

in the first, five in the second, and three in the third brood, making fourteen per annum from a single pair. Supposing a couple to live in health and enjoy the comforts necessary for the bringing up of their young families, for a period of only ten years, which is a moderate estimate for birds of this class, you will readily conceive that a whole flock of sparrows may in a very short time be produced by them."

This bird, although it leaves the nest clean and perfect after the first brood, does not rear a second in the same domicile, but constructs a new one. It is made of fine grass, and nicely lined with hair, principally horse hair. Both birds assist in the process of incubation, and while one is in the nest, the other affectionately brings it food. While the female is sitting, the male sings to her from some neighbouring twig or fence rail. The flight of the song sparrow is short, and much undulated when the bird is high in the air, but swifter and more level when it is near the ground. They migrate by night, singly or in scattered troops. They feed on grass seeds, berries, insects, especially grass-hoppers, and now and then pursue flies on the wing. On the ground their motions are lively. They continue running about with great nimbleness and activity, and sometimes cross shallow waters leg deep. They often frequent orchards and gardens, where they love to breed if a secure corner can be found.

This bird sings the whole summer long, and until it takes its departure in the autumn. The notes of chant are short, but very sweet, resembling the beginning of the canary's song, and frequently repeated, generally from the branches of a bush or a small tree, where it sits chanting for an hour together.

The song sparrow is usually called in Upper Canada the "grass bird" or "grey bird," a name that is also applied to another little fellow, who is frequently found building upon a tree close to the walls of some inhabited house. This, however, is the "chipping sparrow," a bird which, although it belongs to the family, has its place in another genus. It is the *Emberiza socialis* of Swainson, and may be recognised by its song "sip-sip-sip-sip," resembling as Audubon says, "the sounds produced by smartly striking two pebbles together, each succeeding note rising in strength, although the song altogether is scarcely louder than the chirping of a cricket."

Of the genus to which the song sparrow belongs, four species only, visit Canada, and of these *Fringilla melodia* is the most common.—*Canadian Naturalist and Geologist*.

A DESPERATE CONFLICT BETWEEN A LION AND AN ANTELOPE.—Dr. Livingstone gives a very interesting description of a fight he witnessed in Africa between a lion and an antelope. The Dr. and his guides had just emerged from a narrow defile between two rocky hills, when they heard an angry growl, which they knew to be that of the "monarch of the forest." At the distance of not more than forty yards in advance of them, a gemsbok stood at bay, while a huge tawny lion was crouched on a rocky platform, above the level of the plain, evidently meditating an attack on the antelope; only a space of about twenty feet separated the two animals. The lion appeared to be animated with the greatest fury,—the gemsbok was apparently calm and resolute,—presenting his well fortified head to the enemy. The lion cautiously changed his position, descended to the plain and made a circuit, obviously for the purpose of attacking the gemsbok in the rear, but the latter was on the alert and still turned his head towards his antagonist.

This maneuvering lasted about half an hour, when it appeared to the observers that the gemsbok used a stratagem to induce the lion to make his assault. The flank of the antelope was for a moment turned to his fierce assailant. As quick as lightning the lion made a spring, but while he was yet in the air, the gemsbok turned his head bending his neck so as to present one of his spear-like horns at the lion's breast.

A terrible laceration was the consequence; the lion fell back on his haunches, showing a ghastly wound in the lower part of his neck. He uttered a howl of rage and anguish, and backed off to the distance of fifty yards, seeming half disposed to give up the contest, but hunger, fury or revenge once more impelled him forward. His second assault was more furious and headlong; he rushed at the gemsbok, and attempted to leap over the formidable horns in order to alight on his back.

The gemsbok, still standing on the defensive elevated his head, speared the lion in the side, and inflicted what the inspectors believed to be a mortal wound, as the horns penetrated to the depth of six or eight inches. Again the lion retreated groaning and limping in a manner that showed that he had been severely hurt, but he soon collected all his energies for another attack. At the instant of collision, the gemsbok presented a horn so as to strike the lion immediately between his two fore legs, and so forcible was the

stroke that the whole length of the horn was buried in the lion's body. For nearly a minute, the two beasts stood motionless; then the gemsbok, slowly backing, withdrew his horn and the lion tottered and fell on his side, his limbs quivering in the agonies of death. The victor made a triumphant flourish of his heels, and trotted off apparently without having received the least injury in the conflict.—*Dr. Livingstone's travels in Africa, an Unpublished Work.*—*Michigan Journal of Education*.

GREAT RESULTS FROM LITTLE CAUSES.

That Brahmin, who, according to the command, laid upon him by his religion and his caste, never tasted the flesh of an animal, but repulsed all food of that kind with horror, was not a little shocked when an Englishman showed him, by means of a microscope, in every drop of the water, of which the Brahmin had just drank, a countless host of little animals, made visible by an artificial eye of ground glass. He was all but ready to choose death from thirst rather than bring death upon thousands of living creatures at every draught. But the Englishman who had so terrified him, suggested the consolation that such infinitely small creatures as we take in with every drop of water, and even with every breath, pass through the operation uninjured.

The animal world, revealed by the microscope, an instrument which at first merely afforded amusement to the eye, has in later times become a subject of attentive consideration, not only to the natural historian, but also in the enquirer into the history of the formation of the earth's surface, and of the permanency of the relations subsisting between the atmosphere and the external condition of the globe. It is found by the microscope that huge beds of the silicious earths, which make so large a part of the earth, are composed of a heap firmly baked together of innumerable shells, in which infinitely small animals once dwelt, for in these atomlike animalcules, a perfection and delicacy of structure, a beauty and proportionate strength of outward form and defence are apparent, which fill the observer with the deepest wonder. At the period when these silicious beds were formed, living beings must have stirred in every drop of the fluid element.

The attention of the natural historian has been drawn in recent times in yet another way to these minute animals, and to their importance to the economy of material nature. We spoke in the former chapter of the consumption of the oxygen of the atmosphere by animals, by fire, by manifold processes of fermentation and oxydation. There is developed, it is true, from the living vegetable world, by the decomposition of carbonic acid, under the influence of the sun's light, a considerable quantity of oxygen gas, but another, and perhaps not less abundant source of supply is in the animal world itself, and in the department of microscope animals. We will dwell on this fact for a moment.

Several years ago, a celebrated inquirer, Count Rumford, observed, that from various unorganised bodies, such as silk, woolen and the like, when exposed in a vessel filled with water to the light of the sun, a quantity of the purest oxygen gas was developed. At the same time the water took a green color, which, as appeared by the microscope, proceeded from a countless multitude of little round shaped animals. In the pans used in salt works is seen a slimy transparent mass forming, which covers the bottom to the depth of one or two inches, and on the surface of which large air bubbles rise. When the slimy skin-like substance of these bubbles is broken with a stick, there issues forth an air, which upon full experiment is ascertained to be oxygen gas, perfectly pure. But when still further the thick sticky fluid, from which the gas proceeds, is examined by the microscope, it is discovered to consist almost entirely of a mass of just such living animalcules as those of the shells of which the hill *Kieselguhr*, at Franzenbnd, in Bohemia, and other similar : ata our mountain regions are composed. Even in the white ashes, which remain after exposing the thick fluid mass to the fire, we may distinguish the silicious skeletons of the animalcula of which it is composed. These skeletons show so distinctly the form of the animals to which they belonged, that it appears as if one were still looking at the fresh slime which they fill, but only in a dead, motionless state. Other waters also which contain organic substances are, according to various repeated experiments of a recent date, animated with thick heaps of little red and green animals, visible only through the microscope; and a species of air comes from the water, in which, when it is collected under a glass, a burning shaving gives forth a clear flame as in oxygen gas, and by this and other signs it is proved to be pure, or almost wholly pure, oxygen.

When we consider, in this connection, the extensive pools upon shallow sea coasts, filled with saline particles, mixed with a mass of the organised remains of sea animals, when we remember still further the numberless collections of standing water in swamps and ditches, with which also the remains of animal and vegetable bodies are mingled, it will be easy to see the important office which these animalcules discharge in the material world. They consume without ceasing the substances held in solution, which, if they decayed in the ordinary manner, would poison the air with the exhalation of their corruption. And although these animalcules cannot entirely remove the evil in swampy regions, yet their services in this respect are by no means inconsiderable. But not only is this work of purification and clearing away, committed to these animated atoms, they perform the much more important office of separating the oxygen in entire purity from the water in which it is contained. Here the weakest and smallest are appointed to supply that which is essential to the life and activity of the strongest. What, to our ordinary view, seems contempt-