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APOLOGY.

WE really must apologise for the scant amount of reading matter in this issue. Pressure of advertisements and the index for the year occupy nearly all the space. Next week we shall not be so crowded and will make amends.

FOR THE CANADIAN BEE JOURNAL.
SCIENCE AND APICULTURE.

WHERE has been considerable discussion of late in the C. B. J. on the above subject and I would not take a hand in were it not that I am called upon to do so by Mr. Cushman in the last issue of JOURNAL.

The physiological question in dispute, viz:—How is animal heat produced in the living system, though not directly connected with apiculture science is nevertheless a very important one, inasmuch as upon its true solution depends to a great extent not only the regulation of the winter stores for our bees but the regulation of our own diet which is of much more importance. "Apicultural science," did I say? Brother Pond, of Foxboro, gravely tells us in a late issue of the JOURNAL that we have no science of apiculture. He endeavors to prove this in part by averring that "we to-day are little if any in advance of the bee-keepers of the days of Virgil," and that "as a matter of fact we are all at sea in regard to wintering, and no one has any advantage over the others," that in truth, "all are alike groping in the dark." Surely our Massachusetts friend was either "nodding" (and "even Homer nods") or else slightly bilious when he was led to take such a gloomy and pessimistic view of modern bee culture! Well, we are all more or less subject to these mentally gloomy spells, when the whole universe looks dark. I don't know, of course, how it is with Mr. Pond and the rest of our bee cousins across the lake, but we "Canucks" back here in this "frozen region of howling wilderness" are certainly not "all at sea in regard to wintering," as the sea is already so well frozen over that we can glide along over it with considerable safety. Nor are we "all alike groping in the dark" over this sea of ice (slippery I admit) and liable to run at any moment into the air

holes. I have the presumption to think that a pretty considerable number of us have lanterns very well trimmed—lanterns giving out the light of apicultural knowledge, accumulated through long years of experience, patient observation, and persistent study.

That we have no science of bee culture I cannot for one moment admit. The science, it is true, is not yet, by any means, mature and what science is? Outside of mathematics all the sciences are growing towards maturity—and rapidly too under the nourishing heat and swelling light of this marvelous age. If we are to call every imperfect science no science at all, all outside of the exact sciences may be ruled out. Physiology, for instance, must go, and we have an illustration of this in the very matter we are now approaching, for this brings us to the subject in hand as between Prof. Cook, Mr. Cushman and others. The problem in dispute is a physiological one, and as yet an unsettled one—an open question. And here is where Prof. Cook and Mr. Cushman are both, I respectfully submit, in error. Each assumes the solution he urges to be the true one, and this presupposes on the part of each that the question in issue is definitely settled, which it is not. This method would simply issue in a balancing of authorities, and this is certainly not the scientific method. Instead of setting up a theory and then hunting up facts to fit it and authorities to sanction it the true investigator hunts up all the facts and then casts about for a generalization or theory that will fit them all. The one is *a priori*, the other *a posteriori* in its methods.

Liebig was a distinguished chemist, and in his great work, "Organic Chemistry," he propounded the theory that the animal heat of the living system is produced by the combustion in the lungs of the oxygen derived from the inspired air and the carbon derived from the food. The hypothesis soon became popular in scientific circles. It has however from time to time been challenged and controverted, especially by the Hygienic philosophers and the Hygieo-therapeutic school of physicians. Prof. Trall, the founder of, and most eminent authority in, that school very ably controverts Liebig's theory in his encyclopædia and elsewhere. That Trall was a profound thinker and original investigator is certain; but he unfortunately died before his great work "Principles of Hygienic Medication" was completed. In Medical Science he made new and valuable discoveries, solving problems which had baffled the profession for ages. His explanation of animal heat is that it results naturally from the motions of life—from the vital processes, without the necessity of a chemical stove in the lungs. In