

A HUNDRED YEARS AGO

Extracted from a 1913 issue of *The Practitioner*

THE IMPORTANCE TO LIFE OF THE MINERAL SUBSTANCES IN OUR FOOD-STUFFS

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IT IS VERY EVIDENT that the mineral content of our food-stuffs is a matter of some concern, and any misgivings we may have regarding its sufficiency are due to the fact that there is in this century an ever-increasing tendency on the part of manufacturers and traders to tamper with, and affect prejudicially, many of our staple food-stuffs.

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On account of the introduction, nearly a quarter of a century ago, of the roller process of milling wheat, and of a growing demand for white flour, a very large percentage of the mineral constituents of wheat are now eliminated from marketable flour. Within recent years even the wholesomeness of this has been lowered by the injudicious exposure of much of the flour on the market to the influence of some bleaching reagent like nitrogen peroxide.

For purely mercenary motives, rice is, in these days, often treated in a most inconsiderate manner, for, to hide its imperfections and make it appear more wholesome than it is, the rice is exposed in revolving drums to the influence of materials like paraffin and talc, which give a coating and a gloss to the rice, and thus the defects of the latter are obscured. Beri-beri is a disease which appears, in some way, to be connected with a dietary composed chiefly of rice, and it is quite possible that this disease and some forms of neuritis may really be due to a deficiency of the necessary mineral substances in food-stuffs.

Minerals and life

Parthenogenesis, or the development of unfertilized ova into new and independent beings, has, as a natural phenomenon, been known for centuries. From research in recent years we have learnt that mineral substances possess the power of so influencing some unfertilized ova that they may hereby be induced artificially to display parthenogenesis. From experimental embryology, we learn furthermore that certain mineral agents, in the case of some at least of the lower forms of animal life, dominate and determine the development and physiological state of definite organs and structures.

Sea water – the medium in which the majority of marine animals live, move, and have their being – is admirably well suited for embryological experimental purposes, because of the comparative ease with which its constituents can be ascertained and its ingredients altered at will. Thus, it has been observed that, although the amount of potassium in sea water is extremely small, yet so powerful is the influence of this metal upon development and growth, that the absence of that ion alone is fatal to the echinoids.

To most, if not to all, forms of animal life, it is common knowledge that

the salts of lime are of the greatest importance. If sea water, which holds in solution carbonate of lime, sulphate of lime and the two tribasic phosphates, be deprived simply and solely of its carbonate, then the blastulae of the echinoids so circumstanced present a crumpled and opaque appearance, which should the skeleton have been formed before the larvae were subjected to such impoverished sea water the skeleton then is dissolved. Or if one of the tribasic phosphates be the only lime salt present, then the eggs exposed to such untoward conditions die during segmentation. If the sea water employed in the experiment be deprived of all four of its lime salts, then the cells of the oosperm, as they segment, lose entirely their cohesive properties, and separate from each other forthwith.

Woman's milk, which is to the human infant a complete and perfect food, contains not only proteins, fats, and carbohydrates, but also potassium, sodium, lime, magnesium, and iron, as well as phosphoric acid and chlorine. Chemical analysis leads us, moreover, to believe that the relative proportions of the inorganic material of milk are, to all intents and purposes, the same as those which these same inorganic substances bear to each other in the entire body of the breast-fed infant.

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Quite reasonably, therefore we may assume that, for the due maintenance of the well-being of the body in adult life as well as for the development, growth, and secure establishment of the resisting powers of the body during childhood, a persistent and adequate supply of those inorganic substances, which belong to milk, is as imperative as a continuous and efficient supply of proteins, carbohydrates, and fats.

With the evidences of a deficiency of iron in the system most people are familiar, but with the untoward states, which result from a deficiency of some of the other inorganic constituents, a most profound and intimate knowledge of the chemistry of the body and our daily food-stuffs is necessary. The phosphorus, it would appear, should be presented in the organic form, and so, too, should the necessary monad and dyad metals – in the form, that is, of salts of organic acids – for thus, it would seem, they are more easily and more completely utilized.

It must, of course, be admitted that our knowledge of the direct and active part which mineral substances play in vital and nutritive phenomena is still very meagre, but the important role that they play indirectly is very evident.

1868-2013
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