element, therefore says Leibig, all the inorganic constituents, viz. salts and earths which remain after the process of putrefaction, must be considered in some respect as manure; when putrefaction takes place nitrogen and carbon escape into the atmosphere as ammonia and carbonic acid, until at last nothing remains excepting the phosphate of lime and other salts in their bones. The excrement of a dog conveys a tolerably correct idea of the chemical nature of animal excrements, "when a dog is fed with flesh and bones, both of which consist in great part of organic substances containing nitrogen, a moist white excrement is produced, which crumbles gradually to a dry powder in the air; this excrement consists of the phosphate of lime of the bones, and contains scarcely 1-100 parts of its weight of foreign organic substances." "The whole process of nutrition in an animal consists in the progressive extraction of all the nitrogen from the food, so that the quantity of this element found in the excrements must always be less than that contained in the nutriments," which however do contain a small proportion of it. "Now this earthy residue of the putrefaction of animals," continues Leibig "must be considered in a rational system of agriculture as a powerful manure for plants, because that which has been abstracted from a soil for a series of years must be restored to it if the land is to be kept in a permanent condition of fertility." The chemical analysis of fertile soils has detected the presence of certain salts and earths in them, which have been also discovered by analysis in the constitution of plants; the abstraction of these substances from the soil deprives it of its fertility, and the restoration of fertility must depend upon the restoration of these salts and earths to the soil. This is effected by the various manures all of which are found to contain greater or less proportions of them. The dung from a horse is found to consist of

Water,	357	0 parts.
Vegetable fibre and animal matter,	135	0
Silica,	3	2
Phosphate of lime,	0	4
Carbonate of lime,	1	5
Phosphate of magnesia and soda	2	9
	500	0

The excrements of cows, black cattle and sheep contain phosphate of lime, common salt, and silicate of lime, and when fresh about 90 per cent. of water. Human excrements contain besides ¾ of their weight of water, nitrogen in variable quantities from 1½ to 5 per cent: 100 parts when dried and exposed to heat, gave 15 parts of ashes, which were principally composed of the phosphate of lime and magnesia.

The vegetable constituents of excrements are not without their influence upon vegetation, for as they decay, they furnish carbonic acid to the young plants, but this influence is not very great, since a good soil needs manure only once in 6 or 7 years, or once every 11 or 12 years, when esparsette or lucerne have been raised upon it; during which time however the quantity of carbon thus given to the land corresponds only to 5. 8 per cent. of what is removed in the form of herbs, straw and grain.

"The peculiar action then of the solid excrements is limited to their *inorganic* constituents, which thus restore to the soil, that which is removed in the form of corn, roots, or grain." The manures of cows and sheep restore silicate of potash and some salts of phosphoric acid to the soil; human fæces give it the phosphates of lime and magnesia, and the dung of the horse gives it phosphate of magnesia and silicate of potash. The straw of litter adds a further quantity of the silicate of potash and phosphate, which if the straw be putrified are in exactly their original condition. It is therefore evident that the soil of a field will alter but little, if we collect and distribute the dung over it; but as a certain quantity of the phosphates must be lost every