

## The American "Cheap Book" Making Machine.



THE "novel" machine is a large web press, similar to the kind newspapers are printed on, but arranged to take curved electrotypes of the pages of a book, instead of a single large metal cylinder casting. There are two cylinders, on each of which 144 pages may be screwed, and as the long strip of paper goes through, first one side is printed, then the other, making it possible to print 288 pages at every revolution. The strip of paper, after being carried over rollers which dry the ink, is cut, folded, and brought together into the shape of an octavo volume, with the edges all trimmed. Every time the great cylinder goes round a novel is printed, folded, and trimmed, and 5,000 of these are turned out every hour, while, if it were necessary, 7,000 or 8,000 might be the quota. From the printing press these are carried to a little machine that looks like a sewing machine, and two wire stitches are taken in the back of each. The stitched volumes are then carried to the covering machine, where they are put side by side in a long feeding trough. At the end of this is a little compartment large enough to take a book, carried on an endless chain running over wheels at each end—indeed, there are a series of little compartments on this chain, and as the chain moves along each one receives a book. As the book proceeds, a wheel running in a glue pot presses against its back, smearing it with glue. A little further along there is a pile of covers that comes up at just the right moment, leaving a cover sticking to the gluey back of the book. Of course, the cover stands out straight on each side, but as it is carried all the way around on the chain, the glue thus has a chance to dry. When the circuit has been made the book drops off on its back, and by falling in between other books the covers are folded up against the sides.

In this way fifty books can be covered every minute. Two hundred and fifty thousand of these paper-cover novels are thus turned out every two weeks, and extra editions of 50,000 or so are often worked in besides. It is the paper which costs the most—nearly five times the price of printing. But this is only about two cents for a novel. The rest of the expenditure—for printing, covers, etc.—is about one cent. The whole is not over three cents, and doubtless is something less than this when great quantities are printed. This machinery is not duplicated in any other establishment. It is doubtless by such processes as these that the ten-cent novels will be made which the syndicate with \$5,000,000 is promising to turn out next fall, in editions of 50,000 at a time.

UPON one of the papyri of the priests of Ammon, found with the mummy of a priest of the twenty-first dynasty named Usaratmis, recently unrolled by Dr. Brugsch of the Ghizeh Museum, there was found the earliest known instance of the use of gold for the purposes of illumination. The process adopted was evidently first to apply a gum or varnish, and then to lay on the gold in a thin leaf.

## The Bookworm.



THE human bookworm drinks from the fount of knowledge springing from brains of different authors, according to his or her taste, but the insect bookworm bores and eats its way through the covers and leaves of books according to its discriminating taste. As we probe into the life and work of this mite of a worm, so rapidly growing extinct, we find it an interesting subject. It prefers old books having paper leaves and leather bindings peculiar to the earlier ages. One volume, printed in 1726 (an edition of the Psalms of David), evidently is the sweetest morsel to this worm, as its destructive work is more visible than in the other three books, bearing the dates of 1740, 1750, 1827. The leather and pasteboard coverings are riddled through and through with tiny holes. The leaves are so closely eaten down that but few whole pages remain. Some of the leaves look as if they were cut with a sharp instrument; even the flaxen threads that held the leaves together were nibbled at.

To demonstrate the fact of its special love for aged books we took several pieces of newspaper, cut the size of the pages of the book upon which the bookworm was working, and placed them in it alternately. In a few days we opened the book to find in every instance the little destroyer had crawled past the newspaper sheets and made its meal upon the time-worn pages of the book. So we were convinced that the bookworm is extremely particular about the kinds of paper it diets upon. It is developed in a tiny ribbed shell, about three-eighths of an inch long, similar to coverings on other small insects; both ends of the shell are sharply pointed. At one end are two hairs or feelers; from this end it emerges when ready to begin its life work. The largest one was five-sixteenths of an inch long; the other two were about a quarter of an inch in length. Its head is somewhat pointed and sharp, necessarily so, for its work in boring. It resembles a very small maggot, but its movement is slower. Exposure to a strong light for a minute will kill it.

The bookworm works systematically; having made its entrance through the leather binding of a book by boring a tiny hole from the outside, it makes paths over the inside upon the pasteboard by burrowing. These roads are perfectly connected and uniform in width, for it lies in each one as it bores; oftentimes it cuts a path back to where it first entered, thus making a double route. When it reaches the leaves it works more leisurely, leaving the traces of its work behind it, with the crumbs of its meals. Its life at longest is but a few months. It was thought booklice were the parasites of bookworms. We placed worms and lice together in a tight enclosure. After waiting a few moments we opened the box, to find the bookworms the sole occupants. This tiny little worker requires tender and delicate handling; a slight human breath will blow it away. It is wonderful the amount of destructive work the bookworm accomplishes in its short lifetime. It is properly called the *rara avis* of the insect world.