

CONDIMENTS, THEIR CLASSIFICATION, ADULTERATION,  
AND DIETETIC EFFECT.

By-

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## CONDIMENTS, THEIR CLASSIFICATION, ADULTERATION, AND, DIETETIC EFFECT.

The word "condiment" is usually defined in etymological works as that which is used along with something else to preserve or pickle. It comes from the Latin noun *condimentum* which is derived from the Latin verb *condio* meaning I preserve or pickle. No doubt the word condiment originally included only aromatic substances capable of preserving or helping to preserve food from spoiling, but its meaning has extended and we now include under the title "condiments" all the saline, mineral, acid, and sweet vegetable substances, spices and aromatic materials and herbs. It may be helpful further in understanding the substances included and their relation to give a classification of the more common and universally used condiments.

Thudichum arranges them in groups about as follows:-

### GROUP. I.

#### Saline Condiments.

1. Common salt (Sodium Chloride).
2. Saltpetre or Nitre (Nitrate of Potash).

This latter is used with common salt for preserving meat. Its particular function seems to be to maintain and heighten the color of the flesh.

### GROUP. II.

#### Peppery Substances.

1. Black and White Pepper.

Black pepper is the ground berry of the plant *Piper Nigrum*.



White pepper is made from the same berry by previously soaking off the husk in water.

2. Cayenne Pepper.

This is not a true pepper, but is made from the crushed pod of various species of Capsicum. This a very powerful and fiery spice, and must be used with discretion.

3. Chilli or Chili.

This is the strongest variety of Capsium..Placed in substance upon the tongue it has an indescribable terrible effect.

4. Allspice, Pimento, or Jamaica Pepper.

This has a taste and smell very much like that of a mixture of nutmeg, cloves, cinnamon, and pepper. It belongs to the same family as the cloves. The berries are globular, and are 4-6m.m. in diameter.

5. Paradise Grains.

These are employed principally for flavoring beer.

GROUP.III.

Aromatic Substances Proper.

1. Cinnamon.

This is the very thin inner bark of a tree, which is a native of the island of Ceylon.

2. Cloves.

The name cloves comes from the French word clou, for nail. These are the undeveloped flower buds of the cloves tree, which is an evergreen and belongs to the Myrtle family.

3. Nutmeg.

The nut of the Myristica.

4. Mace.

The seed mantle or covering of the nutmeg.



## 5. Cardamons.

These are near relatives of the Paradise grains of Group, II.

## 6. Turmeric.

This powder consists of the ground tubers of a plant belonging to the same genus as ginger.

## 7. Ginger.

Roots used as astringent and for flavor.

## 8. Saffron.

Pistils of Crocus. Almost obsolete.

## GROUP. IV.

Parts Of Cruciferous And Composite Plants With Sharp Oil.

## 1. Mustard.

Seed of an annual herb belonging to the family Cruciferae.

## 2. Anise.

Seed of umbeliferous plant. The seeds are very aromatic and carminative.

## 3. Cummin.

These resemble caraway seed, but are larger, straighter, and of a lighter color.

## 4. Caraway.

A biennial plant of the Parsley family. The seed are used especially by the Germans for flavoring cakes, bread, cabbage, &c.

## 5. Coriander.

The fruit or seed vessels are globular, about twice the size of white mustard seed, and of a light brown color. Each fruit consists of two hemispherical portions, each of which is a seed.

## 6. Horseradish.

The root of a plant. Is eaten raw in flakes, and obtained by scraping or grating.



## GROUP.V.

Aromatic Herbs. (Falsely called savory herbs.)

1. Bay-leaf, used in pickles, soups, sauces, &c.
2. Thyme; the whole plant is used for flavoring.
3. Marjoram, leaves used for meats, soups, sauces, &c.
4. Savory, leaves used in meat soups, sauces, and dressings.
5. Mint, leaves used for flavoring sauce.
6. Rosemary, - leaves used for marenading fish and special kinds of meat. dressings.
7. Sage, leaves use for flavoring meat dressings.
8. Tansy; still used as an astringent medicine.
9. Dill, used with pickles.
10. Chervil, ingredient of soup.
11. Asafoetida, condensed juice or resin, drawn by incision of the roots of *Terula Asafoetida*. Also used in medicine.
12. Essence or Tincture of Spices.

Many spices may be extracted with spirits and the tinctures used to give aroma to finished dishes as cloves, cinnamon, &c.

## Appendix to Group V.

## Green Condiments,

Onions, garlic, leek, shallocks, chives, parsley, pipernel, &c.

## GROUP. VI.

## Acid Condiments.

1. Vinegar; all kinds.
2. Verjuice, juice of unripe fruit or currants.
3. Citric acid.
4. Tartaric acid.
5. Bitartrate of Potash.



GROUP. VII.

Oderiferous Parts of Plants. (Not aromatic)  
and scents extracted therefrom.

1. Rose (flowers).
2. Orange (flowers).

GROUP. VIII.

Culinary Coloring Matters.

1. Saffron; this may be mentioned here again, though registered as a spice.
2. Violet blue, juice of violet flower petals.
3. Rose-red, prepared from petals of Rosa Gallica.
4. Spinage-green, freshly expressed juice or precipitate by boiling such.
5. Cochineal, from cochineal insect.
6. Red poppy, petals are prepared as a syrup.

GROUP. IX.

Varieties and Preparations of Sugar Used in

1. Culinary Operations.

1. White refined sugar, crystallized.
2. Brown unrefined.
3. Invert sugar.
4. Mechanical preparations of sugar.
5. Granitello, small hail sugar.
6. Granito, large hail sugar.

Condiments as a rule are not foods in the strict sense of the term; that is they are not capable of supplying the body with building material or energy, but they are food accessories, so-called because of the power they possess of increasing the appetite, stimulating the secretions, or improving the appearance.



Of all food materials they constitute from their nature, a class more susceptible than others to fraudulent adulterations of the most skilled variety. The <sup>spices</sup> especially of this class are subject to adulteration. The most common adulterants of the spices are the cereal starches, ground shells and fruit stones, gypsum, clay, sawdust, and all kinds of coloring matter.

Taking up the common spices in their order pepper seems as open to adulteration as any. It is said that 70% of commercial pepper is adulterated. To increase the weight of the pepper corns themselves, so as to make the lighter sort equal the heavier, they are sometimes immersed in salt water. Artificial peppercorns are also on the market. They are composed of pepper dust, bran, and other matters as oil cake, common clay, and cayenne. They are sometimes mixed with the genuine, but may be detected by the housewife herself, by soaking a certain number of a sample in water, when the artificial one will fall apart and show the % of adulteration present. The fruit of a wild plant growing in India, is also sometimes mixed with genuine peppercorns. These have a disagreeable odor which is developed by heating. Ground pepper, like all ground spice, is most open to adulteration. Some of the adulterants that have been found in ground black pepper are wheat, pea, sago, rice, buckwheat, corn potato, and rye starch, mustard husks, pepper dust, woody fibre, gypsum, cocoanut shells, olive stones, and bone dust. Of course not all of these are added to the same pepper, but have been found, in samples examined.

The microscope is most useful in the detection of the adulteration of spices. By careful examination of pure samples, the characteristic of each will become fixed in mind and on examining the adulterated samples the foreign material will be readily noticed.



By further study of the structure of the adulterants, a person may become able to state what the adulterants are in every case. Mineral matter is best detected by burning some of the substance and testing the ash.

Fig.II. Plate.I. of drawings appended shows the actual appearance of crushed peppercorns mounted in water and examined under the microscope.

Fig.2. Plate.I. shows the appearance of a cheap grade of ground pepper under the microscope (H.D.Lee's 2oz. 5¢ package). The dark patch on the upper part of plate shows the appearance of mustard husks, and is one of the adulterants used in this case.

White Pepper, as stated before, is from the same berry as the black, the dark outer husk, being removed. The adulteration of white pepper is carried on also to about the same extent as that of black.

Fig.I. Plate.II. shows the appearance of a pure sample of white under the microscope.

Fig.II. Plate.II. shows the appearance of a cheap grade under the microscope (H.D.Lee's 2oz. for 5¢ package). The round grains with concentric rings, are starch grains of wheat. The mass of round grains at the lower edge of the plate, are of allspice, while the starch below the wheat hair are of oats. Both samples No.1, and No.2, were tested by boiling with a little water. No.2, became very much thicker than No.1, showing the presence of foreign starch.

Gayenne is said to be subjected to even more extensive adulteration than ordinary pepper. Some of the adulterants are rice, turmeric, ground crackers, ginger, nutshells, gypsum, brickdust wheat, olive stones, husks of mustard seed, redwood, red ochre, red lead, vermillion, and tar dyes. The object of the use of red lead and



other coloring matters is twofold, first, to conceal other adulterations, and second, to preserve the color of the cayenne, as when exposed to light for any length of time it usually loses part of the bright red color, it at first possesses, and therefore it becomes deteriorated in the eyes of the purchaser. Of course coloring matter does not preserve color, but it supplies the place of that. Salt is employed for the same purpose. It has a remarkable effect in bringing out the color. It is however also used to increase the weight. The adulteration of cayenne with such substances as lead and mercury is prejudicial to health. The salts of these are characterized by the circumstance that they are apt to accumulate in the system, and so produce symptoms of a very serious nature. The quantity of lead introduced into the system in adulterated cayenne also is by no means inconsiderable. To detect lead: Take a little of the cayenne, to this add a little water and a few drops of ammonium sulphide, if lead is present the liquid will become dark, or black. A simple test to determine the quality of cayenne is this, - Heat portion suspected, it should give off acrid vapors.

Fig. I. Plate. III, shows the actual appearance of pure cayenne mounted and examined under the microscope.

Fig. II. Plate. III, shows the appearance of a cheap grade prepared the same way and examined under the same microscope it was (H.D. Lee's 2oz. for 5¢ package). Wheat starch seemed to be one of the substances used in the adulteration of this sample. The patch on the upper part of the plate seemed to be the only cayenne on the plate. No. 1, did not form paste when treated with boiling water, nor turn blue with iodine. No. 2, became pasty, when treated with iodine became of a blue black purple color, thus showing



presence of starch. The mixture of the red coloring matter with the blue would make it appear of a purple color.

Allspice. This is considerably less pungent than other spices. It contains the alkaloid tannin. It is one of the easiest spices to identify under the microscope, by reason of its striking characteristics. The port-colored lumps in allspice furnish one of the most ready means of recognizing it. There is also a rather characteristic grouping of the starch cells. A certain writer in speaking of allspice says, it because of cheapness is rarely adulterated. However from examination of samples of cheap, grade it has been <sup>proven</sup> to be otherwise. Some of the adulterants that have been found in ~~that~~ supposed to be pure allspice, are the cereal starches, cocoanut shells, exhausted ginger, cayenne, olive stones, pepper tumeric, and cloves stems.

Fig.I. Plate.IV, shows the actual appearance of powdered whole allspice mounted in water in water and examined under the microscope.

Fig.II. Plate. IV, shows the appearance of the cheap grade of ground allspice examined in the same way. Samples No.1. when treated with boiling water formed a thin paste, and turned blue with iodine. No.2. formed paste, but did not give quite as clear a blue coloration when treated with iodine. The reason for this was doubtless due <sup>to</sup> the amount of foreign material present.

Cinnamon. There is very little pure cinnamon found in America. What is sold as cinnamon, is not cinnamon at all, but cassia. It is another species of the genus Cinnamomum. True cinnamon is splintery, of fibrous quality, tears rather than breaks and is in small round rolls. The thickness of this bark is about that of brown paper. Cassia is coarser, the bark thicker,



and it is rolled less tightly. It does not tear and if chewed is granular and mucilaginous. It has a more woody flavor. The adulterants of cinnamon are very much like those already given for other spices. They are the cereal starches, nut shells, tumeric, pepper, ginger, mustard, olive stones, and ground foreign bark. The ground bark of elm resembles very much in physical appearance ground cassia. Mahogany sawdust is also sometimes used as an adulterant.

Fig.I. Plate.V, is sample of pure cassia.

" II. " V, i " " " Supposed to be pure ground cinnamon (H.D.Lee's 2oz. for 5¢ package). No.1. thickened slightly when treated with boiling water, and turned dark blue with iodine. No.2. became ropy when soaked in cold water for a short time, was the same the same also when treated with boiling water. It turned dark blue with iodine.

Cloves. The active principle of cloves like all spice, is due to aromatic oil. Tannin is present, an in so constant amount as to be of valuable assistance as guide to their purity. Cloves stems or stalks are very frequent adulterants, and possess some slight pungency. They are commonly identified under the microscope by the large number of bast fibers and stone cells, which should not be found in pure cloves in excess of 5%. Exhausted cloves are not infrequently found on the market. These have been deprived of a portion of the volatile oil, and are much less pungent than the pure article. The common practice is to mix from 10 to 25% of these with the pure powder. A determination of the volatile oil is the only reliable means of telling whether or not they are exhausted. The adulterants of cloves are, corn, wheat, ginger, pea, and rice starch, tumeric, charcoal, sand pepper, ground



fruit stones, cocoanut shells, and sawdust.

Fig.I. Plate.VII, shows the actual appearance of powdered cloves, mounted in water and examined under the microscope.

Fig.II. Plate.VII, shows adulteration of cheap cloves sample of (H.D.Lee's 2oz, for 5¢ package).

Ginger. Ginger is the prepared root of an annual. The rhizomes of ginger of good quality have no epidermis, are plump, of a whitish or faint straw color, soft and mealy in texture, with a short fracture exhibiting a reddish resinous zone about the circumference. They are hot and biting but aromatic. In order to improve the color of ginger and according to some to protect it against the attacks of insects, it is frequently rubbed over with lime. In other cases it is washed in chalk and water, when it is called whitewashed ginger, lastly the surface of ginger is occasionally bleached, by means of a solution of chloride of lime, and sometimes by exposing it to the fumes of burning sulphur, it is made to present a white floury appearance. By these processes an inferior ginger is often made to assume the appearance equal of the descriptions. The freshly dug ginger, which is scalded and dried at once, is what forms the so-called black ginger. There are two kinds of exhausted ginger commercially available for admixture with pure ginger or ground spice as an adulterant. One is the product left after extraction with strong alcohol in the making of extract of ginger, and the other residue from extraction with dilute alcohol or water in the manufacture of ginger-ale. Exhausted ginger is rather inert, and for this reason is rarely substituted wholly for the pure variety. It is usually mixed with pure ginger in varying proportions. Beside exhausted ginger the most common adulterants of powdered ginger are tumer-



ic, wheat, corn, rice, and sawdust.

Plate.VII, shows samples of pure ground ginger, root and cheap ground ginger, under the microscope. The latter of all the cheap spices examined seemed the most free from adulteration.

Mustard. This is one of the most universal and wholesome of condiments. The ordinary adulterants of it are wheat flour, and tumeric. The employment of the first named article, necessitates the use of the other, to bring up the color to the original standard. Gypsum is also found. A certain sample examined in <sup>Massachusetts</sup> contained 21% of this substance. Other adulterants are cayenne pepper, charlock, potato, barley, rice, corn, pea starch, plaster of Paris, chromate, clay, and yellow ochre. A test for tumeric is as follows:- To a small amount of the mustard add a few drops of ammonia, if tumeric is present an orange red coloration is result.

Fig.I. Plate.VIII, shows actual appearance of pure ground mustard seed, mounted in water and examined under the microscope.

Fig.II. Plate.VIII, shows the appearance of an adulterated sample, water mounted and examined with the microscope. From the bright yellow color of the latter (H. D. Lee's two ounce five-cent package) the presence of tumeric was suspected and this upon applying ammonia test proved to be true. Sample No. 1 did not thicken with boiling water, as pure mustard contains no starch. No. 2 thickened and became a blue green color with iodine.

Nutmeg. This spice since it is more often sold in the whole form is less liable to adulteration than other spices. Of late years, however, considerable ground nutmeg is found on the market, wild nutmegs are sometimes found mixed with the genuine whole nutmegs for adulteration. The quality of nutmegs is also affected sometimes by extraction of the aromatic oil. Samples



of ground nutmegs have been found in Massachusetts adulterated with wheat and nut shells. One sample was found to contain 25% of ground cocoanut shells. The spices as a whole appear not adulterated to such an extent as some writers claim; but they are adulterated, therefore, it may be well to emphasize before leaving this subject of spices, the importance whenever possible of purchasing them in the whole form and pulverizing them at home. This increases the amount of work but by this method a more pungent spice is obtained and no risk is incurred of so serious an adulteration.

Salt. Salt besides being a condiment, is a food. It, because of its cheapness, is rarely adulterated. Most of it contains small quantities of magnesium chloride, but this is found with it in nature, and is not harmful.

Vinegar. Vinegar is the most important acid condiment. It is the product formed by the acetic acid fermentation of an alcoholic liquid under the influence of the organism *mycoderma aceti*, existing in the mother of vinegar. The acetic acid of good French vinegar exists in the proportion of 5%. Ordinary table vinegar contains between 2% and 7%. Water is one of the most common adulterants of vinegar. Others are  $H_2SO_4$ ,  $HCl$ , and muriatic acids, burnt sugar or caramel, the spices, and lead arsenic and zinc. Some simple tests for some of these are as follows: To detect sulphuric acid--Take one part of vinegar, add to this a few drops of Barium Chloride, any considerable precipitate shows presence of  $H_2SO_4$ . To detect hydrochloric acid--Take a



small quantity of the vinegar, to this add a few drops of Silver Nitrate a while flocculent precipitate indicates <sup>presence</sup> of HCl. To detect copper--Immerse a clean bright steel knife in the vinegar; if copper is present the knife will become coated. Mineral acids may be detected in general by adding to about 50 cc of vinegar a small bit of soda the size of a wheat grain. Shake it to disseminate through the fluid, then boil, cool and add a drop of iodine solution. If a blue coloration occurs no mineral acid is present. In the presence of an appreciable amount of mineral acid the starch will be converted to dextrine and sugar, and no coloration will be produced by the iodine. The color of spurious vinegar is often improved by the addition of caramel or burnt sugar. Spices are often added to increase the pungency and are best detected by first neutralizing the vinegar with sodium carbonate and then tasting. Under these conditions the admixture of spices is rendered very apparent. Copper, lead, and zinc are usually derived from the vessels or utensils used in the manufacture of the vinegar. Arsenic may be found when glucose has been employed as an ingredient, or source of the vinegar the arsenic being in this case probably due to impure sulphuric acid used in the manufacture of the glucose.

Sugar. The sugars are without doubt the purest food products on the market. They are very rarely adulterated. Granulated sugar is 99.8% sucrose.

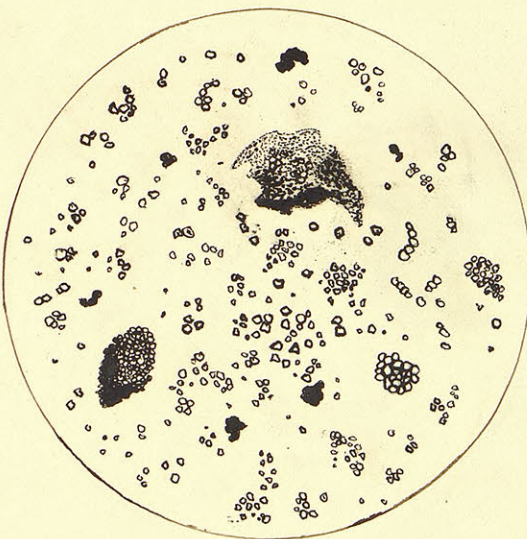
Now as to the effects of the condiments upon the system, the various authorities hold different opinions. Condiments taken in moderation they agree are beneficial but taken ~~it~~ in excess are very harmful. The skill of the cook, therefore, consists in steering between the two digestion possibilities hinder and help.



The condiments when taken into the body excite to activity the digestive organs and increase the flow of the secretion of the digestive juices. They also act as antiseptics. In some cases they prove beneficial in correcting the injurious properties belonging to some article of food. When taken in excess, they prove harmful in that they produce over-stimulation and thereby in some cases cause more food to be taken than is really necessary and at the same time they irritate the delicate membranes. This abuse of the digestive organs by the continued excessive use of condiments may result in gastric hyper-anaemia and catarrh and in some cases disordered intestinal digestion.

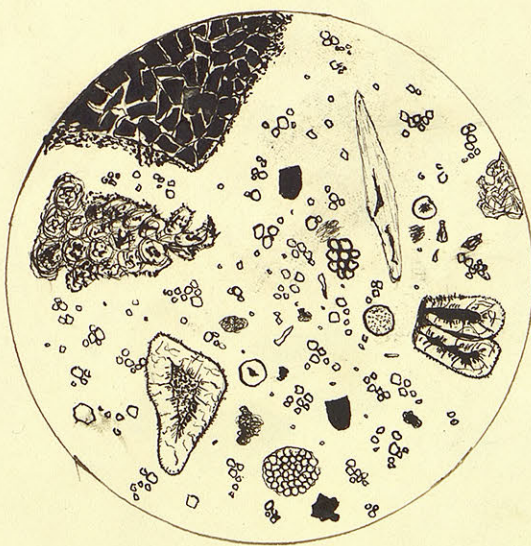


1



Pure Black Pepper

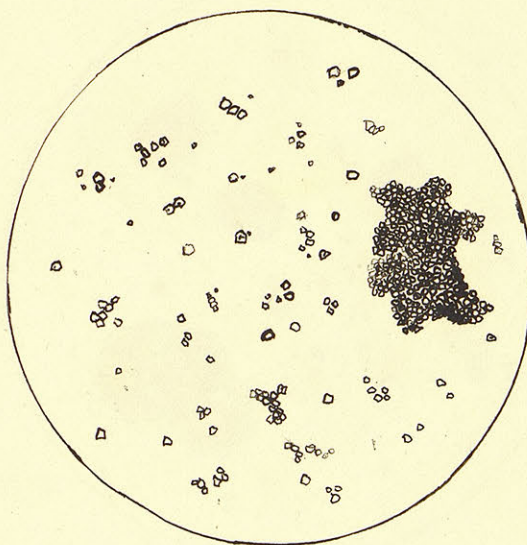
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Adulterated Black Pepper

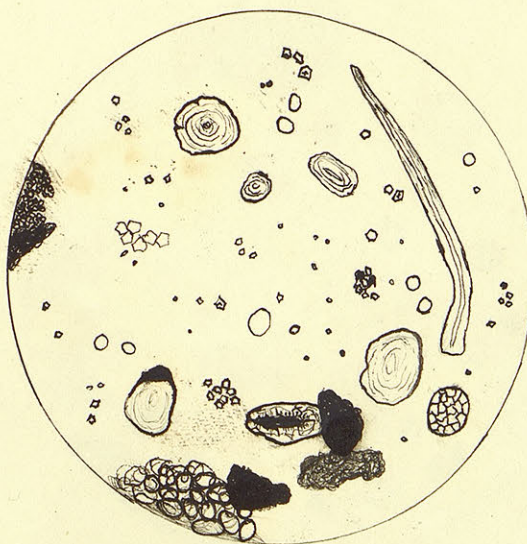


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Pure White Pepper

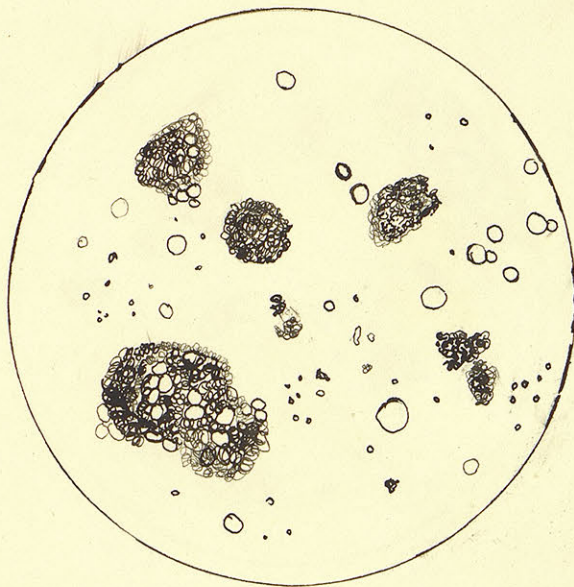
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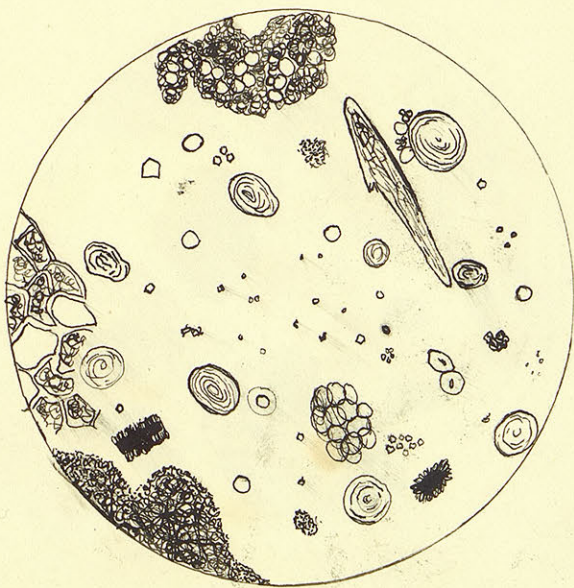


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Pure Cayenne

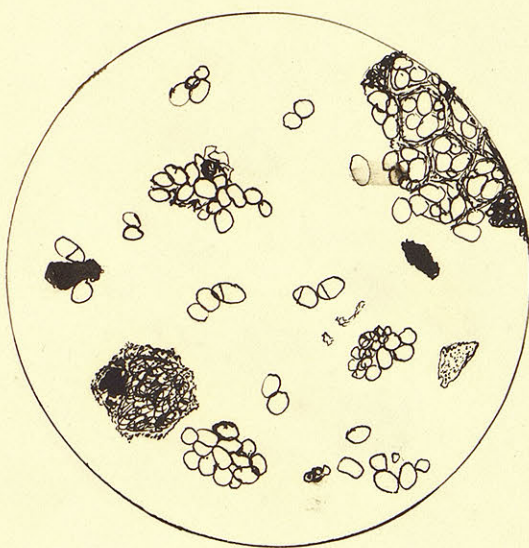
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Adulterated Cayenne

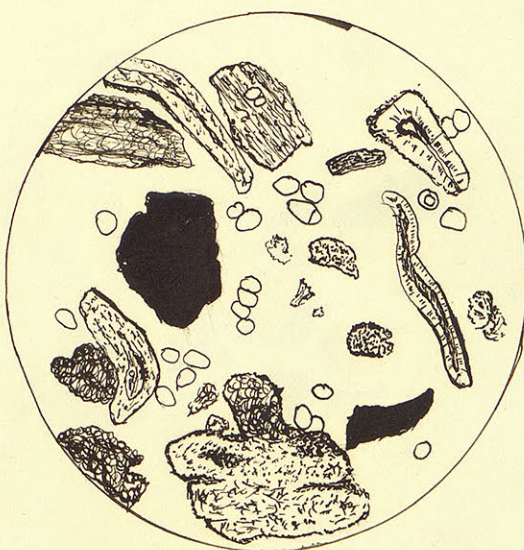


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Pure Allspice

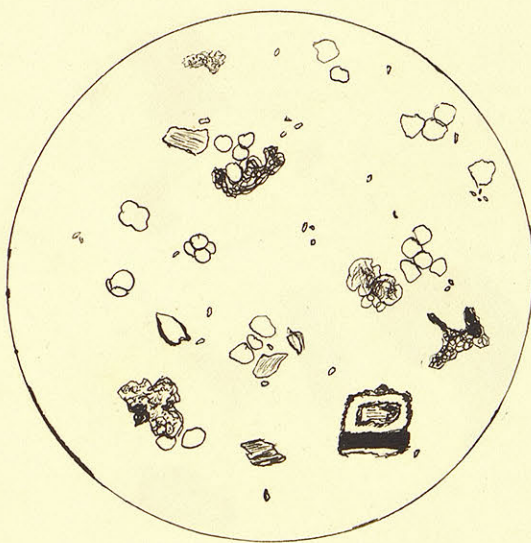
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Adulterated Allspice

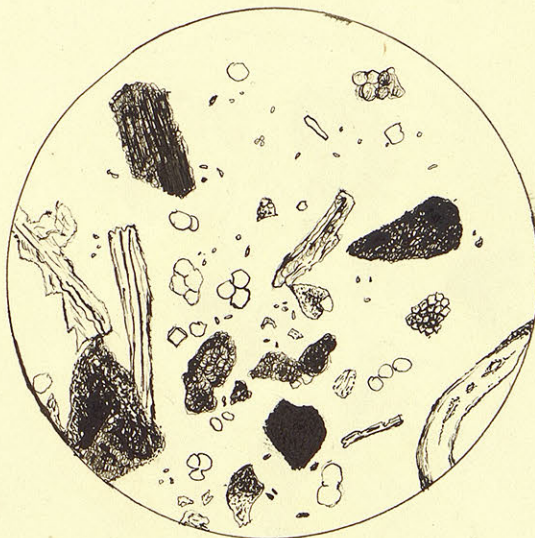


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Pure Cinnamon

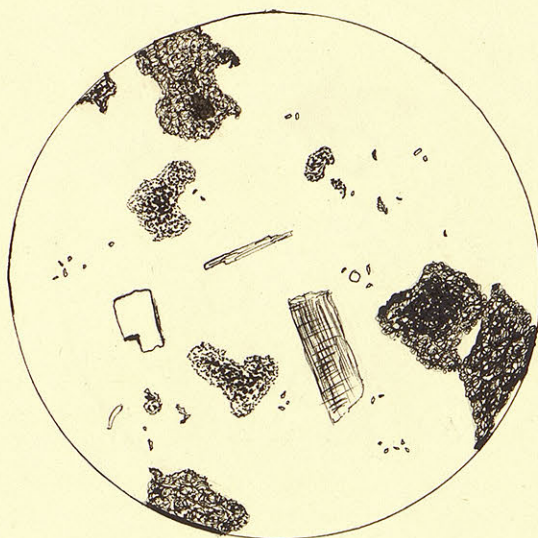
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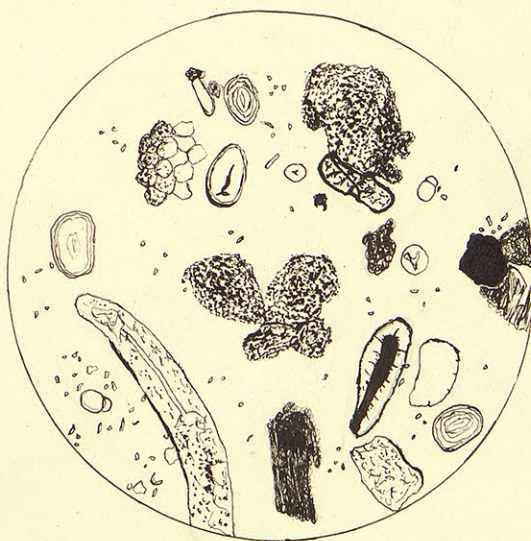


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Pure Cloves

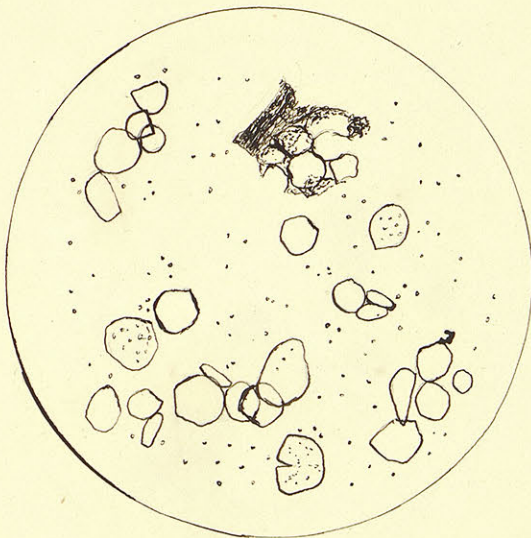
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Adulterated Cloves

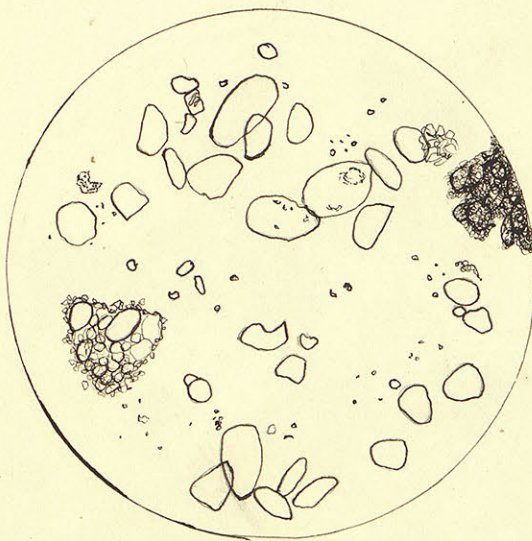


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Pure Ginger

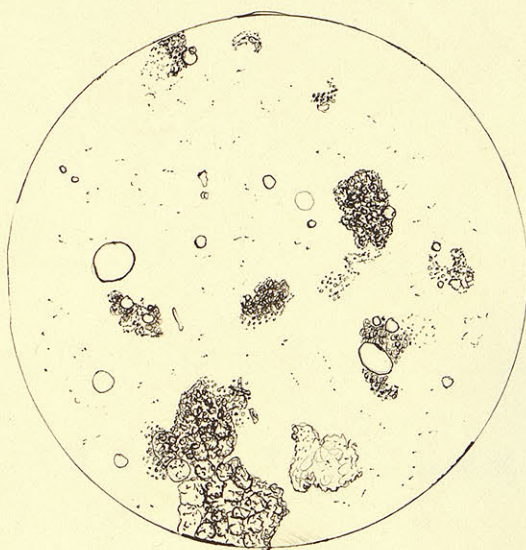
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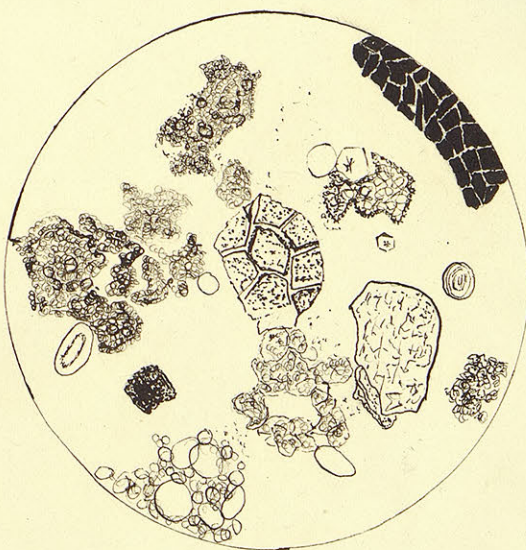


1



Pure Mustard

2



Adulterated Mustard