

its fracture. Beat with a stone on copper pyrites, and it immediately begins to crumble. No acid, by itself, can affect gold; but a mixture of one part nitric, and four parts muriatic acid, is called Aqua Regia, because in this mixture gold does dissolve. A common test for gold, in commerce, is to put nitric acid over it, which has no action if the gold be true. There is, also, a hard smooth stone, called Lydian stone, or flinty jasper, by the mineralogists, and *touchstone* by the jewelers, on which gold makes a certain mark; and the character of the streak made on such a stone will indicate pretty well the purity or value of the gold that makes it.

We have said that when the gold occurs in a deep-seated vein, combined with other minerals, its extraction becomes no longer a simple process. Let us now point out generally what the nature of this process is, and then we shall conclude our brief discussion; for what else we might say, either lies beyond our present purpose, or has been made, by the talking and writing of the last two years, sufficiently familiar to all listeners or readers. Mr. Gardner, superintendent of the Royal Botanic Garden of Ceylon, thus describes the process of extracting gold out of the mine of Morro Velho. This mine, when St. Hilaire visited it, was considered as exhausted; it is now one of the richest in Brazil. Thus Mr. Gardner writes of it:

"The ore is first removed from its bed by blasting, and it is afterward broken, by female slaves, into small pieces; after which it is conveyed to the stamping-machine, to be reduced to powder. A small stream of water, constantly made to run through them, carries away the pulverized matter to what is called the Strakes—a wooden platform, slightly inclined, and divided into a number of very shallow compartments, of fourteen inches in width, the length being about twenty-six feet. The floor of each of these compartments is covered with pieces of tanned hide, about three feet long, and sixteen inches wide, which have the hair on. The particles of gold are deposited among the hairs, while the earthy matter, being lighter, is washed away. The greater part of the gold dust is collected on the three upper, or head skins, which are changed every four hours, while the lower skins are changed every six or eight hours, according to the richness of the ore. The sand which is washed from the head skins is collected together, and amalgamated with quicksilver, in barrels; while that from the lower skins is conveyed to the washing-house, and concentrated over strakes of similar construction to those of the stamping-mill, till it be rich enough to be amalgamated with that from the head-skins. The barrels into which this rich sand is put, together with the quicksilver, are turned by water; and the process of amalgamation is generally completed in the course of forty-eight hours. When taken out, the amalgam is separated from the sand by washing. It is then pressed on chamois skins, and the quicksilver is separated from the gold by sublimation."

Let us explain those latter processes in more detail. If you dip a gold ring or a sovereign into quicksilver, it will be silvered by it, and the silvering will not come off. This union of theirs is called an amalgam. On a ring or sovereign it is mere silvering; but when the gold is in a state of powder, and the amalgamation takes place on a complete scale, it forms a white, doughy mass, in which there is included much loose quicksilver. This doughy mass is presently washed clear of all impurities, and is then squeezed in skins or cloths, through the pores of which loose quicksilver is forced, and saved for future operations. The rest of the quicksilver is burnt out. Under a moderately strong heat, quicksilver evaporates, or—to speak more scientifically—sublimes; and gold does not. The amalgam, therefore, being subjected to heat, the quicksilver escapes by sublimation, leaving the gold pure. The quicksilver escapes by sublimation; but its owner does not wish it quite to escape out of his premises, because it is an expensive article. Chambers are therefore made over the ovens, in which the mercury may once again condense, and whence it may be collected again afterward. But, with all precaution, a considerable waste always takes place. Other processes are also in use for the separation of gold from its various alloys. We have described that which is of most universal application. Let us not omit noting the significance of the fact, that a quicksilver mine exists in California.

EYES MADE TO ORDER.

CONTRADICTORY opinions prevail as to the limits that should be assigned to the privilege of calling Art to the aid of Nature. To some persons a wig is the type of a false and hollow age; an emblem of deceit; a device of ingenious vanity, covering the wearer with gross and unpardonable deceit. In like manner, a crusade has been waged against the skill of the dentist—against certain artificial "extents in aid" of symmetry effected by the milliner.

The other side argues, in favor of the wig, that, in the social intercourse of men, it is a laudable object for any individual to propose to himself, by making an agreeable appearance, to please, rather than repel his associates. On the simple ground that he would rather please than offend, an individual, not having the proper complement of hair and countenance, places a cunningly-fashioned wig upon his head, artificial teeth in his mouth, and an artificial nose upon his face. A certain money-lender, it is urged, acknowledged the elevating power of beauty when he drew a veil before the portrait of his favorite picture, that he might not see the semblance of a noble countenance, while he extorted his crushing interest from desperate customers. It is late in the age, say the pro-wig party, to be called upon to urge the refining power that dwells in the beautiful; and, on the other hand, the depression and the coarseness which often attend the constant contemplation of things unsightly. The consciousness of giving unpleasant sensa-

tions to spectators, haunts all people who are visibly disfigured. The bald man of five-and-twenty is an unpleasant object; because premature baldness is unnatural and ugly. Argue the question according to the strictest rules of formal logic, and you will arrive at nothing more than that the thing is undoubtedly unpleasant to behold, and that therefore some reason exists that should urge men to remove it, or hide it. Undoubtedly, a wig is a counterfeit of natural hair; but is it not a counterfeit worn in deference to the sense of the world, and with the view of presenting an agreeable, instead of a disagreeable object? Certainly. A pinch of philosophy is therefore sprinkled about a wig, and the wearer is not necessarily a coxcomb. As regards artificial teeth, stronger pleas—even than those which support wigs—may be entered. Digestion demands that food should be masticated. Shall, then, a toothless person be forced to live upon spoon-meat, because artificial ivories are denounced as sinful? These questions are fast coming to issue, for Science has so far come to the aid of human nature, that according to an enthusiastic professor, it will be difficult, in the course of another century, to tell how or where any man or woman is deficient. A millennium for Deformity is, it seems, not far distant. M. Boissonneau of Paris, constructs eyes with such extraordinary precision, that the artificial eye, we are told, is not distinguishable from the natural eye. The report of his pretensions will, it is to be feared, spread consternation among those who hold in abhorrence, and consider artificial teeth incompatible with Christianity; yet the fact must be honestly declared, that it is no longer safe for poets to write sonnets about the eyes of their mistresses, since those eyes may be M. Boissonneau's.

The old, rude, artificial eyes are simply oval shells, all made from one pattern, and differing only in size and in color. No pretension to artistic or scientific skill has been claimed by the artificial-eye manufacturer—he has made a certain number of deep blues, light blues, hazels, and others, according to the state of the eye-market. These rude shells were constructed mainly with the view of giving the wearer an almond-shaped eye, and with little regard to its matching the eye in sound and active service. Artificial eyes were not made to order; but the patient was left to pick out the eye he would prefer to wear, as he would pick out a glove. The manufacture was kept a profound mystery, and few medical men had access to its secrets. The manufacturers sold eyes by the gross, to retail-dealers, at a low price; and these supplied patients. Under this system, artificial eyes were only applicable in the very rare cases of atrophy of the globe; and the effect produced was even more repulsive than that of the diseased eye. The disease was hidden by an unnatural and repulsive expression, which it is difficult to describe. While one eye was gazing intently in your face, the other was fixed in another direction—immovable, the more hideous because at first you mis-

took it for a natural eye. A smile may over spread the face, animate the lip, and lighten up the natural eye; but there was the glass eye—fixed, lustreless, and dead. It had other disadvantages: it interfered with the lachrymal functions, and sometimes caused a tear to drop in the happiest moments.

The new artificial eye is nothing more than a plastic skullcap, set accurately upon the bulb of the diseased eye, so that it moves with the bulb as freely as the sound eye. The lids play freely over it; the lachrymal functions continue their healthy action; and the bulb is effectually protected from currents of cold air and particles of dust. But these effects can be gained only by modeling each artificial eye upon the particular bulb it is destined to cover; thus removing the manufacture of artificial eyes from the hands of clumsy mechanics, to the superintendence of the scientific artist. Every individual case, according to the condition of the bulb, requires an artificial eye of a different model from all previously made. In no two cases are the bulbs found in precisely the same condition; and, therefore, only the scientific workman, proceeding on well-grounded principles, can pretend to practice ocular prosthesis with success. The newly-invented shell is of metallic enamel, which may be fitted like an outer cuticle to the bulb—the cornea of which is destroyed—and restores to the patient his natural appearance. The invention, however, will, we fear, increase our skepticism. We shall begin to look in people's eyes, as we have been accustomed to examine a luxuriant head of hair, when it suddenly shoots upon a surface hitherto remarkable only for a very straggling crop. Yet, it would be well to abate the spirit of sarcasm with which wigs and artificial teeth have been treated. Undoubtedly, it is more pleasant to owe one's hair to nature than to Truefit; to be indebted to natural causes for pearly teeth; and to have sparkling eyes with light in them. Every man and woman would rather have an aquiline nose than the most playful pug; no one would exchange eyes agreeing to turn in one direction, for the pertest squint; or legs observing something approaching to a straight line, for undecided legs, with contradictory bends. Hence dumb-bells, shoulder-boards, gymnastic exercises, the consumption of sugar steeped in Eau-de-Cologne (a French recipe for imparting brightness to the eyes), ingenious padding, kalydors, odontos, Columbian balms, bandolines, and a thousand other ingenious devices. Devices with an object, surely—that object, the production of a pleasing *personnel*. It is a wise policy to remove from sight the calamities which horrify or sadden; and, as far as possible, to cultivate all that pleases from its beauty or its grace. Therefore, let us shake our friend with the cork-leg by the hand, and, acknowledging that the imitation is worn in deference to our senses, receive it as a veritable flesh-and-blood limb; let us accept the wig of our unfortunate young companion, as the hair which he has lost; let us shut our eyes to the gold work that fastens the brill-

iantly white teeth of a young lady, whose natural dentition has been replaced; and, above all, let us never show, by sign or word, that the appearance of our friend (who has suffered tortures, and lost the sight of one eye) is changed after the treatment invented by M. Boissonneau.

THE EXPECTANT.—A TALE OF LIFE.

WHEN a boy I was sent to school in a country village in one of the midland counties. Midvale lay on a gentle slope at the foot of a lofty hill, round which the turnpike-road wound scientifically to diminish the steepness of the declivity; and the London coach, as it smoked along the white road regularly at half-past four o'clock, with one wheel dragged, might be tracked for two good miles before it crossed the bridge over the brook below and disappeared from sight. We generally rushed out of the afternoon school as the twanging horn of the guard woke up our quiet one street; and a fortunate fellow I always thought was Griffith Maclean, our only day-boarder, who on such occasions would often chase the flying mail, and seizing the hand of the guard, an old servant of his uncle's, mount on the roof, and ride as far as he chose for the mere trouble of walking back again. Our school consisted of between twenty and thirty boys, under the care of a master who knew little and taught still less; for having three sermons to preach every Sunday, besides two on week-days, he had but little leisure to spare for the duties of the school; and the only usher he could afford to keep was a needy, hard-working lad, whose poverty and time-worn habiliments deprived him of any moral control over the boys. This state of things, coupled with the nervous and irascible temper of the pedagogue, naturally produced a good deal of delinquency, which was duly scored off on the backs of the offenders every morning before breakfast. Thus what we wanted in tuition was made up in flogging; and if the master was rarely in the school, he made amends for his absence by a vigorous use of his prerogative while he was there. Griffith Maclean, who was never present on these occasions, coming only at nine o'clock, was yet our common benefactor. One by one he had taken all our jackets to a cobbling tailor in the village, and got them for a trifling cost so well lined with old remnants of a kind of felt or serge, for the manufacture of which the place was famous, that we could afford to stand up without wincing, and even to laugh through our wry faces under the matutinal ceremony of caning. Further, Griffith was the sole means of communication with the shopkeepers, and bought our cakes, fruit, and playthings, when we had money to spend, and would generally contrive to convey a hunch of bread and cheese from home, to any starving victim who was condemned to fasting for his transgressions. In return for all this sympathy we could do no less than relieve Griffith, as far as possible, from the trouble and 'bother,' as he called it, of study. We worked his sums regularly for days beforehand, translated his Latin, and read over his les-

sons with our fingers as he stood up to repeat them before the master.

Griffith's mother was the daughter of a gentleman residing in the neighborhood of Midvale. Fifteen years ago she had eloped with a young Irish officer—an unprincipled fortune-hunter—who, finding himself mistaken in his venture, the offended father having refused any portion, had at first neglected and finally deserted his wife, who had returned home with Griffith, her only child, to seek a reconciliation with her parents. This had never been cordially granted. The old man had other children who had not disobeyed him, and to them, at his death, he bequeathed the bulk of his property, allotting to Griffith's mother only a life-interest in a small estate which brought her something less than a hundred pounds a year. But the family were wealthy, and the fond mother hoped, indeed fully expected, that they would make a gentlemanly provision for her only child. In this expectation Griffith was nurtured and bred; and being reminded every day that he was born a gentleman, grew up with the notion that application and labor of any sort were unbecoming the character he would have to sustain. He was a boy of average natural abilities, and with industry might have cultivated them to advantage: but industry was a plebeian virtue, which his silly mother altogether discountenanced, and withstood the attempts, not very vigorous, of the schoolmaster to enforce. Thus he was never punished, seldom reproved; and the fact that he was the sole individual so privileged in a school where both reproof and punishment were so plentiful, could not fail of impressing him with a great idea of his own importance. Schoolboys are fond of speculating on their future prospects, and of dilating on the fancied pleasures of manhood and independence, and the delights of some particular trade or profession upon which they have set their hearts; the farm, the forge, the loom, the counter, the press, the desk, have as eager partisans among the knucklers at *taw* as among older children; and while crouching round the dim spark of fire on a wet winter day, we were wont to chalk out for ourselves a future course of life when released from the drudgery, as we thought it, of school. Some declared for building, carpentering, farming, milling, or cattle-breeding; some were panting for life in the great city; some longed for the sea and travel to foreign countries; and some for a quiet life at home amid rural sports and the old family faces. Above all, Griffith Maclean towered in unapproachable greatness. "I shall be a gentleman," said he; "if I don't have a commission in the army—which I am not sure I should like, because it's a bore to be ordered off where you don't want to go—I shall have an official situation under government, with next to nothing to do but to see life and enjoy myself." Poor Griffith!

Time wore on. One fine morning I was packed, along with a couple of boxes, on the top of the London coach; and before forty-eight hours had elapsed, found myself bound apprentice to a