

the Latin for *dug up*), and a bed of rock containing fossils is described as *fossiliferous*.

The following are the chief sources of materials of organic origin:—

Calcareous, or the material of limestones.—The most important animal sources are shells of Mollusks, Corals, Crinoids, Foraminifers or the shells of ordinary Rhizopods. The sources under the vegetable kingdom are Coralines of calcareous or semi-calcareous nature, Confervoid and other Algæ, some of which, as the Nullipores, have coral-like forms, while others are minute and disk-shaped, as the Coccospheres or Coccoliths.

The following are analyses: 1 and 2, Corals, *Madrepora palmata* and *Oculina arbuscula*, by S. P. Sharples; 3, shell of a *Terebratula*, by the same; 4, shell of an oyster:—

	1.	2.	3.	4.
	Madrepora.	Oculina.	Terebratula.	Oyster-shell.
Calcium carbonate.....	97·17	95·37	98·39	93·9
Calcium phosphate.....	0·78	0·84	0·61	0·5
Calcium sulphate.....	—	—	—	0·4
Magnesium carbonate.....	—	—	—	0·3
Water and organic matters.....	2·81	3·79	1·00	3·9

In a Millepore (?) Coral Damour found 8·51 per cent of magnesium carbonate in one species, and little in others. Forchhammer obtained 6·36 per cent of magnesium carbonate from the Coral, *Isis nobilis*, and 2·1 per cent in the precious Coral of the Mediterranean, *Corallium nobile*. Of the *Charæ*, among plants, *Ch. fetida* affords 31·33 per cent of ash, 95·35 per cent of which is calcium carbonate.

Siliceous.—The animals that secrete silica are, in the main, (1) the Sponges, and (2) the Radiolarians, a radiate section of the Rhizopods; and the vegetables are chiefly the minute Diatoms and other algaoid species.

Sponges usually consist largely of fine horny fibers. Those used for household purposes are an exception, and are selected for this use because free from such fibers, and therefore pliant and strong. The silica, when present, is in spicules, bristling with horny fibers, easily detected with a good pocket lens. In some species they are so abundant as to make a net-work of silica, as in the pure “glass-sponge,” free from all horny fiber. See page 57 for a figure of one of the species.

Phosphatic.—The chief sources among *animal* materials are bones, teeth, epidermis, and other tissues, excrements, and the shells of *Lingula*, *Discina*, *Obolus*, *Pteropods*, etc.; the outer integuments or shell of Crustaceans, Insects, etc.; and those of a *vegetable* source are the stems, leaves, and fruit of plants, especially the edible grains. The phosphoric acid is usually present in combination with lime as calcium phosphate.

Guano comes mostly from islands or coasts that have been for a long time without human residents, and where birds have had undisturbed possession. It is made chiefly of the excrements of birds (sometimes of bats), and owes its value as a fertilizer to its nitrogen and salts of phosphoric acid. But water, from the rains, percolating through it carries down the soluble phosphates into the underlying material, and if this is coral rock or other loose