splitting into two layers which secrete the primary wall between them. In animal cells, on the other hand, the characteristic method of division is by constrictions or furrows beginning at the periphery and proceeding inwards. The same is true of many Thallophytes.

In recent years the observations of Farr on Nicotiana, Magnolia, Sisyrinchium and other forms, of Tahara on Chrysanthemum, and of the writer on Lactuca (Proc. Roy. Soc. B., vol. 91, p. 222, 1920), have shown that in pollen mother-cells, quadripartition usually occurs by furrowing. Recent critical observations of this process in the pollen mother-cells of Lathræa (in a paper now in the press in *La Cellule*) show that there are, however, essential differences between the process of furrowing as it occurs in pollen mother-cells and generally in Thallophytes, and the manner of furrowing in animal cells.

In Lathræa, a new wall is first formed inside the pollen mother-cell wall. At four equidistant points on this wall tetrahedral thickenings or deposits then appear, and from the apices of these thickenings four furrows grow in until they meet in the centre of the cell. But as the furrows advance, a delicate cell-wall, which is a continuation of the peripheral thickening and which has usually been missed, is deposited in each furrow.

In animal cells, Spek and others have shown that cleavage is accompanied by peripheral currents in the cytoplasm moving in the direction of the furrows. Early observations of J. Loeb and others, recently confirmed by Chambers (in "General Cytology," Ed. Cowdry, p. 296, 1924), show that in various animal eggs as the cleavage furrow is formed pigment granules accumulate in the wall. This process is to be contrasted with the secretion of a wall in the furrows of a dividing pollen mother-cell. Observations of Chambers on cleaving animal eggs also show that an appreciable time is necessary for the walls of the furrow to become non-coalescent when they come into contact. This hardening effect may perhaps be due to the accumulation of these granules in the walls.

It thus appears that there is an essential difference between the process of wall formation in pollen mother-cells and the cleavage of animal cells. In both cases a furrow is formed, but in the former a delicate cell-wall is secreted as the furrow advances, while in the latter there is no such secretion. We may thus say that quadripartition in pollen mother-cells combines the essential features of both methods of wall formation.

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November 10.

Nitrogen and Uranium.

YEARS ago, before the discovery of terrestrial helium, W. F. Hillebrand isolated this gas with nitrogen, in his work on rock analyses. Because a large amount of nitrogen was obtained he attributed all of the gaseous constituent to this source. Some of his analyses are described in the *American Journal of Science*, vol. 140, pp. 384-94, 1890, under the title, "On the Occurrence of Nitrogen in Uraninite and on the Composition of Uraninite in General," and more fully in Bulletin U.S. Geological Survey, No. 78, pp. 43-79, 1890. He concluded that "nitrogen exists in uraninite in quantities up to over 2·5 per cent., and seems generally to bear a relation to the amount of UO_2 present. This is the first discovery of nitrogen in the primitive crust of the earth." "The nitrogen is liberated from the mineral as nitrogen gas by the action of a non-oxidising inorganic acid and by fusion with an alkaline carbonate and probably also caustic alkalies in a current of CO_2." "In a Geissler tube under a pressure of 10 mm. and less, the gas afforded the fluted spectrum of nitrogen with great brilliancy." That uraninite is actually the source of the nitrogen is not open to doubt. Ramsay later confirmed Hillebrand's discovery. The chemical evidence suggests that the nitrogen was present in the mineral in the free state, as occluded gas. The question therefore arises as to how such a quantity of gas could accumulate. The unknown nature of its origin has been frequently mentioned by Dr. Hillebrand during the past thirty years.

Very likely the nitrogen is merely occluded in the uraninite in a manner similar to the occlusion of gases in charcoal. If so, this fact may prove important in problems of laboratory technique. From a more speculative point of view, however, in view of the fact that the atomic weight of uranium is almost exactly an integral multiple (17) of nitrogen, one is attracted to the possibility that the uranium nucleus may contain nitrogen nuclei. Further, the ejection of nitrogen of atomic number 7 from uranium should give the missing, and possibly unstable, element 85, with an atomic weight somewhat higher, to be sure, than should be expected. These latter questionable suggestions, wholly unsubstantiated by radioactive evidence, are offered merely to direct attention to the fact that the presence of nitrogen in uraninite is a problem of interest and importance.

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Edible Earth from Travancore.

IN the Travancore Court of the British Empire Exhibition at Wembley several interesting products of this enterprising State were displayed. Among the medicinal products there were two substances named "Kalpal" and "Kalmadom." From a description drawn up by Dr. Kunjan Pillai, these are said to be deposits found in the clefts and hollows of high rocks "in the form of a brownish-white foam which on exposure becomes harder with time and has the consistence of lime-plaster." The decomposed rock is washed with water to remove foreign matter, as lichens, leaves, etc., and the sediment is made up into balls and dried in the sun. The lumps reduced to powder are said to be a valuable medicine for kidney complaints.

Dr. Pillai has kindly supplied me with samples of these materials, and they were at once recognised as forms of prepared edible earth used throughout India —"Kalpal" was in the form of white balls consisting of sand and clay, while "Kalmadom" was in rounded lumps with the colour and appearance of ochre. In a paper on "Earth-eating and the Earth-eating Habit in India," published in the Memoirs of the Asiatic Society of Bengal, vol. 1, No. 12, 1906, and noticed in NATURE of September 27, 1906, Dr. Mann and I have described about forty different kinds of edible earths, with the results of their chemical analyses, and a history of the habit. They were all siliceous earths, containing in a few cases a fair quantity of iron or lime. In tea estates the coolie women use the unctuous clay taken fresh from exposed deposits, but in the cities the clay is baked and sold in thin plates of various sizes. The earths we examined in connexion with this remarkable habit included the following varieties: Hydrated silica, cream-coloured clay, finely divided felspar, marl, yellow clay, brown clay, greyish calcareous clay, reddish micaceous loam, talc-schist, laterite, halloysite, blackish grey clay, brown earth from ant-hills, and infusorial earth.

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