

smallest Venetian chain the value of the labour is not above thirty times that of the gold. The pendulum spring of a watch, which governs the vibrations of the balance costs at the retail price two-pence, and weighs fifteen one-hundredths of a grain, whilst the retail price of a pound of the best iron, the raw material out of which fifty thousand such springs are made, is exactly the sum of two-pence.

In France bar iron, made as it usually is with charcoal, costs three times the price of the cast iron out of which it is made; whilst in England, where it is usually made with coke, the cost is only twice the price of cast-iron.

**QUANTITY OF CIRCULATING BLOOD IN MAN.**—Each cavity of the heart may contain from two to three ounces of blood. The heart contracts four thousand times in one hour; therefore, there passes through the heart, every hour, eight thousand ounces, or seven hundred pounds of blood. The whole mass of blood in an adult man is about twenty-five or thirty pounds, so that a quantity of blood equal to the whole mass passes through the heart twenty-eight times in an hour, which is about once every two minutes.—What an affair must this be in very large animals! It has been said, and with truth, that the aorta of a whale is larger in the bore than the main-pipe of the water-works at London Bridge, and that the water roaring in its passage through the pipe is inferior in impetus and velocity to the blood gushing from a whale's heart. Dr. Hunter, in his account of the dissection of a whale, states that the aorta measured a foot in diameter, and that ten or fifteen gallons of blood are thrown out of the heart at a stroke with an immense velocity, through a tube of a foot diameter.

It has been well observed, that we cannot be sufficiently grateful that all our vital motions are involuntary, and independent of our care. We should have enough to do had we to keep our hearts beating, and our stomachs at work. Did these things depend, not to say upon our effort, but even upon our bidding, upon our care and attention, they would leave us leisure for nothing else. Constantly must we have been upon the watch, and constantly in fear: night and day our thoughts must have been devoted to this one object; for the cessation of the action, even for a few seconds, would be fatal; such a constitution would have been incompatible with repose.

The wisdom of the Creator, says a distinguished anatomist, is in nothing seen more gloriously than in the heart. And how well does it perform its office! An anatomist who understood its structure might say beforehand that it would play; but from the complexity of its mechanism, and the delicacy of many of its parts, he must be apprehensive that it would always be liable to derangement, and that it would soon work itself out. Yet does this wonderful machine go on, night and day, for eighty years together, at the rate of a hundred thousand strokes every twenty-four hours, having at every stroke a great resistance to overcome, and it continues this action for this length of time without disorder, and without weariness.

That it should continue this action for this length of time without disorder is wonderful; that it should be capable of continuing it without weariness is still more astonishing. Never, for a single moment night or day, does it intermit its labour, neither through our waking nor our sleeping hours. On it goes, without intermission, at the rate of a hundred thousand strokes every twenty-four hours; yet it never feels fatigued, it never seems exhausted. Rest would have been incompatible with its functions. While it slept the whole machinery must have stopped, and the animal inevitably perish. It was necessary that it should be made capable of working for ever without the cessation of a moment—without the least degree of weariness. It is so made; and the power of the Creator in so constructing it can in nothing be exceeded but his wisdom!

**FECUNDITY OF INSECTS AND FISHES.**—A single plant-louse may be the living progenitor of 5,904,900,000 descendants, and the queen of the warrior white ants produces 31,536,000 eggs in one year. Compared with the rest of animated nature, infusion animalculæ are the most numerous; next are worms, insects, or fishes; amphibia and serpents, birds, quadrupeds; and last is man. How prodigious is the difference between fishes, amphibia, reptiles, insects, and worms. A scorpion will produce 65 young; a common fly produce 144 eggs; a leech 150; and a spider 170. A female moth will produce 1,100. A gall insect has laid 5,000 eggs; a shrimp 6,000; and 10,000 have been found in an ascadide. Twelve thousand eggs have been found in a lobster, and in another above 21,000. An insect very like an ant, has produced 80,000 in a single day; and Leuwenhoeek computes four millions in a crab. Above 26,000 eggs have been counted in a herring; 38,000 in a smelt; 1,000,000 in a sole; 1,130,000 in a roach; 3,000,000 in a species of sturgeon; 342,000 in a carp; 383,000 in a perch; 546,000 in a mackerel; 992,000 in a perch; and

1,357,000 in a flounder. The cod, however, has been computed to produce more than 3,686,000 eggs; another 9,000,000; and a third 9,444,000. Here, then, are eleven fishes, which probably, in the course of one season, will produce above thirteen millions of eggs!—*Library of Entertaining Knowledge.*

SACRED PSALMODY.

The effect produced by the words, or by the music, or by the combination of the two is such, that the cultivation of psalmody has ever been earnestly recommended by those who are anxious to excite true piety. Tradition, history, revelation, and experience, bear witness to the truth that there is nothing to which the natural feelings of man respond more readily. Every nation, whose literary remains have come down to us, appears to have consecrated the first efforts of its muse to religion, or rather all the first compositions in verse seem to have grown out of devotional effusions. We know that the book of Job, and others, the most ancient of the Old Testament, contain rhymical addresses to the Supreme Being. Many of the psalms were composed centuries before the time of king David, and it is not extravagant to imagine, that some of them may have been sung to Jubal's lyre, and were handed down from patriarch to patriarch by oral tradition. Nor did the fancy of Milton take too bold a flight when it pleased itself with the idea that our first parents, taught by the carols of the birds in the garden of Eden, raised their voice in tuneful notes of praise to the Creator of all when they walked forth in the cool of the day to meet their God before the fall. But this is certain, that one of our Lord's last acts of social worship on earth, was to sing a hymn with his disciples. Few, therefore, can be slow to understand, that if Christ and his disciples broke forth in holy song, immediately after the solemnities of the Last Supper, and just before the Shepherd was smitten, and the sheep were scattered; and if Paul and Silas sung praises unto God in their prison-house, congregational worship may always be the better for such helps.—Add to these examples, the apostolical exhortations to the merry hearted, to sing psalms, and the apostolical descriptions of the choral strains which resound in the courts of heaven, and we cannot but feel certain, that the services of the Christian church were cheered from the earliest times by hymns and psalms. Those Nazarene singing hymns to Christ," said Phiny in contempt. We thank him for recording the fact. The words of the Te Deum were composed by a native of Gaul, (for the use probably of one of the churches of the Rhone, or of the Alps) about the third century; and at the same period, men, women, youths of both sexes, and even children joined in the psalmody of the sanctuary, in such cordial and harmonious unison, that a father of the church has well compared the sound to the loud, but not discordant noise of many waves beating against the sea-shore.

At the time of the Reformation, sacred music, which had begun to run wild, was brought back to its first principles. The melodies of religious worship were rendered more heart-touching, by being set to words in the vernacular tongue, which every body could understand. Luther's hymn, "Great God what do I hear and see," led the way. Henry VIII. hated the German Reformer, and all that he did, but he burned to rival him in every thing, and he gave a stimulus to the public taste, by composing words and music for the service of the English church. In France, soon after the middle of the sixteenth century, when it was doubtful whether the nation would become Protestant or remain Roman Catholic, the pathetic tunes and devotional stanzas of the reformers obtained so great an influence on the minds of men, that the music of the temples, as the Protestant sanctuaries were called, to distinguish them from the Roman Catholic churches, became the fashionable melodies of the day. This taste found its way even to the court, and to the great alarm of the Romish party, some of the sweetest and most stirring of the psalms, which had been translated into French metre by Clement Marot, were set to music by Lewis Guadimel, and were constantly in the mouths not only of the Protestant families of the provinces, but of the ornaments of the saloons of Paris, and of the palace of the Louvre. It is said to have been quite astonishing how much this pious and simple device found favour for the Protestant cause and induced people who had never read Scripture before, to search the holy volume out of which those treasures were drawn, which so charmed their ears and their imagination. It is still the practice in most of the mountain churches, to make sacred music a part of family devotion, and many of the tunes which Guadimel composed with such success, are still sung to the praise of God. I can bear witness, to the forcible manner in which these strains, rising from heaven from the lips of parents, children and domestics, quicken piety, and stir up the best affections of the heart towards God and man. I have seen and felt the effect

produced by them in the humble dwelling of the village pastor, where none but human voices swelled the notes; and in the chateau where the harp and the organ have mingled their fine sounds with the well modulated tones of an accomplished family of sons and daughters. My thoughts, at the moment I am writing this, are at Chateau Blonay, but most of the voices which I heard there, are now silent in death! I am thoroughly convinced that family worship, and congregational worship lose a great auxiliary to piety, when there is not the power or the inclination to join in psalmody.

ADVANTAGES AND DISADVANTAGES OF EMIGRATION TO BRITISH AMERICA.

One of the disadvantages of emigration is the separation of friends for ever. Time and distance no doubt gradually obliterate from our minds the most endearing recollections; but under untoward circumstances, which will at times cross the path of every mortal in the most favourable situations, the emigrant's, and particularly the female emigrant's breast must be "stung with the thoughts of home," on comparing the many conveniences and comforts, and society, which they enjoy in their fatherland, and which cannot be within their reach in their newly adopted country for many years to come, and perhaps not within the period of their lives. Unavailing wishes that they were back to their own country have been expressed by many, who looked with dread on the hardships they had to encounter at their first settlement. The labour required to clear a forest of gigantic trees is appalling to a man who has nothing to depend upon but the physical strength of his own body; and if its powers have been impaired by low living, arising from a want of employment previous to the period of his emigration, and if he have a wife and large family depending on him for support, that labour must be exercised at the outset to a painful degree. All the shelter he can expect in the first winter of his sojourn in a house of trees piled together, and his wooden furniture must consist of the rudest construction blocked out of the timber which he himself has cut down. Though the air is clear and bracing, the intensity of the cold in winter is far beyond what he can conceive, and the heat in summer is so great for a short period as to blister the skin, if left exposed to the influence of the sun's rays. The diversity of temperature in the seasons causes an additional expense in the provision of clothes for the winter. Mosquitoes swarm on every new settlement, and annoy every one by their stinging and raising inflamed spots over the body. Rubbing strong vinegar over the parts, is said to alleviate the pain. Fires of wet chips, lighted at the doors of the cabins, will prevent the ingress of these troublesome insects. When a clearance has been made the mosquitoes are not so troublesome. They dwell chiefly in the woods, and in the vicinity of swamps, and come out in hot weather. A small black fly annoys also very much, by settling among the hair in the morning and evening. Sleep is completely driven away when they make an attack, and they produce the most uneasy sensation.

The state of the roads prevents a constant or rapid communication between places; and in a new country, where coin, as the circulating medium is scarce, and barter exists as the medium of exchange, difficulties are often encountered in disposing of the overplus stock of agricultural produce. The intrusion of wild animals is an evil which ought not to be overlooked as affecting a new settler. If the cattle and sheep are not penned up at night, they may be partly destroyed by the ferocity of the bears. Bears however, are not numerous. But squirrels and racoons, of which there are plenty, may destroy the corn crops considerably, particularly in any season that is unfavourable to the formation of beech masts and nuts.—Mice and rats eat the seed of the Indian corn after it is in the ground, so that two or three successive sowings are sometimes required.

The advantages on the other hand, which emigrants may enjoy in our American colonies are numerous and important. The first and great advantage is constant employment, whether labour be required for the improvement of their own land, or that of an employer. Constant employment bestows vigour on the bodily frame, and contentment to the mind. Labour, it is true, is not so high priced in Canada as it was when laborers were scarcer, but still an able bodied agricultural labourer can get 2s. 9d. a day and skilful mechanics as much as 5s. and their victuals. The soil being quite new and fresh, it is naturally fertile, and it will give a good return for the labour bestowed upon it, and of course, the exercise of superior skill and industry, will produce extraordinary results. The climate in summer too, being so very superior to this country, that many products of the soil may be obtained there with little trouble, which cost much trouble and expense here. Not only the ordinary grains can be grown to perfection, but maize, garden vegetable productions, and fruits of all kinds grow luxuriantly. It is found, however, that the grafted trees

from this county thrive much better, and produce more and better fruits, than the natural trees of the country. Abundance of provisions then, for the largest families may be always obtained in our American Colonies during the whole year. This assurance of abundance not only produces contentment of mind, but endues that spirit of independence which forms a valuable ingredient in a manly character. All accounts agree in the happy and contented state in which the emigrants are found, even in the midst of toil. Ample future provision for the family soothes the mind of the emigrant even in the hour of dissolution. Not a trifling advantage consists in the absence of all vexatious imposts or burdens. There are no stamp-duties. Taxes there must be in all civilized communities, but there, they are "trifles light as air." One dollar per hundred acres of land is about the annual amount of taxation to an emigrant. Besides all that, he may make his own malt, brew his own beer, make his own candles and sugar, raise his tobacco, and tan his own leather, without dread of being exchequered. At last, though not least, of these advantages, is the most unlimited space which lies open for settlements. For many generations yet unborn, good land and constant employment will await the arrival of the emigrant in the forest lands of our American Colonies. These advantages counteract the evils of a new country, but combining the former with the latter, emigrants should check the ardour of enthusiasm. They must consider that perseverance alone will insure success. They must make up their mind to work ere they can prosper. If they wish to possess land of their own they must take money with them to give in exchange for that land.—Having obtained the land which they desired to possess, they must consent to endure hardships before they can obtain even a shelter, and they must wait with patience the returning season before they can reap the fruits of their industry. All these considerations cannot be too strongly urged on the mind of the emigrant, for if they are not expected and guarded against, disappointment and vexation will assuredly ensue. "It is a matter of the first importance," says Mr M'Gregor, "for a man living in the United Kingdom, to consider, before he determines on expatriation, whether he can by industry and integrity obtain a tolerably comfortable livelihood in the country of his nativity; whether in order to secure to his family the certain means of subsistence, he can willingly part with his friends, and leave scenes that must have been dear to his heart from childhood; and whether in order to attain to independence, he can reconcile himself to suffer the inconvenience of a sea voyage, and the fatigue of removing with his family from the port where he disembarks in America to the spot of ground in the forest on which he may fix for the theatre of his future operations; whether he can reconcile himself for two or three years to endure many privations to which he had hitherto been unaccustomed, and to the hard labour of levelling and burning the forest, and raising crops from a soil with natural obstructions, which require much industry to remove. If after making up his mind to all these considerations, he resolves on emigrating he will not be disappointed in realizing in America any reasonable prospect he may have entertained in Europe. These difficulties are indeed such as would often stagger the resolution of most emigrants, if they had not before them, in every part of America, examples of men who must have encountered and have overcome equally if not more disheartening hardships, before they attained a state of comfortable affluence.

ON EMIGRATION.

By the Rt. Hon. R. W. Horton, M. P.

The principle of emigration is as clearly laid down in the 13th chapter of the Book of Genesis, as in the history of Greece and Rome, were it was resorted to as an expedient, self-evident, safe, and successful, whenever a practical inconvenience arose from too crowded a population. In the 13th chapter of Genesis it is stated, that "Abram went up out of Egypt, he and his wife, and all that he had, and Lot with him, into the South. And Abram was very rich in cattle, in silver, and in gold. \* \* \* And Lot also, which went with Abram had flocks, and herds, and tents. And the land was not able to bear them, that they might dwell together: for their substance was great, so that they could not dwell together. And there was a strife between the herdsmen of Abram's cattle, and the herdsmen of Lot's cattle. And the Canaanite and the Perizzite dwelled then in the land. And Abram said unto Lot, let there be no strife, I pray thee, between me and thee, and between my herdsmen and thy herdsmen: for we be brethren. Is not the whole land before thee? Separate thyself, I pray thee, from me. If thou wilt take the left-hand, then I will go to the right; or if thou depart to the right-hand, then I will go to the left. And Lot lifted up his eyes, and he beheld all the plain of Jordan, that it was well watered everywhere, before the Lord destroyed Sodom and Gomorrah, even as the garden of the Lord, like the land of Egypt, as thou