

SOME AMERICAN MUMMIES.

BY PROF. C. F. HOLDER.

The history of embalming in Egypt is well known, and it is a more or less interesting study to attempt to compare the making of mummies in the East and in America with a view to throwing light on the singularities and religious observances which formed a part of the ceremony of mummification. From a translation of sepulchral texts in Egypt it has been learned that mummies were made there to keep the body inviolate and ready for the return of the soul at the time of resurrection. The Egyptians seemed to recognize four parts in man—the body, the soul, an intelligence, and an "appearance," "eidolon." At death these were separated, and then intervened a period of from three thousand to ten thousand years.

During this time the soul traveled the under world as a penance, while the intelligence wandered through space. As these parts were to return at the end of the time indicated, it was considered necessary to preserve the body from corruption, and in the attempts to accomplish this we find the reason for embalming among the ancient Egyptians, their pyramids, their secret burials, and the extraordinary methods of hiding the dead, customs which have been of the greatest value to archaeologists and students of man and the human race. The embalming process was carried on with greater or less ceremony and expense in proportion to the wealth of the deceased; and, if the latter were a king or a member of the royal family, or a wealthy man, no expense was spared to embalm him in a lasting manner, and to place the remains in a well-built tomb.

The embalming was carried out on a regular system, there being four rituals to govern it. The first related to the incisions to be made in the body. The second was a manual treating of the gums, resins and spices to be used, the bandages and elaborate descriptions as to the method of binding the body and the prayers to be recited at each stage of the work. Third, the water ritual giving the litanies to be recited while the body was being taken by water to its last resting place; and fourth, a work containing the funeral ritual given when the body was placed in the tomb. These books were for the instruction of the priests and operators. The process of embalming was divided. First came the evisceration, taking about two weeks. This was followed by the salting or bituminizing, which took thirty days; then came the spicing and bandaging, occupying thirty-five days, or seventy-two days in all.

The great cemeteries of these days all had establishments for making mummies attached to them, as crematories are found to-day; and the professional embalmers constituted an army of people in themselves. According to Edwards, there were never less than eight hundred bodies in process of mummification in the workshops of the necropolis of Memphis. The method of treatment depended upon the rank and wealth of the dead. In the case of a poor man the bandages would be coarse; but if the deceased was wealthy they were of the finest linen. Each finger and limb were bound, twelve hundred and fifty yards having, in some cases, been unrolled by investigators—nearly two-thirds of a mile of bandages three or four inches in width.

There were many methods of making mummies, and time has shown that those of the Theban epoch were the best, the bodies after centuries being so flexible that they can be bent without breaking. This was, it is supposed, due to the expensive ingredients employed.

Mummies of some kind are found in many lands, and it is interesting to note that they occur in various parts of the United States, possibly the most interesting coming from the caves of Arizona. The two shown in the accompanying photographs, by Maude, of Los Angeles, were found in cliff dwellings in that territory. According to Lawson, the Santee Indians of South Carolina preserved their dead by embalming with certain roots, after which they dried the body and covered it with the bark of the pine or cypress. Finally, the skeleton was secured and wrapped in cloth made of opossum's hair, the remains then being placed in a box. Others were wrapped in deerskins and stored in the Quiogozon, which was the royal tomb. Perfect mummies have been found in the caves of Kentucky. One enveloped in rough clothes and wrapped in deerskins was found ten feet below the surface in a cave. It was the body of a woman, the hair shaven off according to the custom. Beneath the outer deerskin was another skin of the deer; then came a cloth formed of twine. Inside of this was a cloth resembling this, but covered and ornamented with brown feathers.

The natives of the Northwest embalmed their dead. The body was usually doubled up and placed in a case of fur or grass, made for the purpose. The Alaskan Commercial Company secured from the seal islands of the company a mummy supposed to be one hundred and fifty years old, which shows that this method of

burial has been followed many years. It was discovered in a cave, on Kagamale Island, filled with sulphurous vapors which came from crevices in the rock. Eleven mummies were found. One, the chief, was held by a basket-like coffin, or structure, four feet in height, and evidently made with the greatest care. The material with which the remains were wrapped were matted, woven from seaweed in a very skillful manner, and skins, among which was a fine skin of the sea

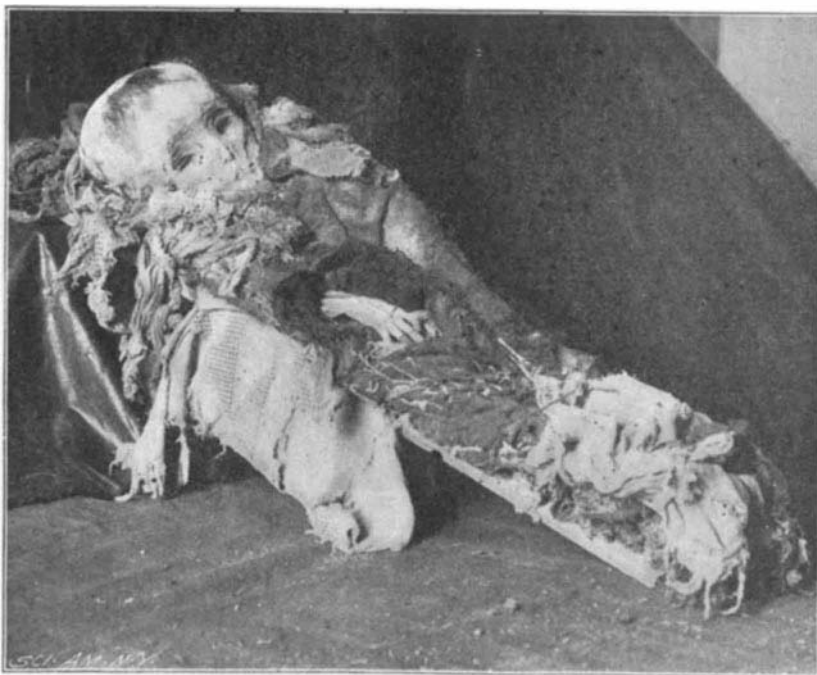


INDIAN MUMMY FROM CLIFF DWELLING, ARIZONA.

otter; over all was a net made of the sinews of the sea lion.

In many of the so-called mummies of this continent the body was placed in a sitting position. Several were found by the writer on San Clemente Island, California, doubled up, the head resting on the knees, while in front of the face and behind the head were placed flutes of bone inlaid with the pearly abalone.

The mummies shown in the illustrations have been carefully prepared. The one unopened with distorted face, being well preserved; wrapped in skins and firmly bound and finally incased in a covering of basketry. The so-called mummy caves of Arizona from which mummies have been taken, are very interesting and elaborate in their structure. One is known as Mummy



INDIAN MUMMY FROM CLIFF DWELLING NEAR JEROME, ARIZONA.

Cave Ruin, and is in Del Muerto Cañon and known to the Navajos to-day as Tse-i-ya-kin. It stands about 80 feet above the bed of the cañon on the face of the cliff with a commanding view and is placed in a natural weathering. It is believed that originally there were twenty rooms in the western cave, and fourteen can be distinguished to-day. In the eastern cave about forty-four can be distinguished, and it is estimated that originally the ruin represented ninety rooms, affording a home for possibly sixty people. Many of the rooms are 20 feet wide and 15 feet across,

and were two stories in height. What is called the eastern cave, or the mummy cave, is to-day a most picturesque ruin and steps have been taken by the government for its preservation. The houses of stone are packed in under the great cliff where the stone has weathered out and the falling ruin has aided materially in forming the talus that reaches down, covered with the stones used by the ancient builders, to the bottom of the cañon. Windows and doors remain intact in many rooms and the stories can readily be traced by standing walls. If these picturesque ruins were in some valley in Egypt they would attract the attention of thousands, but here they are visited by the student and the scientific man alone, and by but an occasional tourist who strays into the region.

In Egypt, mummies of crocodiles and cats are common, but the mummification of animals in America appears to have been rare. On the island of San Clemente mummified dogs have been found, and are to be seen in the museum of Throop University, Pasadena. They were tanned in some way and then wrapped in basketry of seaweed.

Inventors and the British War Office.

A letter was recently published in The London Times complaining of the British board, which inquires into military inventions, and the writer describes his experience with this board. The problem which he was endeavoring to solve was how to obtain accuracy for a dropping, or high angle rifle fire, a most important subject in view of the present conditions of modern warfare, for it is well known that in the engagements in the present war, the British troops rarely saw a Boer at all. Direct fire under these circumstances is almost useless except at very close quarters. There would be no escape from a high angle fire if it could be compassed. The experiments of the writer were in the direction of affixing a small, simple and economical apparatus to the rifle so that a man would know at what angle to hold his gun in order to drop a bullet in any given range. Having convinced himself that his invention was a good one he wished to have it examined by the War Office with a view to adoption. He therefore communicated with the War Office, briefly stating his idea and this was forwarded to the Director General of Ordnance, who replied as follows: "Sir: With reference to your letter concerning an appliance for adapting rifles to high-angle fire, I am directed by the Secretary of State for War to inform you that he will not trouble you in the matter. I am, Sir, your obedient servant (Signature illegible), Director-General of Ordnance."

While the British War Office cannot be expected to concern themselves with inventions of cranks, at the same time it might be supposed that the writer of the letter who was no other than Dr. A. Conan Doyle, the well-known author, would have received some consideration. There is no more promising field at the present time for the inventor than in articles intended for the military establishment. We are pleased to know that our own Department of War has, on many occasions, given gratifying support to the inventor by ordering guns, gun carriages, etc., made and tested on a large scale, and the results have been most satisfactory, as the government now controls many important inventions.

The Transportation of Tea.

A Siberian paper published at Tomsk, gives some curious details regarding the Russian tea caravans that transport vast quantities of tea and distribute it in various parts of Siberia and Russia. During the first twenty days of January, 1899, there was an average of a thousand sleighs per day loaded with tea passing through Tomsk. The ordinary size of the tea caravans are from 50 to 70 sleighs, but it is not unusual to have from 200 to 300 sleighs in a caravan. The average load is five bales, each bale weighing about a hundred pounds. Five sleighs are fastened together and are drawn by one horse and are attended by one man. On the rear sleigh of each group is tied a bundle of hay and a measure of oats so that the next horse behind may feed during the march so that the caravan does not need to halt for the purpose of feeding the horses. The front horse is changed occasionally so as to give him an opportunity of feeding also. The caravans travel night and day and only stop at villages where the weary horses are exchanged. The drivers sleep on the sleighs while traveling. When the Trans-Siberian road is completed tea will be carried from China and distributed through Siberian and Western Russia with the same despatch as freight is handled in the United States and twelve cars will carry as much freight as a thousand sleighs drawn by two hundred horses and attended by two hundred men, the difference in the cost of the tea to the consumer and the saving in time and transportation may be readily imagined.

The Agrostological Work of the Department of Agriculture.

The division of agrostology performs important labors in the Department of Agriculture, and before describing them it is perhaps well to define the word. "Agrostology" is that branch of botany which treats of grasses. The grasses and forage plant investigations have been carried on for many years, and the value and necessity of actual field work as well as the importance of experimental cultures of the grasses and forage plants which we may wish to propagate and introduce into cultivation, are no longer questioned. Observations in the field have enabled us to understand the forage problem and needs of the several sections of the United States and materially advance our knowledge of the native grasses and forage plants, their distribution, their relative abundance, their value, before cultivation, peculiar conditions of soils and climate, and the means by which they are propagated, and their possible value to agriculture and in the economic arts. No country offers so large a number of grasses and forage plants as are to be found in the United States. There are native species adapted to nearly every condition of soil and climate and selections can be made from among them to meet almost every requirement of the farmer or the stockman. In order to secure information as to the best variety of crops to meet the needs of the various sections and climatic divisions of the country, it is necessary to study the conditions that prevail such as the soils, rainfall, drainage and temperatures which govern the development of the plants in a given area. Most of the force of the division has been sent into the field, or special agents are employed to learn by direct observation the habits and distribution of native grasses and forage plants. Experimental work has been conducted at Abilene, Texas, with excellent results and experiments with grasses and forage plants have also been made in Eastern Washington at Yakima and Walla Walla in co-operation with the Northern Pacific Railroad and the Oregon Railroad and Navigation companies.

Among the most interesting and promising varieties tested are Turkestan alfalfa from the dry regions of Western Asia, and the oasis of alfalfa from North Africa. The field experiments of the division are being largely carried on through co-operation with prominent farmers in the different parts of the country and with some of the State Experiment Stations. The investigation of the self-binding grasses has been continued and observations of the native sand-binders have been extended southwesterly along the Atlantic coast to Florida, and also at various points along the Pacific and in the sandy regions of Eastern Oregon and Washington. Some promising species of this group of grasses have been discovered specially in the Pacific coast region and experiments in propagating them have been intro-

duced. During the past fiscal year 6,246 sheets of mounted specimens have been added to the collection of herbarium and the total number added during the past five years is 19,078. Many thousands of specimens have been submitted to the division for identification since its organization. Between 3,000 and 4,000 were determined by correspondence during the year. A number of bulletins, circulars, etc., were issued. The cultivation of grasses and forage plants on the department grounds has been continued and has been a source of attraction throughout the season. This grass garden has given opportunity to those interested to know the appearance and growth of a great number of important grasses and forage plants. During the year the division has distributed seeds of 185 varieties of grasses and forage plants. They were nearly all sent to experiment stations or to correspondents who had requested an opportunity to co-operate with the division in this work.

It is recommended that the appropriations for the division be increased, as there are constant demand for the extension of these investigations into new fields. Thus, for example, urgent demands come from the Gulf coast region where the question of raising forage upon lands whose fertility has been exhausted by long-continued cultivation of cotton, is now engaging the serious attention of Southern planters, and the holding of drifting sands about the fortifications along the coast, has been called to the attention of the division by the War Department, and it is imperative that experimental trials of known sand-binding grasses should be made in a number of localities where damage is being caused by blowing sands.

The railroads whose lines pass through sandy districts, where the driftings often seriously impede traffic, and private parties or corporations whose lands are being made desert wastes by shifting piles of sand, are demanding information which can only be offered by practical demonstration of the adaptability of certain grasses to fixing these destroying sand drifts. Inquiries concerning sand-binders have come to the division even from Japan, where the city of Niigata, on the northwest coast, is threatened with destruction by sand blowing the sea.

The Risks of Siphons.

The ordinary charging pressure for the siphon bottle is from 120 to 150 pounds to the square inch. When a bottle so charged sustains a fall of only a few feet the jar is liable to cause an explosion, and the same result may occur by exposure to heat. The Druggist's Circular recently had an excellent article upon the risks of the siphon in which a number of damage cases are cited, and it recommends that a special warning label setting forth the risks of handling siphons be

placed on every bottle. The moral obligation to protect one's fellows from danger is obvious enough and pharmacists and others who sell siphons could readily force the bottler to affix such labels. The siphon should always be carried by the head. Children should be specially warned to do this because they are apt to find the bottles heavy and clasp them close to the body. Sudden changes of temperature should be avoided and the cold bottle should not be grasped with the hand. The courts seem to have always held in siphon accidents that the bottler was responsible. If there was the slightest defect in the siphon or the slightest carelessness in handling them. The driver of a wagon containing filled siphons was delivering some of them to a customer; one of the bottles fell and struck the ground where it burst into fragments, striking a man in the face permanently impairing his vision. A suit was brought against the manufacturer whose wagon was delivering the water. A verdict of \$3,000 damage was obtained. The case was carried to the Appellate Division of the Supreme Court and the judgment was affirmed.

The Current Supplement.

"A Visit to the Exposition of 1900" forms the first-page article of the current SUPPLEMENT, and is fully illustrated with a number of views showing the gradual transformation which has been wrought in the last few months in the Esplanade des Invalides, and other portions of the grounds. "The Pan-American Exposition" forms another interesting article and is accompanied by an engraving and a plan of the Exposition. "Is the Steering of the Modern Screw-Propelled Vessel Defective?" is by the late Captain Cornelius W. McKay. The first installment is in this issue. "The Nature of the Elements," is by Dr. Curt Schmidt, and is accompanied by descriptive engravings. "The Doctor Outside of Medicine," is the most interesting article by Dr. William L. Stowell, M.D., and treats of the subject in an exhaustive manner.

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RECENTLY PATENTED INVENTIONS.

Agricultural Implements.

PLANTING ATTACHMENT.—SAMUEL W. NELSON, Munday, Tex. This inventor has provided a simple form of planting mechanism adapted for ready attachment to any cultivator and for operation by a ground-wheel of the cultivator. The operating devices for this planting mechanism are so constructed that the seed can be dropped at any desired interval. The device meets all the requirements of the average farmer.

Bicycle-Appliances.

BICYCLE SUPPORT.—FREDERICK BARRY, Silverton, Colo. The bicycle-support consists of clips arranged for attachment to a bicycle frame. Rods extend from one clip to another and connect the clips. A runner has ears bent around the rods, whereby it is fitted to slide thereon. Supporting rods are pivotally secured to the runner, and links are pivotally secured to the lower clip and the supporting-rods. The device can be applied to or removed from the lower brace merely by opening the clips.

Mechanical Devices.

FOOT-POWER.—ZEB McCUNE, West Alexander, Penn. The foot-power mechanism is especially adapted for operating a dash-churn, although useful for other purposes. The foot-power is so constructed that a steady and continuous movement is imparted to the dasher, with little exertion. A rock-shaft mounted in a frame is provided with a bevel-pinion. In planes at right angles to the plane of the pinion are two beveled segmental racks meshing with the pinion at opposite sides. A treadle is attached to each rack, the treadles being projected downward from the racks into proximity to the plane of the frame-brace, permitting the treadles to be rocked in opposite directions to drive the rock-shaft.

SACK-TYING MACHINE.—JESSE W. PEDIGO, Harrodsburg, Ind. The machine is particularly adapted to tying paper flour-sacks and comprises means for crimping and closing the mouth of the sack and securing it with knotted thread or cord. The apparatus can be used for other forms of similar work. Indeed, the principle covered by the patent extends to the work of tying packages of any sort. For tying sacks, the apparatus has a number of carriers on which the sacks are placed and which carry the sacks successively to devices for closing and temporarily holding closed the mouths of the sacks. Then the sacks are moved to the knotting devices which knot the thread around them. This done, the temporary closing devices release themselves, whereupon the bag can be taken from the machine. The apparatus is an

entirely new invention in its class. The claims granted are very comprehensive.

Miscellaneous Inventions.

TIME-ALARM MECHANISM.—CHARLES SCHMIDT, 1908 Frenchmen Street, New Orleans, La. The apparatus consists of a clock-train which drives a main wheel having projectible parts arranged to operate a lever. A second lever is connected with the first lever, and a fly-wheel is arranged to be held and released by the second lever. Special alarm mechanism is provided, arranged to be operated by ordinary striking mechanism. The device is intended for use in factories, school-houses, residences, where it is desired to give signals at certain times. The mechanism is to be set in advance to secure the sounding of the alarm at this time.

COMPOSITION OF MATTER.—Captain WILLIAM PRAMPOLINI, San Luis Potosi, Mex. This composition is a substitute for india-rubber, and consists of the gummy matter of the shrub called *Synantheroeas Mexicanas*, by botanists and Indians, "Yule," "Copalin," and "Jiguhite." The gummy matter is obtained by using benzine, gasoline, or other hydrocarbons. It may be vulcanized perfectly, and is better than most india-rubber, because it is free from all mechanical impurities, and needs no preliminary cracking, grinding, and washing. It is cheap, easily obtained, and saves machinery in manufacture.

PACKAGE-HANDLE.—HENRY H. FLANDERS, Boston, Mass. The carrier comprises a trough-shaped handle having slits extending longitudinally from its ends and terminating in enlargements or apertures. A yoke having a central member extends on the upper surface of the trough between the apertures, then passes downward through the apertures, and has horizontal offsets underlying the slitted portions of the handle. Hooked end members extend downwardly from the offsets. No solder or fastening means are required to hold the yoke in position in the handle. Consequently very little labor is required in assembling the parts, thereby rendering the cost of manufacture exceedingly low.

NON-REFILLABLE BOTTLE.—WILLIAM J. EN EARL, Salida, and OSCAR B. CRITCHLOW, Grand Junction, Colo. The bottle has a valve seated in the lower portion of the neck. A protector, seated in the upper portion of the neck, is formed of two sections with an interlocking recess and lug. The upper section has a cavity in its lower portion. The two sections have passages out of registry with each other. The protector has recesses in its side walls, which recesses register with the recesses in the neck of the bottle. Springs fit in the registering recesses to hold the protector in place.

LANTERN.—CHARLES H. KOSTER, Brooklyn, New York city. The lantern comprises a frame having an integral back and base, the base being provided with means

for removably holding a lamp-chimney and an illuminating device. The lantern can be hung on the wall by hooks. A shelf extends forwardly from the top of the back over the lamp-chimney to form a wind-break or shield. This device is cheap and answers all the requirements of a more expensive lantern, when light is only temporarily required.

HARNESS.—CARL B. OLSEN, Canby, Minn. The object of the invention is to provide an attachment for all kinds of harness, especially double harness, which will greatly reduce the pressure of the collar upon the neck of a horse. The collar will not move backward or forward when the horse is hacking, but will remain in its proper position, thus preventing sore necks, especially since the weight of the vehicle or its pole or tongue will not be sustained by the collar.

EYEGGLASSES.—FRANK M. THOMSON, Wilmington, Del. This invention relates to a peculiar construction of the bridges of eyeglasses, the object being to provide better means for attaching and adjusting the bridge with respect to the lenses. The bridge has each end portion bent to form two loops, the one projected upwardly and the other downwardly. The loops permit the adjustable attachment of the bridge to the lenses. The downwardly-projecting loop has its lower end constructed to bear against the nose. A plate is mounted at each end of the bridge to form additional bearing surface.

Designs.

FASTENING EYE.—E. STEWART, care of JOHN STEWART, 71 Broadway, Manhattan, New York city. The design provides a very simple and ingenious fastening eye which can be cheaply manufactured. It is said that the eye is a most efficient device for holding the back of a shirt-waist in position, possessing an additional merit in the fact that it can be sewn permanently in place.

HORSESHOE-PAD.—JACOB KRONENBERG, Brooklyn, New York city. The pad is made of rubber and is so constructed that the horse can gain a firmer foot-hold than with an iron shoe. Hygienically the pad is in every way better than the shoe.

FISH-CLEANING KNIFE.—WILLIAM J. IRWIN, Manhattan, New York city. The knife is a double-bladed cutting instrument intended especially for cutting out the spinal column of a fish. The blades and connecting back are formed especially for the service which the knife is to perform.

BODY-PORION FOR BELTS.—LOUIS SANDERS, Brooklyn, New York city. The design consists in the marginal contour of the body portion of a belt, in which the longitudinal lines of the body section are oppositely curved at the central portion of the body are continued to the ends of the section by converging the lines more or less straight. The surface ornamentation is embossed on the outer surface of the body and represents longitu-

dinal cord structures extending from end to end of the body.

NOTE.—Copies of any of these patents will be furnished by Munn & Co. for ten cents each. Please state the name of the patentee, title of the invention, and date of this paper.

NEW BOOKS ETC.

CYCLOPEDIA OF AMERICAN HORTICULTURE. By L. H. Bailey, assisted by Wilhelm Miller. Vol. I—A to D. New York: The Macmillan Company, 1900. Quarto. Pp. 509. Price \$5.

The handsome volume before us comprises suggestions for the cultivation of horticulture, plants, descriptions of species of fruits, vegetables, flowers and ornamental plants sold in the United States and Canada, together with geographical and biographical sketches. It is to be in four volumes illustrated with over 2,000 original engravings. The author is eminently qualified for his task, being Professor of Horticulture at Cornell University, and the author of several authoritative books. The plan of work is excellent and there are a number of half-tone engravings. The majority of the illustrations are line cuts and they serve to elucidate the text. The information given is precisely what the horticulturist and the general reader is desirous of knowing, thus for example, take the cranberry, and we find full information not only of its botany but also its cultivation, showing cranberry marshes and the gathering of the berries together with the history of the industry, its volume and the prevailing prices, together with excellent advice to those who are seeking to make a start in the industry. Many of the articles are signed. The publishers are to be congratulated upon the production of such an eminently practical book.

DIE EISENKONSTRUKTIONEN DER INGENIEUR-HOCHBAUTEN. Ein Lehrbuch zum Gebrauche an technischen Hochschulen und in der Praxis. Von Max Foerster. II. Lieferung. Leipzig: Wilhelm Engelmann, 1900. Pp. 113 to 192, Plates II. to VI. Quarto. Price paper, \$2.75.

The second installment of Foerster's "Eisenkonstruktionen der Ingenieur-Hochbauten" is devoted to a description of iron constructive parts and iron framed structures. The chapters are characterized by the same clearness of expression and explanation to which we drew attention in our notice of the first installment of the work.

DIE MODERNE CHEMIE. Eine Schilderung der chemischen Grossindustrie. Von Dr. Wilhelm Bensch. Illustrated. Parts 21 to 25. Vienna: A Hartleben, 1900. Each part 70 cents.