

are at liberty to fly also, but few, however, take such liberty; when they do they head to the hive as if in the open air, and after a short fly they dart to the window, where, of course, they die.

It will be said that the cellar is cold or the bees would not keep so still. The temperature has averaged up to date (Jan. 17), 45° or more; only once has it touched 40°, and then only for a few hours; while most of the time it has shown 50°.

It is not a matter of convenience that these bees are placed as they are. They have been so placed, because I believed daylight essential to the welfare of the bees. Next May, when the clover blooms, I shall know how well my belief was founded. Should it prove well founded, a valuable experiment will have been made public; as it will then be reasonable to keep a few bees in an ordinary cellar. It is very pleasant to be able to see how the bees are doing, without the aid of a lamp.

To the bee-keeper having a fertile imagination a long list of desirable features can be made possible in the "light" of the light cellar, as well as in the light of these experiments.

In this article no effort has been made to show that perhaps five months in a dungeon may be as detrimental to bees as to human beings; neither that the absence of light for so long a period may or may not be as detrimental to bees in a cellar as a much greater degree of cold in the sunlight. Neither has it been the part of this article to prove that spring dwindling, diarrhoea, etc., would not have taken place had the bees affected with it been wintered in a light cellar instead of a dark one.

One point remains not yet clearly stated, viz.: that it is not light that causes bees in a cellar to be uneasy. If, then, that is not the cause, of what value is it to surround them in impenetrable darkness? We have all seen bees slowly withdraw from activity to repose, as one by one the plants ceased to yield honey and pollen; and when no incentive to industry longer existed, how unbroken became their repose. Is there any evidence that darkness played any important part in such quiet? Were the bees more at rest in the night than in the sunlight?

The fact that bees do winter just as well under apparently much less favorable conditions in the open air, is, to say the least, a point in favor of the vitalizing influence of fresh air and sunshine!

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From The Independent.

How Naturalists Classify Honey Bees.

THE number of distinct living animal forms is very great. Of fishes, reptiles, birds and mammals, there are supposed to be not less than 20,000 different species now living, and many thousands that once lived have long since become extinct. The animals above named are all comparatively large and well known, but when we come to study the smaller and more obscure members of the great animal kingdom, we find that the numbers are prodigious and beyond computation. Of one single order of insects, the Coleoptera, there are esti-

mated to be in the museums of the world, not less than 100,000 species, and the total number of different species of insects is thought to be not less than half a million. Hence, it will readily be perceived that no idea of the place of any animal in this vast collection, could be obtained, except through the use of some system of classification. Through some such system, let us examine the place of the honey-bee in the animated creation.

The father of zoology, Aristotle, 300 years B.C., divided all animals into two great groups—the anima, or colorless blooded, and the enima, or red blooded. The groups correspond to our invertebrates and vertebrates. The former group includes all animals which possess no back-bone, as insects, worms, mollusks, (shell-fish), and that vast array of minute and often nearly structureless forms of life, popularly denominated "animalcules" but known to naturalists under the name of Protozoa in the first forms of life, the lowest members of the animal kingdom. The vertebrates possess a back-bone, and include all fish, reptiles, birds and mammals. The invertebrates are far more numerous than the vertebrates. *Bees are invertebrates.*

The French naturalist Cuvier, who lived in the time of the first Napoleon, divided the invertebrates into three great divisions or branches, called sub-kingdoms, viz., Mollusca, Articulata, and Radiata. To these later naturalists have added a fourth division, the Protozoa. The Mollusca include all forms of animals popularly called "shell-fish," as clams, oysters, mussels, conchs, snails, pectins, razor shells, and also the not apparently (to the untrained eye) related forms of cuttle-fish, squids, calamaries, etc. This group, though now very large, was in former ages of the world, much greater than at present. The Radiata comprises a vast multitude of animals, mostly marine, whose bodies are more or less built on a radiate plan, as is well illustrated in the familiar star-fish. Here, also, belong the curious sea-urchins, or sea eggs, the erinoids, the stone lilies of ocean's depths, the corals, the jelly-fish, and many other strange and interesting forms. The Protozoa, as above mentioned, include all the "animalcules." Many of these are so minute that they can only be seen through the aid of a powerful microscope. And it is wonderful to relate that while some of these are quite highly organised, there are others which so much resemble plants that by certain scientists they are viewed as connecting links between the plant and the animal kingdoms. Professor Orton tells us that some of these forms at one period of their lives we would affirm to be plants, but at a later period as certainly call animals.

The articulata include all animals whose bodies are made up of rings or segments jointed together in a linear series, and whose legs are jointed at the place of union with the body, as is seen in lobsters, crabs, spiders, and in all kinds of insects. Cuvier included here worms also, but these later naturalists have seen proper to place in a sub-kingdom by themselves. *Bees are articulates.* The Articulates are readily divided into two great sections, viz., the Crustaceans and the Insecteans. The former are those articulates which have a hard shell or crust on the outside of the body, seen well in the lobster, crab, cray-fish, shrimp, and in the wood-louse.