quart, a gallon would cost one shilling; potatoes, say one penny; the tomatoes, sixpence; onions, one penny. At any rate, two shillings would cover the whole cost, which is more than enough for eight persons.

As I am trying to explain how to vary our dinners without increase of expenditure, I will, in the few more receipts I give, confine myself to those that are not otherwise than economical. A very nice and easy way of cooking fish is baking it in a tin in the oven. Take for example a haddock; but the same *method* will apply to hake, cod, soles, plaice, &c. Take a fresh haddock. Take out the bone and stew it in a little stock or gravy of any kind that you may happen to have by you. Boning the haddock is not absolutely necessary, but it is far better to do so. Dry the haddock and flour it. You can then egg and bread-crumb it or not as you think best. It is an improvement, but of course adds to the expense. Place the fish in a dish with a little butter, and turn it over in the butter, or baste it with the butter, if you have egged and bread-crumbed it. Boil the stock, with the fish-bone in it, down to less than half a tumbler, adding adding about a tea-spoonful of chopped onion, and a tea-spoonful of chopped parsley, and a small pinch of mixed savoury herbs. Pour this over the fish in the tin, and occasionally baste the fish. If you have not used egg and bread-crumb, shake a few dry bread-crumbs over the fish, and let them brown, and also a little grated cheese, very dry. When the fish is done, send it up in the tin, if possible by placing the tin in a dish the same shape as itself, only rather larger.

Plaice is a cheap fish, but take care it is not flabby and watery, as then nothing can be done with it. The best way to cook plaice is to fry it in batter. Take the fillets of the plaice, dry them thoroughly, flour them and dip them quickly into some batter, and then into some hot fat deep enough to cover them. Pray remember that this same fat will do over and over again. This fat must be smoking hot almost, and the batter thick.

The way to make the batter is very simple. Get a little milk, and add enough flour to make it thicker than double cream. Work it in a basin with the back of a wooden spoon till it is quite smooth; add also a little pinch of salt. If you make your batter sufficiently thick with the flour, have your fat sufficiently hot, and deep enough, you cannot fail. Without these essentials success is impossible. Send the fish to table quickly, as it gets sodden by being kept hot. As soon as the batter turns a nice light golden brown colour the fish is done. A little dried parsley can be fried in the same fat, and sent up round the fish as a garnish, as well as to be eaten with it.

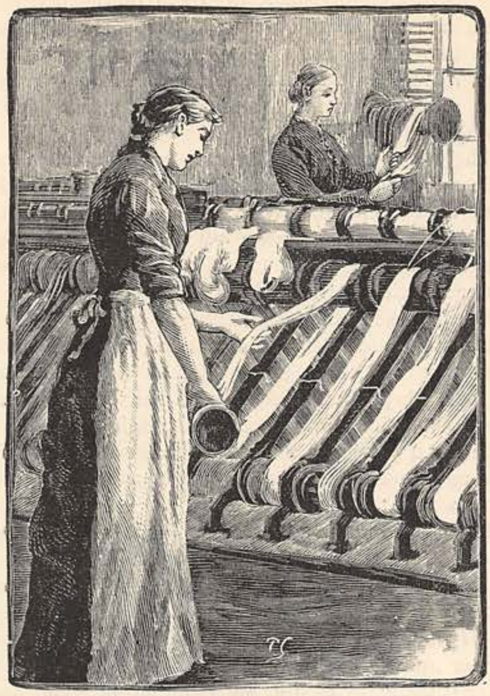
A very nice method of cooking fish is what is known as *à la Maître d'Hôtel*. *Maître d'Hôtel* sauce is made as follows:—Take a little good melted butter, and add to it some chopped blanched (*i.e.*, parboiled) parsley and some lemon-juice, with, of course, a little pepper and salt. The highest-class *Maître d'Hôtel* sauce is made by melting some butter in some good béchamel sauce, then adding the parsley and lemon-juice; consequently, whenever you have a little white stock left you can use it up this way. Add it to a little boiled milk, and then make the béchamel. The best method of cooking the fish before adding the sauce is, I think, to do it on a gridiron, only the gridiron must be very clean and the fire very clear.

A GLANCE THROUGH AN ELASTIC MILL.

MOST people well know that elastic is a soft substance with a great deal of spring in it, often used for braces, belts, and the sides of boots. Every one also knows that if for the latter purpose an inferior quality of this article is used, it means, after a very few weeks' wear, an unpleasant payment of two or three shillings to the bootmaker for new side-springs. But, excepting this, and that elastic is made of silk or other material and india-rubber, I do not think many people know anything further about it, unless, like myself, they have gone over an elastic mill, and watched the interesting process of its manufacture.

The invention of elastic is ascribed to an officer in the Austrian army. He first manufactured it at Vienna, but shortly afterwards removed to the gay capital of France, where he erected a large factory in the Quartier St. Dénis. The secret of its manufacture travelled to England, and it was soon made here as cheaply as in Paris. We now produce it in such large quantities, that we supply largely to the Continent and also to the greater part of the civilised world. There are only three towns in England where it is made—viz., Leicester, Derby, and Coventry. (I must apologise to the latter, the "City of the Three Spires," for dubbing it a town.) In the former by far the largest quantity is made.

There are many different kinds of elastic, and it is used for a great variety of purposes. In Leicester are made chiefly "boot webs," as that class of elastic is called by the trade. It is estimated that two-thirds of the middle class, and almost all the "upper ten," more especially of the masculine gender, are indebted to elastic for the ease and rapidity with which they can pull off and on their foot-gear. Elastic of another kind is largely used for braces and belts—where would the cricketer be without the freedom of the latter? In the manufacture of the ladies' costumes and of millinery a small piece of another kind of this material is used. It guards a lady's hat from the dangerous assaults of a March wind, and holds her dress securely. For a purpose widely different, yet



WINDING.

another class of elastic is used. The surgeon is indebted to this article (which for his purpose is produced in a superior quality) for his stockings, bandages, and knee-caps. I have now, I think, said enough to show that it enters into the manufacture of many articles, and that it is a material we should find it hard to dispense with.

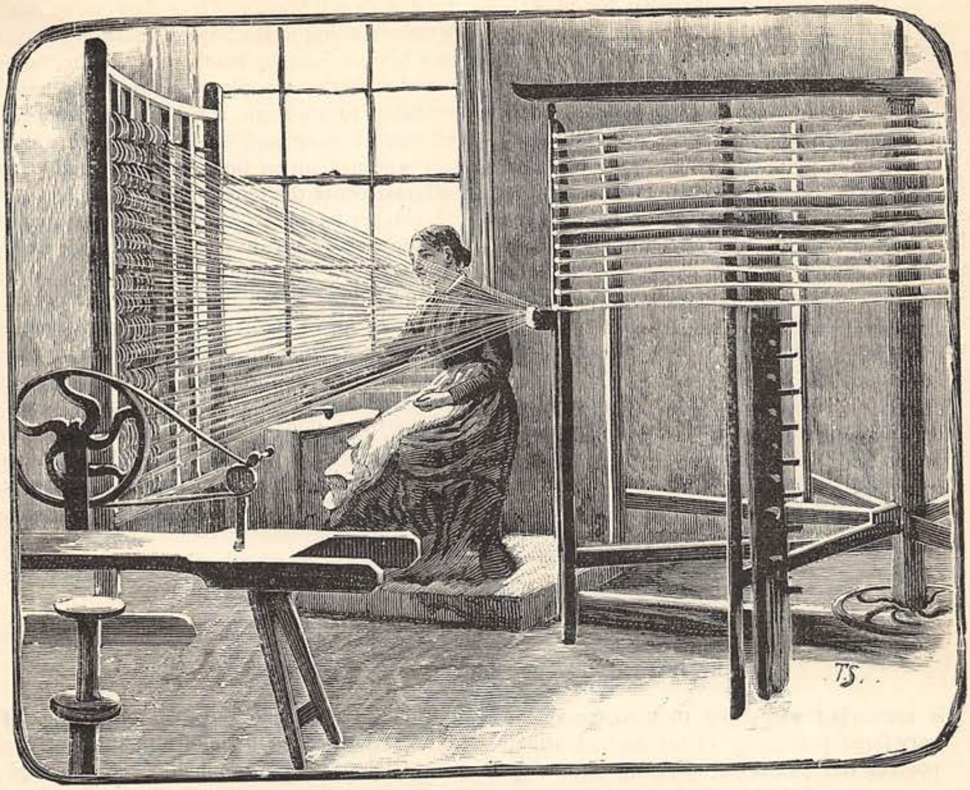
It was in the year 1833 that india-rubber was first applied to articles of dress. This material, then known as "bottle rubber," was cut into narrow strips, and being covered with cotton or silk, was used as straps for clogs—articles then commonly used in muddy weather by English ladies. A few years later a hosiery manufacturer of Leicester made worsted and cotton gloves with bands at the top of this bottle rubber. Braces and garters soon followed. So long as the atmosphere kept at a medium temperature, this article answered very well; but a visit of Jack Frost would make it hard as a hippopotamus-hide, while heat caused it to be far too elastic.

The question was, how to make it insensible to changes of temperature. This secret was discovered by accident. It had been the custom to apply French chalk to the strands of rubber to prevent them sticking together. One day, this material not being at hand, some powdered sulphur was tried as a substitute, and it was afterwards found that the rubber thus treated was less susceptible to changes of temperature, being hardly affected at all by cold. This discovery was followed up, and vulcanised rubber was thus invented. In addition to being rendered insensitive to moderate heat or cold, its elasticity was considerably increased.

It was not, however, till the year 1850 that elastic web was first introduced into gentlemen's boots. It was first used by ladies in the form of a thin strip called a sandal, which coming across the ancle held the shoe on the foot. Very soon afterwards it was introduced into ladies' and gentlemen's boots as side-springs, and quickly became fashionable.

An elastic mill is anything but a picture of idleness—everything and every being are in movement, from the ponderous wheel of the steam-engine to the delicate portions of the weaving looms, and from the muscular arms of the men to the small fingers of the girls manipulating delicate threads of silk. The mill I visited is the largest and oldest in Leicester, and employs several hundred hands. There is great disinclination on the part of the owners of these mills to allow any stranger further than the office door, but, as I was armed with a good letter of introduction to the "powers that be," the open sesame was readily granted me. I inspected first of all the warehouse in which the caoutchouc or india-rubber was stored. This is, of course, the staple article employed in the manufacture of elastic of every kind. Previous to its reception into the mill, the rubber is cut into threads of different sizes, varying from what is termed 8's (eights) to 50's, each thread being perfectly square; the 8's being $\frac{1}{8}$ inch square, and the 50's $\frac{1}{50}$ inch square. The rubber is then wound on bobbins and powdered with either black-lead or French chalk in order to keep it from chafing during the process of weaving, &c. The hands and faces of the little fellows who do this being covered with black-lead imparts to them anything but an angelic appearance. Leaving

WEAVING.



WARPING.

the "rubber room," I come to another portion of the mill where silk is stored. Silk is used for "boot webs" of a superior quality. I must now tell the reader that each thread of rubber has by means of weaving to be carefully covered with silk, cotton, wool, or some other material. Before me, stored away on shelves, were so many hundred pounds' weight of silk that I could not help thinking what an enormous quantity of tiny worms it must have taken to supply that quantity. The silk was in the rough, just as it was received from Italy and China, the two chief silk-producing countries of the world. It would be stored in the mill till required for use, when it would be first sent to be dyed, either to the North of England or to France or Germany, according to the colour required. These dye-works are generally situated (if in the North of England) in some country glade through which a rivulet runs pure and clear till it comes to the dye-works, when it carries away the refuse of that place, and emits, as Shakespeare hath it, the "rankest compound of most villainous smell that ever offended nostril."

After the silk is received again, the second time, into the mill, it is made up into skeins measuring a thousand yards in length. (I should not like to hold a tangled skein of that length for my grand-mother to unwind, much as I respect the old lady.) These skeins have their strength tested by what is called a "dramming" machine, and they are then given out to operatives who are known as "winders" and "warpers." The winder places the skeins on spindles, from whence they are easily and quickly wound on to bobbins. This operation is very similar to that of a lady filling a bobbin for a sewing machine, only the bobbin is more like a rolling-pin, and the sewing machine a piece of mechanism of much larger size. The winders next take the silk back to the stock-room, where it is weighed, and if there is any discrepancy, after allowing a certain percentage for unavoidable loss of weight, they are held responsible for it. The silk on the bobbins is now ready for the "warper," who winds all the threads from a number of these bobbins on to a large frame about eight yards in circumference. The "warper" has to take great care that the threads do not get mixed or cross each other in any way, and it requires considerable practice to perform this part of the operation. An inexperienced hand would soon find every thread before her a mass of entanglement, a thousand times more difficult to unravel than any knotty skein of wool held on impatient boyish fingers. From this frame this silk is transferred to the "weaving beam," where it is carefully woven round the threads of caoutchouc till they are quite covered. Plain or fancy elastic webs are produced in this way, according to the arrangements of the warp and weft employed.

The kinds of elastic such as are used for pocket-book bands, braces, and garters, are produced in a very similar way to boot web, which I have just described; fancy-coloured patterns are made by putting various-coloured silks or cottons, as the case may be, on to the different bobbins. Braided cords, such as are used for hat-guards, are made by what are called "dolly machines." When inspecting one of these machines I noticed a clever contrivance invented by Mr. Jefferson, whereby it was brought to a standstill the instant any single thread out of the great number that was being woven became accidentally broken. Surgical elastic webs are made also in a similar manner, only the materials have to be of the first quality.

After the web is woven it is taken into the warehouse, where it goes through a process of stretching and "gassing" to make it shrink into its normal condition, as during the process of weaving the rubber is kept at its full tension. It is then cut up in different lengths according to the requirements of the customers —this is also done by machines. In the "sandalling department," the machine, having been set by the forewoman to measure the required length, throws itself out of gear and stops. The elastic is then neatly wrapped up on boards, boxed, and packed off to all quarters of the globe.

Machinery has been employed in the manufacture of elastic web a little over thirty years, the first power-loom being erected in the mill of Henry Turner and Sons in 1848. Previously all kinds of webs, being made by hand, were of course expensive luxuries.

Ere leaving the mill, I watched for a few moments the busy scene. The rapid revolutions of the spindles, the quick movements of the looms, went on so smoothly, so easily, that I could not help thinking that they had just discovered the secret of perpetual motion, and were bent on making the most of it.

CHARLES BUCKINGHAM.

THE WORM'S PLACE IN NATURE.

BY DR. ANDREW WILSON, F.R.S.E., F.L.S., ETC.

IT is somewhat surprising to discover that a very large percentage of the animals which possess the power of affecting the earth in a material fashion belong to the lower groups of the animal world. The higher tribes of animals do not materially affect the earth, and do not certainly contribute much, or anything, to its substance. The quadruped or bird, for example, draws its food from the earth, and during its life is returning waste products to the atmosphere, whilst when it dies the matter of its frame passes back to become amalgamated with the earth's substance. Its flesh and soft parts are dissipated into "thin air;" its bones crumble down into lime-dust, and may in turn form the food of plants; so that the once living matter appears before us simply in the light of a loan, which life negotiates for a time with the dead matter around.

Thus, true is it that there exists an unending interchange between the inorganic universe around us and the world of life. But whilst these facts hold true of every animal and of every plant, certain animals become conspicuous by reason of their powers of adding matter, in one sense at least, to the world. The chalk animalcules, which live in all our oceans, and which are named *Foraminifera* by the zoologist, illustrate the contention that even life in its humblest grades may materially alter the earth's crust. These animalcules, each of which, as a rule, is a mere speck of "protoplasm," or living matter, exist in myriads in the ocean of to-day. When they die their limy shells fall to the ocean-bed, and there accumulate, within certain depths at least, to form an ever-increasing layer of chalky ooze. If the bed of an existing ocean were therefore upheaved, and its deposits consolidated, we should be presented with a new series of chalk rocks. In the sense that the formation of chalk is a veritable fact of our own epoch, we may indeed still be described as "living in the Chalk Age."

So too with the corals, which, as most readers are aware, belong to the comparatively low class of the sea-anemones and their kind. These animals erect reefs often of considerable extent, through their power of taking lime from the sea-water and of building that material, either inside or outside their bodies, to form the familiar "corals."

Some of the coral reefs of existing seas assume huge, or even stupendous, proportions. Many of the Fiji reefs are more than 2,000 feet thick; and one reef—the Great Barrier Reef, on the north-east coast of Australia—is 1,250 miles in length, by 10 to 90 miles in width. The power of numbers, strengthened and aided by the element of time—that is, uniformity of action, persisting through long periods of years—is thus seen to accomplish works and measures of a literally immense nature, and which probably could be effected by no other method.

It seems that the humble earth-worm has now to be added to the list of animal agencies that affect the earth's surface, and that play a part in terrestrial affairs none the less powerful because it has been hitherto comparatively unnoticed. The late Mr. Darwin has given us an account of the labours of these humble organisms, and, with his accustomed skill, compiled a literal treasure-house of interesting details concerning their habits and life. The common earth-worm possesses a far higher organisation than popular natural history may credit. It is a member of a very large family circle, or class, known to zoologists as the *Annelida*, and which includes