morocco is best, but roan is very serviceable. Buckram makes a very strong binding, but it is not so much liked. As to publishers charging more for better sewing, it would, I think, be a mistake, because of the large number of people who are not content with cloth covers. It would be far more satisfactory if many of the books were issued in paper as well; a few of the publishers do so, and make a difference in price for the cloth cover."

To Caoutchouc Leaves in Binding.—A method of fixing together the leaves of books by means of caoutchouc, or indiarubber, is preferred to sewing for many classes of superior bindings. The sheets are cut into leaves, and the back edges being laid evenly, receive a solution of this tenacious material. As each leaf is held merely by the caoutchouc, which adheres to it, the book can be made to lie very flat, similar to type founders' specimen books.

Marbling.—The reason why the water used in marbling should always be distilled, is not generally understood. The *Art Age*, in referring to this, and the further question, whether there is any positive way of telling when the size is in a fit condition—whether it can be preserved by any antiseptic, says: "The water is distilled to get rid of the lime. To distil water you can buy a retort. They can be procured easily and the cost but little. Water is distilled by boiling it in a closed vessel and allowing the steam to pass off through a spout into another closed vessel that is kept cold so as to condense to water. There is no positive way that size can be tested. The proper condition of the size is regulated by the character of the marbling. If it is to be spot it should be thick. It it is to be combed and raked considerably it must be thin. Practice teaches in this regard. There is nothing we know of to prevent the size souring. Keep it cool."

Paper made from the Refuse of Sawmills.—For several months past a machine has been under construction, for the manufacture of paper pulp from sawdust and other refuse from sawmills. An experimental machine was completed some time ago, its workings being detailed in the *Times* at that time. Sawdust, bits of lath, shavings and refuse known as "driftwood," were converted into pulp in a very short time, the product being equal to any pulp manufactured. The working of the experimental machine was so satisfactory that the inventor found no difficulty in interesting others in the invention. The inventor, having completed his machine, made pulp with it to his satisfaction the first time it was tried. The machine is cylindrical in shape and stands on one end. It is fourteen feet and four inches in height, and six feet and two inches in diameter in the clear. The gearing is on top of the cylinder. The sawdust is placed inside the cylinder, 1600 pounds being the charge, and it is reduced to pulp by rollers traveling around the inner surface of the cylinder, the principle being the same as a waggon rolling over a plank road, or the chewing of a bit of wood. These rollers are two hundred in number, and, attached to the shaft, hang on to what is known as the step at the top of the machine, the rollers, shafts, etc, making a total of 20,600 pounds hanging from this step. This apparatus presents a novelty in mechanism, the like of which was never seen before. The entire machine weighs 68,200 pounds; fifteen horse power will operate the machine perfectly, and the steam pressure required is from sixty to eighty pounds. About three hours' time will convert a charge of 1,600 pounds of saw dust into pulp, the product being 1,200 pounds. The *Times* representative was present when the machine was in operation and examined the pulp after being taken from the machine. It showed a fine, long fibre, and a person could hardly believe, without witnessing the operation, that it had been made from sawdust. The patentee has an apparatus for bleaching the pulp. The product is cleansed automatically as it leaves the machine and is carried direct to the bleacher, where it is rendered as white as snow at an expense not exceeding 50 cents per ton.

The invention will work a revolution in paper manufacture. His experements show that a fine quality of letter paper, as well as book, news and wrapping stock can be made from the product of his machine direct, thus doing away with the expense of beating engines and other ponderous machinery common to paper mills. It has already produced writing paper in a variety of shades, as well as all other grades capable of being manufactured from rags, jute, straw, or any other material, and his productions are in every way equal. As the raw material can be had for carting, the manufacture of paper from sawdust pulp effects a wonderful saving.—*Glen Falls (N. Y.) Times.*

Machine for Cutting Cardboard.—A new machine has been devised for separating into single columns of prints (preparatory to punching) a sheet of pasteboard or cardboard imprinted with a congeries of designs or pictures—such, for example, as go to make up a "pack" or "deck" of playing cards. In machines of this class commonly employed the sheet is fed directly in between the feed-rollers, and accuracy of cutting is made to depend on two causes, both variable and imperfect—to wit, first, an extremely skilful manipulation, and secondly, strict rectangularity and uniform thickness of the advancing sheet-edge to the lines of demarcation between the rows of columns of prints to be separated from one another. The difficulty of securing pre requisites causes many sheets to be spoiled in the act of cutting by the running of the cuts over printed matter, or so near to it as to destroy merchantable symmetry of the finished cards. The difficulty is overcome by providing means by which the act of the operator which slips the drive-belt on to the loose pulley is made effective to simultaneously elevated to pressure-roller, thus enabling the attendant to arrange the sheet in strict alignment with his gauge while its forward portion is well advanced under the roller, so that on starting the machine the roller closes automatically down upon the sheet at right angels to the demarcations, with the result of feeding the sheets in strict parallelism thereto, no matter how much out of truth the front edge may be.—*Exchange.*

The Art Union.—The council of the Art Union have acquired the copyright of a very faithful portrait bust of General Gordon; and reproduction of it in terra cotta will be included as prizes in the next distribution.