanner, and is ready to be put on. Since it is moist, a paste of flour and glue is used. The seams having been sewn up, the skin is adjusted; such parts as the hoofs and ears being worked up at the very last with *papier maché*. The delicate modeling to be found around the eyes and mouth may be more satisfactorily represented by modeling from the outer surfaces of the skin, with the soft *papier maché* underneath. With a little color on the eyelids, etc., to give the natural tints, the animal is completed. Unlike the work of the animal painter on canvas, distance does not lend enchantment to the view. More than double the time is expended upon the preparation of a figure in clay than by the old method, but the finished results are correspondingly superior, being both a delight and pleasure to the eye of the general onlooker and the trained naturalist. Additional realism will be incorporated by installing some of the natural surroundings in the feeding grounds frequented by the animals when alive, such as willow twigs, moss, leaves, branches, etc. These have been especially secured by Dr. B. E. Dahlgren, head of the department, during a recent trip to this locality. Thus a veritable bit of transplanted forest from British Columbia and the Olympia Mountains will form the scenic feature of the group.



LOUIS ROSS MAKING A MILE A MINUTE ON HIS 20-HORSE-POWER STANLEY STEAMER.

Traction Engine for Tule Lands.

At the junction of the Sacramento River with the San Joaquin there are millions of acres of lands which are submerged in times of flood, but at ordinary stages the rivers are covered with rank and luxuriant vegetation. They are known as "tule" lands and are formed of a soil of exceeding richness and strength. Large amounts of capital and much engineering ability have been expended in surrounding certain portions of these lands with levees, high and broad, in order to reclaim them permanently from the inroads of the flood. When properly cultivated they produce enormous crops of grains, vegetables and fruit. Crops of 80 sacks of wheat have been gathered from a single acre. Mechanical aids to cultivate the extensive tracts are absolutely necessary, and the most powerful machinery is employed for that purpose. A new pattern of traction engine has been turned out by the Best Manufacturing Company, of San Leandro, Cal., designed for working on reclaimed land situated near Stockton. The soil is so deep and loose that it is impossible for a horse to travel across it, consequently only a traction engine could be employed and with wheels broad enough to support the heavy weight required. The soil is of about the consistency of heavily-packed snow.

This particular traction engine is of 110 horse-power. Its total weight is 18 tons, and each driving wheel is 8 feet in diameter, with a breadth of face of 5 feet. The leading wheel is 5 feet high with 45-inch face. Double engines, duplicates, afford the necessary power. The boilers are upright, combination type, and oil is the fuel used. The cab is tightly inclosed and provided with a blower to eject the clouds of dust which arise as the engine moves over the light soil. Without the blower the cab would not be habitable. The engine has a width of 16½ feet and a total length of 24 feet. Its speed is from 2½ to 3 miles an hour, and its general running capacity is from 80 to 100 acres a day. The first work to be done is in rolling over the "tules" and crushing the vegetation preparatory to clearing the lands. Afterward the engine will be employed in plowing, cultivating and harvesting. Generally speaking, the tule lands are level; but there are always considerable depressions in the surface beside gullies and exhausted sloughs. Over these uneven surfaces, the new type engine travels very satisfactorily, and it promises to prove a successful application of mechanical power to difficult agricultural conditions.

THE BOSTON AUTOMOBILE RACE.

Thousands of spectators witnessed the automobile races on the Readville track, in Boston, two weeks ago. The events were almost all of them exciting; and still, there were no accidents to the participants. The first of the series of races for the Boston Herald cup was won by H. L. Bowden in his Mercedes. Although he did not succeed in winning a prize, Louis Ross broke the 5-mile steam machine record with a Stanley by doing the distance in 5 minutes 33 3-5 seconds. His was, indeed, the most sensational performance of the day. His machine was of 20 horsepower, and was driven by two engines. The steam pressure of 1,000 pounds was so high that, in the endeavor to use it to the utmost advantage, serious leakages occurred, which prevented him from finishing in the 10-mile race. In a later race he broke his axle, and was thus again prevented from finishing. How terrific must have been the speed at which he was going is well shown in our illustration.

The Königliche Mechanisch-Technische Versuchsanstalt at Charlottenburg (in spite of its long name) is well worthy of a thorough inspection by Americans interested in this class of technical work and progress. This laboratory was founded in 1880, and its first work was to settle some disputed points on the quality of Portland cement. In 1882 its duties were extended to the testing of metals and other materials of construction. At the present time the Versuchsanstalt undertakes researches of general scientific interest, as well as making reports on the quality of goods submitted to it by any of the public departments or by private firms. In 1886 voluntary workers were for the first time admitted to the establishment. Such volunteers are young men who, having already a good knowledge of scientific work, wish to have the advantage of assisting in one or other of the important researches always in progress at the laboratories. They receive no pay for their services, and undertake to assist in the laboratories for a period of at least three months, and to work entirely under the direction of the permanent staff of the Versuchsanstalt. Students from the higher technical schools are also admitted to work in the laboratories at Charlottenburg, so that these serve for the instruction of students as well as for research.

An institution on these broad lines might well be copied by some of the great teaching schools of the United States.

The report by the hydrographer of the Admiralty of the work performed during the year 1903 in the examination and charting of seas and coasts in various parts of the globe has been issued as a Parliamentary paper. It appears that eleven vessels were regularly engaged in the operations, and that during the year 344 rocks and shoals which were dangerous to navigation were reported. Of these, 40 were reported by surveying vessels, 21 by other of his Majesty's ships, 12 by various British and foreign vessels, 13 were discovered by vessels striking on them, and 245 were reported by colonial and foreign governments.