PROXIMATE PRINCIPLES OF THE HUMAN BODY.

	lbs.	oz.	gr.
1. *Water*, composed of oxygen and hydrogen gases	111	0	0
2. *Gelatin*, of which the walls of the cells and many tissues of the body, as the skin and bones, are principally composed	15	0	0
3. *Fat*, which constitutes the adipose tissue	12	0	0
4. *Phosphate of Lime*, forming the principal part of the earthy matter of the bones	5	13	0
5. *Carbonate of Lime*, also entering into the composition of bone	1	0	0
6. *Albumen*, found in the blood and nerves	4	3	0
7. *Fibrine*, forming the muscles and the clot and globules of the blood	4	4	0
8. *Fluoride of Calcium*, found in the bones	0	3	0
9. *Chloride of Sodium*, common salt	0	3	376
10. *Chloride of Potassium*	0	0	10
11. *Sulphate of Soda*	0	1	170
12. *Carbonate of Soda*	0	1	72
13. *Phosphate of Soda*	0	0	400
14. *Sulphate of Potash*	0	0	400
15. *Peroxide of Iron*	0	0	150
16. *Phosphate of Potash*	0	0	100
17. *Phosphate of Magnesia*	0	0	75
18. *Silica*	0	0	3
	154	0	0

These compounds, in passing away from the body, form many others, which may be here left out of consideration as not forming a necessary part of the fabric of the human body.

None of these constitutents of the body remain permanently in the system, and whilst the old particles are being removed new ones are supplied by the food. It is calculated that in this way a quantity of material, equal to the weight of the whole body, is carried away every forty days. So that we may be said to moult or cast away our old body and get a new one every forty days.

The materials for the food of man, and containing the above elements, are derived from the mineral, vegetable and animal kingdoms. The vegetable kingdom, however is the great source of food to man and animals, as it is in the cells of the plant that the elements undergo those chemical changes which fit them for food. The animal can only supply what it obtains from them, and the substances supplied by the animal kingdom as food are identical with those obtained from plants. To a certain extent the physiological action of food depends upon its chemical composition.—*Guide to the Food Collection of the South Kensington Museum.*

New Zealand Steel.

The occurrence of Titaniferous ores of iron in Canada is well known. Sir W. Logan has long since pointed out their distribution at St. Urbain (Baie St. Paul) and Vaudreuil (Beauce). The following notice of the Titaniferous ores of New Zealand will serve to direct renewed attention to the Canadian deposits of this important material:

Ever since the settlement of New Zealand by Europeans their attention has been daily called to the peculiarities of a kind of metallic sand along the shores of New Plymouth, in Taranaki. This sand has the appearance of fine steel filings, and if a magnet be dropped upon it, and taken up again, the instrument will be found thickly coated with the iron granules. The place where the sand abounds is along the base of Mount Egmont, an extinct volcano; and the deposit extends several miles along the coast, to the depth of many feet, and having a corresponding breadth. The geological supposition is that this granulated metal has been thrown out of the volcano along the base of which it rests into the sea, and there pulverized. It has been looked upon for a long time as a geological curiosity, even to the extent of trying to smelt some of it; but, although so many years have passed since its discovery, it is only recently that any attempt has been made to turn it to a practical account; in fact, the quantity is so large that people out there looked upon it as utterly valueless. It formed a standing complaint in the letters of all emigrants, that when the sea breeze was a little up they were obliged to wear veils to prevent being blinded by the fine sand which stretched for miles along the shore. Captain Morshead, resident in the West of England, was so much impressed with its value that he went to New Zealand to verify the reports made to him in this country, and was fortunate enough to find them all correct. He smelted the ore first in a crucible, and subsequently in a furnace; the results were so satisfactory that he immediately obtained the necessary grant of the sand from the Government, and returned to England with several tons for more conclusive experiments.

It has been carefully analysed in this country by several well-known metallurgists, and has been pronounced to be the purest ore at present known: it contains 88·45 of peroxide of iron. 11·43 of oxide of titanium, with silica, and only 12 of waste in 100 parts. Taking the sand as it lies on the beach and smelting it, the produce is 61 per cent. of iron of the very finest quality; and, again, if this sand be subjected to what is called the cementation process, the result is a tough, first-class steel, which, in its properties, seems to surpass any other description of that metal at present known. The investigations of metallurgical science have found that if titanium is mixed with iron the character of the steel is materially improved; but, titanium being a scarce ore, such a mixture is too expensive for ordinary purposes. Here, however, nature has stepped in, and made free gift of both metals on the largest scale. To give some idea of the fineness of this beautiful sand, it will be enough to say that it passes readily through a gauze sieve of 4900 holes or interstices to the square inch. As soon as it was turned into steel by Mr. Musket, of Coleford, Messrs. Moseley, the eminent cutlers and toolmakers, of New-street, Covent-garden, were requested to see what could be done with the Taranaki steel. They have tested it in every possible way, and have tried its temper to the utmost; and they say the manner in which the metal has passed through their trials goes far beyond anything that they ever worked in steel before. It has been formed into razors, scissors, saws, penknives, table cutlery, surgical instruments, &c.; and the closeness of the grain, the fineness of polish, and keenness of edge, place it in the very foremost rank—almost in the position of a new metal.

Some silk-cutting tools have been made, and so admirably have they turned out that one particular firm will in future use no others. In the surgical instruments the edges have been examined by the microscope, and have stood the test in keeping the superiority. This steel is stated to possess peculiar advantages for gun-barrels and boring-cutters for ordnance purposes. As far as is at present known of this extraordinary metal, it bids fair to claim all the finer classes of cutlery and edge-tool instruments to itself, so well has everything made from it turned out. Messrs. Moseley, in whose hands the sole manufacture of cutlery and edge-tools is vested for this country, have placed a case, filled with the metal in all its stages, in the Polytechnic Institution. There is the fine metallic sand, some beautiful specimens of the cutlery made from it, and the intermediate phases of the iron and steel.—*The Australian Mail.*