

tial results," when he says "the truest interest of the enlarged propagation of fish, and the immense increase of food which we anticipate from artificial methods and their auxiliaries, that we should now begin to consider seriously the economic as the chief of 'practical results.'"

Fish hatching commenced in Canada about fifteen years ago; now there are eleven government fish hatcheries, eight of which are occupied in developing salmon *only*; two are employed in hatching salmon, white fish and trout eggs, and one hatches whitfish and pike-perch, and the entire cost of these public establishments to date is \$259,100. We will look further into this matter in a future issue, but in the meantime it is evident that Mr. Whiteher has given a clear statistical statement showing that we have been wasting money without reaping the fruits.

PROTECTION FROM INSECT ATTACK.

Mr. J. A. Lintner, the New York State Entomologist has sent us a pamphlet wherein he propounds a new principle in protection from insect attack. He says "it will be readily conceded that the use of preventives, whenever practicable, is more economical, more effective, and often more convenient than a resort to remedies." His object is to prevent insects from depositing their eggs on their food plants, and he says it can be and has been done with perfect success in many instances. By applying to the plant or to the soil certain odorous substances which are disagreeable to the insect, and therefore to drive it away; contending that the larger proportion of the insect world are guided in their natural habits by the sense of *smell*. The popular idea that many insects attacking vegetation select their food plants whereon to deposit their eggs by the sense of sight is evidently erroneous, and not in accordance with his investigations. He has watched "the incomprehensible acuteness shown by an insect in the discovery

of the particular species of plant upon which alone the young caterpillars could feed, in the discovery of a single individual of a rare species occurring in a certain locality, and growing in such a manner as effectually to hide it from human observation. When its range of food plants extends beyond a species to all the members of a genus, how could it detect all of the greatly differing forms? When a still broader range embraces the several genera of an extended order, a still greater variety of form are presented, which the rude insect brain must group and classify, and claim within its province. How amazing such knowledge without previous instruction. It had no parents living as in the class of Vertebrates, which might teach it by example. It had no ancestors a whit wiser than itself from which to learn. The deposit of the egg in its place may have been but the second voluntary act in its imago life, regarding that of flight for the purpose as the first. Perhaps a plant from some distant shore, of which not one of its ancestry could have any knowledge, is brought within its range of wing; its flight is unhesitatingly directed to it, and its precious burden of eggs, without a shadow of mistrust, is at once committed to its leaves. Such knowledge has never been attained by our most distinguished botanists, and it is beyond the scope of human intellect. We have called its displays instinct, a word conveniently framed to cover manifestations in other classes of animated beings which we are utterly unable to explain. As a partial explanation of these wonders, it has been suggested that to the insect world may have been given senses differing in number and in kind from those that we possess. But all the wonderful phenomena attendant upon insect oviposition by selection, is readily explained under the supposition that it is guided and controlled by the sense of smell, and notwithstanding the laborious investigations in insect structure, conducted through a century by some of our most distinguished scientists, we are utterly