

# BREAD REFORM

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LETTER FROM DR. J. H. GILBERT, F.R.S., TO THE

SECRETARY OF THE SOCIETY OF ARTS.

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Adams Case

W.H. Gibb

Dr. J. H. Gilbert, F.R.S., writes to the Secretary of the Society regretting his inability, on account of pressure of other work, to read a paper at the Society of Arts during this present Session, and goes on to say, "If I had any spare time for such a purpose, I should be disposed to discuss the important food question of the so-called bread reform. Many years ago Mr. Lawes and myself went somewhat fully into some of the points involved (*Journal of the Chemical Society*, vol. x., 1857). We showed the distribution of the nitrogen, the total mineral matter, the phosphoric acid, &c., in the different mill products from wheat grain. It is true that about three-fourths only of the total nitrogen of the grain are found in ordinary bread-flour, the remaining one-fourth or so being retained in the usually excluded portions, which latter are richer in nitrogen than the flour. But it has long been known that a considerable part of the nitrogenous matters of the excluded portions is not in the same condition as those in the flour; and it is stated that they are in an inferior degree digestible and available. Recent investigations show that only from two-thirds to three-fourths exist in the albuminoid condition; and it is as yet not settled whether, or in what degree, the non-albuminoid nitrogenous bodies are of nutritive value. So far as they are not, the value of the excluded portions will be proportionately reduced (so far as this is dependent on the nitrogenous compounds), and it may be even lower instead of higher, for a given weight, than in the flour. Of the phosphoric acid of the grain, it may be said that not more than about one-third will be found in the bread-flour. And, although I am not aware that the point has been proved, it may be that the flour is in a greater degree deficient in a due proportion of phosphoric acid than of nutritive nitrogenous compounds; and, if this be the case, it is a question whether it would not be better to add phosphoric acid in the process of bread-making (as is sometimes done in America), than to include the whole of the more phosphatic portions of the grain. For, if these were supplied in a coarsely-ground state, there would be waste of food by its passage through the body unused; and, if so finely ground as to avoid the aperient action, it is a question whether evil would not then arise from the excess of earthy (and especially magnesium) phosphate, causing accumulation and constipation. Indeed, notwithstanding the exclusion of so much of the nitrogen and phosphoric acid of the grain from ordinary bread-flour, we nevertheless came to the conclusion that such flour was better food than whole-meal bread, for the reasons that the nitrogenous matters of the excluded portions were of lower nutritive value; that those portions contained a considerable amount of indigestible woody matter; and that the branny particles so increased the peristaltic action as to cause the passage from the body of a large amount of the food unused. In reference to the points which are now again brought so prominently forward, we said, in the paper above referred to (pp. 33, 34):—"The higher per-centage of nitrogen in bran than in fine flour has frequently led to the recommendation of the coarser breads as more nutritious than the finer. We have already seen that the more branny portions of the grain also contain a much larger per-centage of

mineral matter. . . . It is, however, we think, very questionable whether, upon such data alone, a valid opinion can be formed of the comparative values, as food, of bread made from the finer or coarser flours from one and the same grain. . . . Again, it is an indisputable fact that branny particles, when admitted into the flour in the degree of imperfect division in which our ordinary milling processes leave them, very considerably increase the peristaltic action, and hence the alimentary canal is cleared much more rapidly of its contents. It is also well known that the poorer classes almost invariably prefer the whiter bread; and among some of them who work the hardest, and who, consequently, would soonest appreciate a difference in nutritive quality (navvies for example) it is distinctly stated that their preference for the whiter bread is founded on the fact that the browner passes through them too rapidly, consequently before their systems have extracted from it as much nutritious matter as it ought to yield them. It is freely granted that much useful nutritious matter is, in the first instance, lost as human food, in the abandonment of 15 to 20 per cent. of our wheat-grain to the lower animals. It should be remembered, however, that the amount of food so applied is by no means entirely wasted. And further, we think it more than doubtful, even admitting that an increased proportion of mineral and nitrogenous constituents would be an advantage, whether, unless the branny particles could be either excluded, or so reduced as to prevent the clearing action above alluded to, more nutriment would not be lost to the system by this action than would be gained by the introduction into the body, coincidentally with it, of a larger actual amount of supposed nutritious matters. In fact, all experience tends to show that the state, as well as the chemical composition of our food, must be considered; in other words, that its digestibility, and aptitude for assimilation, are not less important qualities than its ultimate composition."

"Of course, if the branny portions were reduced to a perfect state of fineness, and it were found that this prevented the aperient action, and that other evils were not induced, or, better still, if more of the food material can be separated from the bran, and in either case without more cost than the saving would be worth, there might be some advantage. But, to suppose that whole wheat meal, as ordinarily prepared, is, as has generally been assumed, weight for weight, more nutritious than ordinary bread-flour, is an utter fallacy, founded on theoretical text-book dicta; not only entirely unsupported by experience, but inconsistent with it. In fact, it is just the poorer fed and the harder working that should have the ordinary flour bread rather than the whole-meal bread as hitherto prepared, and it is the over-fed and the sedentary that should have such whole-meal bread. Lastly, if the whole grain were finely ground, it is by no means certain that the percentage of really nutritive nitrogenous matters would be higher than in ordinary bread-flour, and it is quite a question whether the excess of earthy phosphates would not then be injurious."

Dr. Gilbert adds that Mr. J. B. Lawes concurs with him in the opinions stated.