

Among the white pepper samples one is found, No. 8,985, which yields 7.27 per cent ash; at least twice as high a percentage as any fairly clean white pepper corns should give. It appears, therefore, that, on the assumption of such a standard for pepper ash as I have indicated, the result of analysis of the 73 samples examined would lead to the following classification:—

Genuine pepper,	14 samples.....	19 per cent.
Adulterated pepper,	52 "	71 "
Doubtful	7 "	10 "
	73	100

It is, however, possible to add fraudulently to pepper a substance like pepper dust which contains an excessive amount of mineral matter, and to reduce the total ash in the pepper so adulterated by the further addition of some substance containing very little mineral matter, such, for example, as wheat or rice flour. These substances yield less than one per cent. of ash, and it will be evident that the addition of 50 per cent. of flour to an adulterated pepper yielding 12 per cent. of ash would reduce the percentage of ash in the resulting mixture to 6.5 per cent. The microscopic examination of the sample serves to detect such an addition; and this examination is therefore required as complementary to the estimation of ash.

Before leaving the subject of mineral matter in pepper it may be well to allude to the common adulterant known as pepper dust, and supplied to the trade as P.D.; H.P.D. (hot pepper dust) and W.P.D. (white pepper dust).

The pepper berries, by mutual friction, lose more or less of the dry pericarp and adherent sand in the course of the handling to which they are subject during shipment. The *débris* so resulting is separated by screening in order to render the berries saleable. There can be little doubt that P.D. was originally nothing else than the screenings obtained in this process; but as the supposed exigencies of trade required more of the material than could be supplied for the adulteration of ground pepper, imitations of the genuine pepper-dust were soon manufactured.

Blyth (Foods, p. 497), writes thus:—

"The first, or P.D. used to be principally composed of faded leaves, but linseed-meal is now preferred; H.P.D. is chiefly the husks of mustard, and W.P.D. is ground rice."

Hassall (Foods and Adulteration, p. 538), says:—

"Pepper dust, H.P.D. or P.D. consists either of the sweepings of the warehouses, or else of an article made up in imitation of ground pepper, and expressly used for the adulteration of that article. It is manufactured from rape or linseed cake, mustard husks and cayenne pepper."

I have found in genuine pepper dust (*i.e.* the *débris* of pepper berries), as high as 35.54 per cent. of ash. What it may amount to in the P.D. of commerce, as this is found in Canada, I have not had the opportunity of determining.

Alcohol Extractive.—Alcohol extracts from ground pepper a varying amount of soluble matter, chiefly piperin and resin, the weight extracted depending upon such considerations as (1) the degree of fineness of the powdered pepper operated on; (2) the temperature at which the extraction is performed; (3) the length of time given to the extraction; (4) the form of apparatus employed.

König (Die menschlichen Nahrungs)—und Genussmittel, page 363) points out that while pepper suffers a loss of weight of over 22 per cent. by this process, the weight of the material extracted when determined after drying at 100° C., is only about 12 per cent. of the weight of the pepper used, indicating a loss of about 10 per cent. of volatile matter. He gives the following figures:—