

scriptions of manufactures in which it is fitted to be available. An inventor, who has made himself completely master of this work, will have obtained a knowledge both of all the principal expedients which have hitherto been employed in mechanics, and of the scientific principles upon which all mechanical devices must depend; and a man so instructed, it may be fairly inferred, will be likely not only to waste but little time in re-discovering what has been already found out, but also to find his efforts in original invention crowned with far more rapid and more satisfying success than would have otherwise attended them.

From the multiplicity of most interesting subjects of which Mr. Babbage has treated, the mere enumeration of which would far exceed our limits, we select only two specimens of the entertainment to be found in the work. The following account of a foreign manufacture would appear incredible, if we did not know to what singular uses the instincts of animals may be directed:—

"Lace made by Caterpillars."—A most extraordinary species of manufacture, which is in a slight degree connected with copying, has been contrived by an officer of engineers residing at Munich. It consists of lace and veils, with open patterns in them, made entirely by caterpillars. The following is the mode of proceeding adopted:—Having made a paste of the leaves of the plant, on which the species of caterpillar he employs feeds, he spreads it thinly over a stone, or other flat substance, of the required size. He then, with a camel-hair pencil dipped in olive oil, draws the pattern he wishes the insects to leave open. This stone is then placed in an inclined position, and a considerable number of the caterpillars are placed at the bottom. A peculiar species is chosen, which spins a strong web; and the animals commence at the bottom, eating and spinning their way up to the top, carefully avoiding every part touched by the oil, but devouring every other part of the paste. The extreme lightness of these veils, combined with some strength, is truly surprising. One of them, measuring twenty-six and a half inches by seventeen inches, weighed only 1.51 grains, a degree of lightness which will appear more strongly by contrast with other fabrics. One square yard of the substance of which these veils are made weighs four grains and one-third, whilst one square yard of silk gauze weighs one hundred and thirty-seven grains, and one square yard of the finest patent net weighs two hundred and sixty-two grains and a half."

One of the most important manufactures of our own country is that connected with the Press, in all its various and complicated operations. The following account of the mode in which a great London newspaper is prepared, will be read with interest in all parts of the kingdom:—

"Another instance of the just application of machinery, even at an increased expense, arises where the shortness of time in which the article can be produced, has an important influence on its value. In the publication of our daily newspapers, it frequently happens that the debates in the Houses of Parliament are carried on to three and four o'clock in the morning, that is, to within a very few hours of the time for the publication of the newspaper. The speeches must be taken down by reporters, conveyed by them to the establishment of the newspaper, perhaps at the distance of one or two miles, transcribed by them in the office, set up by the compositor, the press corrected, and the papers printed off and distributed before the public can read them. Some of these journals have a circulation of from five to ten thousand daily. Supposing four thousand to be wanted, and that they could be printed only at the rate of five hundred per hour upon one side of the paper (which was the greatest number two journeymen and a boy could take off by the old hand-presses), sixteen hours would be required for printing the complete edition; and the news conveyed to the purchasers of the latest portion of the impression, would be out of date before they could receive it. To obviate this difficulty, it was often necessary to set up the paper in duplicate, and sometimes, when late, in triplicate: but the improvements in the printing-machines have been so great, that four thousand copies are now printed on one side in an hour."

"The establishment of 'The Times' newspaper is an ex-

ample, on a large scale, of a manufactory in which the division of labour, both mental and bodily, is admirably illustrated, and in which also the effect of the domestic economy is well exemplified. It is scarcely imagined, by the thousands who read that paper in various quarters of the globe, what a scene of organized activity the factory presents during the whole night, or what a quantity of talent and mechanical skill is put in action for their amusement and information*. Nearly hundred persons are employed in this establishment; and, during the session of parliament, at least twelve reporters are constantly attending the Houses of Commons and Lords; each in his turn, after about an hour's work, retiring to translate into ordinary writing, the speech he has just heard and noted in short-hand. In the mean time fifty compositors are constantly at work, some of whom have already set up the beginning, whilst others are committing to type the yet undried manuscript of the continuation of a speech, whose middle portion is travelling to the office in the pocket of the hasty reporter, and whose eloquent conclusion is, perhaps, at that very moment, marking the walls of St. Stephen's vibrate with the applause of its hearers. These congregated types, as fast as they are composed, are passed in portions to other hands; till at last the scattered fragments of the debate, forming, when united with the ordinary matter, eight-and-forty columns, re-appear in regular order on the platform of the printing-press. The hand of man is now too slow for the demands of his curiosity, but the power of steam comes to his assistance. Ink is rapidly supplied to the moving types by the most perfect mechanism;—four attendants incessantly introduce the edges of large sheets of white paper to the junction of two great rollers, which seem to devour them with unsated appetite;—other rollers convey them to the type already inked, and having brought them into rapid and successive contact, re-deliver them to four other assistants, completely printed by the almost momentary touch. Thus, in one hour, four thousand sheets of paper are printed on one side; and an impression of twelve thousand copies, from above three hundred thousand moveable pieces of metal, is produced for the public in six hours."

ZOOLOGICAL SOCIETY.

The last Monthly Report of the proceedings of the Committee of Science of the Zoological Society, contains several facts of general interest.

The female *Puma*, in the Society's Gardens, brought forth two young ones on the 2d of April. The ground-colour of these is of a paler fawn than that of either of the parents, and they are deeply spotted. The eyelids of one of them were partially unclosed on April 9. The mother, whose temper was always mild, has since become remarkably gentle, purring when the keeper goes into her den, and allowing her young ones to be handled and carried about without appearing

* "The Author of these pages, with one of his friends, was recently induced to visit this most interesting establishment, after midnight, during the progress of a very important debate. The place was illuminated with gas, and was light as the day;—there was neither noise nor bustle;—and the visitors were received with such calm and polite attention, that they did not, until afterwards, become sensible of the inconvenience which such intruders, at a moment of the greatest pressure, must occasion, nor reflect that the tranquillity which they admired, was the result of intense and regulated occupation. But the effect of such checks in the current of business will appear on recollecting that, as four thousand newspapers are printed off on one side within the hour, every minute is attended with a loss of sixty-six impressions. The quarter of an hour, therefore, which the stranger may think it not unreasonable to claim for the gratification of his curiosity (and to him this time is but a moment), may cause a failure in the delivery of one thousand copies, and disappoint a proportionate number of expectant readers, in some of our distant towns, to which the morning papers are despatched by the earliest and most rapid conveyances of each day."

"This note is inserted with the further and more general purpose of calling the attention of those, especially foreigners, who are desirous of inspecting our larger manufactories to the chief cause of the difficulty which frequently attends their introduction. When the establishment is very extensive, and its departments skillfully arranged, the exclusion of visitors arises, not from any illiberal jealousy, nor, generally, from any desire of concealment, which would, in most cases, be absurd; but from the substantial inconvenience and loss of time, throughout an entire series of well-combined operations, which must be occasioned even by short and casual interruptions."