

The Early History of Literature.

In a most interesting article by Amelia B. Edwards, in the Contemporary Review, entitled "The Art of the Novelist," the author says:

One of the most ancient examples of fiction in the world, one which has survived the rise and fall of many an ancient and many a modern empire, is an Egyptian romance entitled "The Tale of the Two Brothers." We have the original manuscript in the British Museum. It is written on nineteen sheets of papyrus, in a fine hieratic hand, and it was penned some three thousand two hundred years ago by a Theban scribe named Ennana. This Ennana was Librarian of the Palace to King Merenptah, the supposed Pharaoh of the Exodus; and he appears to have written the tale by order of the Treasurer, for the entertainment of the Crown Prince, Seti-Merenptah, who subsequently reigned as Seti II. This prince has signed his name in two places on the back of the manuscript, these being probably the only autograph signatures of any Egyptian king which have come down to our time. This most venerable and precious document was purchased in Italy by Madam d'Orbiney, who sold it in 1857 to the authorities of the British Museum; and it is now known as the d'Orbiney Papyrus.

That the ancient Egyptians were novelists and readers of novels was what no one suspected till Madam d'Orbiney purchased her famous papyrus in 1857. The Egyptologists of Europe were, in fact, fairly scandalized to find that these "grave and reverend signiors," whose mummies were so eminently respectable, had tastes as frivolous as our own. Since that time many more specimens of ancient Egyptian fiction have come to light, tales of adventure by land and sea, tales of enchantment and magic; even historical romances and ghost stories.* These discoveries have cast a new light upon the early history of literature. They show us that Egypt was not only the birthplace of all our arts and all our sciences, but that the Valley of the Nile was in truth the cradle of romance. It was from Egyptian sources that Herodotus derived many a narrative which he innocently accepted for fact and repeated as history; and it is from these sources that the Arab story-tellers of the middle ages draw many an incident familiar to us all in the pages of "The Thousand and One Nights." "The Shipwrecked Mariner"† (who, by the way, performs the astonishing feat of sailing up the Nile as far as Nubia, and thence gaining the open sea) is cast, like Sinbad the Sailor, upon an island peopled by serpents. General Tahuti, in a story called "The Taking of Joppa,"‡ introduces his soldiers into the beleaguered city by means of a stratagem less successfully attempted in after-ages by the "Forty Thieves;" that is to say, he conceals a certain number of men in big jars which are carried by others of their comrades, disguised as captives laden with booty.

Our modern novelists are well pleased when our stories find favor in many lands, and are translated into many tongues; but if tried by this test, the second part of "The Tale of the Two Brothers" throws all our modern successes into the shade. We find it reproduced in every age and in every civilized land.

The fact that novels and tales were written by the scribes of Egypt before Hebron and Zoan were founded, is indeed very extraordinary. And we must remember that these ancient romances are the parent-source of all the light literature of mediæval and modern times. The great Mesopotamian nations had apparently no school of fiction. The clay cylinders and tablets of Borsippa, of Warka, of Babylon, of Nineveh, have as yet yielded nothing in the shape of a popular tale or a popular song. Legends of gods and heroes, chronicles of victories, cold-blooded records of hideous tortures inflicted on prisoners of war, calendars, contracts, accounts, magical formulæ, and the like, have come down to us in abundance from the libraries of these grim, practical and eminently disagreeable people; but nothing, absolutely nothing, which brings them into touch with ourselves, upon the common ground of imagination or sympathy. When, therefore, we lose sight of fiction in Egypt, we lose sight of it for a long time in the East, and follow it to the West, to Greece and to Rome.

Trial of Mortar Batteries at Sandy Hook.

A very interesting series of experiments were conducted recently at Sandy Hook by the Board of Ordnance and Fortification to ascertain the value of mortar batteries in repelling the attack of an enemy. The idea was to determine how far and with how much accuracy they could be thrown when it was desired to perforate the deck of an enemy's war ship. A battery of mortars consists of sixteen pieces, and the trial consisted in setting these off singly and in groups of four. By carefully adjusting the angle of the gun, the single shots were made to hit the target repeatedly. The purpose of discharging four guns at a time was to ascertain if the shots could be made to fall at the same point. The

* An English translation of certain ancient Egyptian tales, in illustrated form, will shortly be issued by Professor Flinders Petrie.

† From a Twelfth Dynasty papyrus.

‡ From a papyrus of the Eighteenth Dynasty.

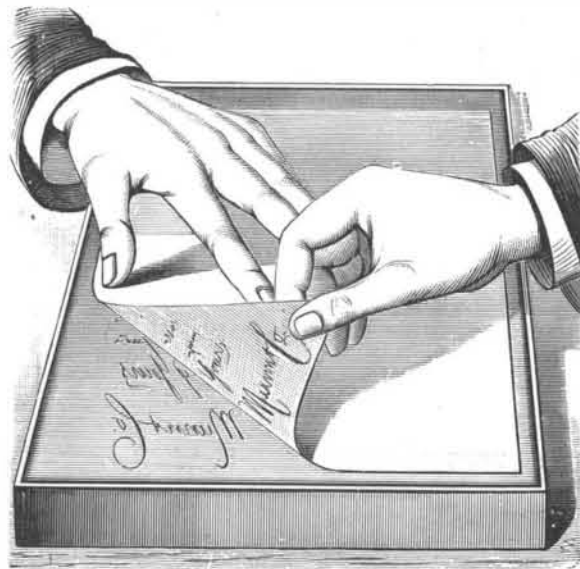
experiments on land showed that the shots fell within a distance of thirty-two feet of each other after traveling a distance of 3,000 yards. In the case of the shots fired at a target on the water, it was found that the four shots fell so close together as to make a single splash, and every shot hit the target or came within a few feet of doing so. The experimenters declare that they were well satisfied with the result.

EXPIRATION OF THE HEKTOGRAPH PATENT.

The invention known as the hektograph (from the Greek ekaton, hundred, and graph, write) consists in making a pad or cake of gelatine, glycerine and water. This forms a stiff jelly, and if a sheet of paper having lines drawn or written with aniline ink is lightly pressed upon the jelly, a reversed copy of the lines or writing will be received thereon. The ink is absorbed by the jelly to such an extent that many successive copies of the lines or writing may be taken by simply pressing successive sheets of dry blank paper upon the inscribed jelly. It forms a most convenient and excellent method of duplicating letters, sketches, etc. The mode of use is illustrated in our engraving.

A United States patent for this invention was granted June 1, 1880, to the Austrian inventors, Messrs. Kwaysser and Husak, and under the ordinary term of the law the patent would expire June 1, 1897. Section 4,887 of the United States Statutes, however, provides that "every patent granted for an invention which has been previously patented in a foreign country shall be so limited as to expire at the same time with the foreign patent, or, if there be more than one, at the same time with the one having the shortest term."

Several foreign patents were granted for the above invention prior to the American patent, among them an English patent, which expired November 13, 1894; consequently, the American patent expired on that



date, and the invention is now the property of the public, and any person may now freely make, use, and sell the hektograph.

An approved formula is as follows:

THE COPYING PAD.

Gelatine, by weight.....	1 part.
Glycerine.....	4 parts.
Water.....	2 parts.

THE INKS.

1. Methyl violet.....	1 part.
Water.....	7 parts.
Alcohol.....	1 part.
2. Rosaniline.....	2 parts.
Water.....	10 parts.
Alcohol.....	1 part.

To prepare the pad for use it is necessary to pass a wet sponge lightly over the face of the gelatine and allow it to nearly dry before taking the first copy. If this precaution is neglected, the face of the pad will be ruined by the first transfer.

Electric Traction in Paris.

Two electric tramways, both operated on the accumulator system, are at present in successful operation in Paris. One runs from St. Denis to the Madeleine and the other from St. Denis to the Opera, both lines belonging to the Compagnie des Tramways de Paris et du Departement de la Seine. The length of each line is about 5¾ miles. The electricity generating station is situated at St. Denis, where the accumulators for both lines are charged. The generating plant comprises three Desrozier's dynamos driven by three Corliss engines, each of 125 horsepower. The dynamos, which were supplied by the Maison Breguet, of Paris, run at 600 revolutions per minute, and give 230 amperes at 260 volts pressure, being arranged in quantity.

The car chest is supported on two single-axle trucks connected together by an arrangement of springs to allow of passing round curves. Each car will accommodate fifty passengers. The accumulators, which are of the Laurent Cely type, supplied by the Societe pour

le Travail Electrique des Metaux, of Paris, are placed under the seats of the car. Two batteries are allotted to each motor car, each battery consisting of 108 cells having 11 plates, inclosed in ebonite cases. The dimensions of the plates are: Depth 200 mm., width 200 mm., or 8 inches square, and thickness 0.006 mm., while the weight of the active material is 38½ pounds per cell. The accumulators are rapidly charged at a constant potential of 260 volts. The capacity of a battery of accumulators is 230 ampere hours, equal to 52 horse power hours, sufficient to run the car for a period of six hours, equal to from four to six consecutive journeys. The average distance traveled by each car is 135 kilometers per day, or about 83 miles. The efficiency of the accumulators is said to be 70 per cent. The average yield is 35 amperes on the level and 55 amperes on grades of 25 mm. per meter. In practical operation deep grades occur which necessitate a yield of 70 amperes, equal to 4 amperes per kilogramme of active material. The track consists of both Vignole rails and Broca grooved rails, the former, weighing 48½ pounds per meter, being laid in the suburban roads, while the Broca rails, weighing 92½ pounds per meter, are laid within the city limits. One charge of the accumulators would suffice for a journey of 120 kilometers on the Vignole rails and only 65 kilometers on the Broca rails. The upkeep and the charging of the accumulators is done under contract by the Societe pour le Travail Electrique des Metaux, at the rate of 16 centimes (a little over 3 cents) per car kilometer, or not quite 5 cents per mile.

Coming now to the motors, these are two in number, and of the Manchester type, with Gramme ring inductors. They are excited in series, while the brushes are composed of four carbon blocks. Connection is made between the motors and the axles by two systems of gear wheels in the ratio of 12 to 1, the first series running in an oil bath. Each motor can develop, at 1,350 revolutions per minute, a total of 10,000 watts at 230 volts pressure. Under these conditions the efficiency between the terminals of the dynamo and the axles of the trucks is said to reach 73 per cent. It should be added that both the trucks and motors were supplied by Messrs. Averly, of Lyons, and that the total weight of a motor car, including accumulators, motor, and the full number of passengers, is nearly 13½ tons.

Effect of Machinery.

In mechanical weaving the progress, says the Manufacturers' Gazette, has been great, not only in the quality and character of the work done, but in the amount of production. There is scarcely a woven design that cannot now be produced on the power loom. But the advancement in power loom weaving is more appreciated in the speed at which the loom can be run and the facility with which it can be tended. In this, England is much ahead of the Continent, and the United States of the world. In 1830 the average speed of the cotton loom on plain goods was 80 to 90 picks in England, while to-day it is 195 picks. In some instances the speed is run up to 240 picks a minute. These speeds are theoretical, and indicate the possibilities of the machine. As a fact, the effectiveness of the loom is 8 to 16 per cent less, due to stoppages from various causes. The difference between the theoretical and practical efficiency of the loom is owing in an important degree to the efficiency of the operative that operates it. This is seen, somewhat, in the number of looms that one person runs, which is considerably greater in the United States than in England, and greater in the latter country than on the Continent. The records of a large weaving mill in Hyde, which has remained in the hands of the same family for the period covered, 1832-90, show an increase in the weekly production per operative of over 140 per cent, and at the same time a decrease in the unit cost of labor, while the earnings per weaver have been increased nearly 90 per cent, notwithstanding a reduction in working hours, per week, of over 24 cent. Not only have the earnings increased in this proportion, but their buying power has increased even more, or 220 per cent, based on the price of flour. According to Ellison's statistics, the productive capacity per operative increased 2¼ times from 1844 to 1880, and the cost of labor per pound of cotton manufactured declined nearly 35 per cent.

Desulphurization of Liquid Cast Iron.

The author has solved the problem by the use of the non-oxidized salts of barium, especially the ferrocyanides, which are easily decomposed by heat into iron, carbon and barium. Barium ferrocyanide is obtained by mixing the concentrated and boiling solutions of yellow prussiate and of barium chloride. A double barium and potassium ferrocyanide, obtained by mixing equivalent weights of the two salts in solution, has generally given the best results. The reaction must be effected in the exclusion of air and of every oxidizing action. On melting in a lined crucible, with the cover luted, a mixture of the sulphurous cast metal and of barium prussiate, with the addition of fluor-spar, it is easily perceived that all the sulphur passes into the slag around the ingot.—A. De Vathaire.