Biochemical, Bacteriological, etc.

Pectin Liquefaction during ripening of Rosaceous Fruit. C. Griebel. (*Zeitsch. Unters. Nahr. Genussm.*, 1925, **49**, 90–94.)—The process of pectin formation has been followed by the microscopical examination of prepared sections of *Pyrus domestica*, and it appears that true pectin originates in the intracellular tissue by hydrolysis of protopectin. As soon as a sufficient stage of ripeness has been reached by fermentation, hydrolysis of the intracellular pectose or protopectin begins and proceeds at a rate dependent upon the temperature, producing a viscous fluid, "pectinschleim," which is an intermediate product between the insoluble protopectin and the more soluble pectin. The mechanism of these changes is discussed in detail. H. E. C.

Methods for the Determination of the Products of the Hydrolysis of Proteins. J. Froidevaux. (*Ann. Falsificat.*, 1925, **28**, 151–161.)—The methods available for the determination of the products of proteolysis are discussed and criticised. For its quantitative evaluation three forms of nitrogen must be determined, *viz.* total nitrogen, ammoniacal nitrogen, and amino-nitrogen. The first presents no difficulty, the second can be satisfactorily determined by well-known methods, *e.g.* by the use of an alkaline earth for the liberation of the ammonia;

the third, however, involves the determination of amino-nitrogen+ammoniacal nitrogen, from which figure the ammoniacal nitrogen is subsequently deducted. For this determination two methods are available—van Slyke's nitrous acid process and Sörensen's "formol" titration. The former is not altogether satisfactory because certain products of hydrolysis, such as purines, react very slowly and incompletely, and others, such as uric acid, do not react at all. Sörensen's method, however, is quite satisfactory. Details are given of a slight modification of this method and, as the results of the formol titration are a little low in the presence of the other forms of nitrogen, they are multiplied by the factor 1·04. Tables of results on known products of proteolysis are given. H. E. C.

Vitamin-*A* Content of Fresh Eggs. J. C. Murphy and D. B. Jones. (*J. Agric. Res.*, 1924, **29**, 253-257.)—Feeding experiments show that eggs are rich in vitamin-*A*. This substance is probably associated with the egg-oil in the yolk, and this, it is calculated, has a vitamin-*A* potency from 2 to 4 per cent. of that of the most potent cod-liver oil. From 0·5 to 0·75 grm. of whole egg daily provides sufficient vitamin for the growth of young rats, and 0·25 grm. sufficed to cure advanced cases of xerophthalmia. H. E. C.

The Vitamin Content of Soya Beans. C. Hornemann. (*Zeitsch. Unters. Nahr. Genussm.*, 1925, **49**, 114–120.)—By feeding experiments on rats it was found that soya beans are rich in vitamins; the fat contains vitamin *A* which is also found in the extracted oil, and the hulls or waste products or soya cake contain vitamin *B*. The proteins of the soya bean are very fattening and promote growth in rats. H. E. C.

Further Report on Imparting Antirachitic Properties to Inert Substances by Ultra-Violet Irradiation. A. F. Hess and M. Weinstock. (*J. Biol. Chem.*, 1925, **63**, 297–304.)—Wheat which has been activated by means of ultra-violet irradiation retains its antirachitic potency for a period of weeks. Etiolated yellow wheat as well as green wheat can be rendered active in this way. The same is true of the etiolated (yellow) leaves of lettuce. When irradiated with the mercury vapour lamp for a period of 1 hour at a distance of 1 ft., they acquired antirachitic value. These etiolated plants contained carotinoid pigments, but little, if any, chlorophyll. A solution of chlorophyll is not endowed with antirachitic power by irradiation, nor are haemoglobin, red blood cells, cream, the phosphatide of yolk of egg, or glycerol. On the other hand, refined wheat flour undergoes activation. Vegetable oil retains its protective power for a period of at least 6 months. It can be activated by an exposure to the lamp for a period of 2 minutes or less. Oxygen plays no rôle in this process, which takes place in an atmosphere of nitrogen. Fractionation showed that the active principle is present only in the unsaponifiable portion of the irradiated oil. Irradiated linseed oil was used. The active principle is only present in the non-saponifiable fraction of cod-liver oil; thus it would seem that irradiation of linseed oil had produced a substance similar in its properties to that contained in cod

liver oil, especially since the unsaponifiable fraction of irradiated linseed oil increased the percentage of inorganic phosphorus in the blood of rats. The results of the experiments are shown in tables. P. H. P.

Antirachitic Value of Irradiated Phytosterol and Cholesterol. I. A. F. Hess, M. Weinstock and F. D. Helman. (*J. Biol. Chem.*, 1925, **63**, 305–308.)—Since the main constituent of the non-saponifiable fraction of vegetable oil consists of phytosterol, experiments were carried out to ascertain whether phytosterol could be activated by means of irradiation. Phytosterol, nearly pure, prepared from cottonseed oil, was given to rats which were receiving the standard low phosphorus diet. A table shews that the irradiated preparation conferred protection, whereas the non-irradiated phytosterol did not protect against rickets. Similarly, crystalline cholesterol extracted from brain tissue conferred absolute protection when irradiated, yet ordinary cholesterol possessed no antirachitic value. Irradiated lanoline conferred slight protection. Cholesterol has been regarded as chemically inert. A hypothesis is offered in regard to the bearing of these results on the pathogenesis of rickets. It is suggested that possibly cholesterol in the skin is activated and rendered antirachitic by the solar rays and similar artificial radiations. This presupposes the formation of active cholesterol within the skin and its further transport by way of the circulation.

P. H. P.

The Diagnosis of Decay in Wood. E. E. Hubert. (*J. Agric. Res.*, 1924, **29**, 523–567.)—Methods for the complete diagnosis of the decays commonly found in wood are given, together with a study of a large and representative number of wood-destroying fungi. The macroscopic, microscopic, and cultural characteristics of the various organisms are given in detail, providing the necessary data for the complete identification of the fungus decomposing the wood. Study is made of the size and shape of the various bore holes, hyphal characters and methods of penetration of the cell walls. There are numerous photomicrographs and tables of cultural characters for which it is necessary to consult the original.

H. E. C.

Preparation of Polychrome Methylene Blue and Thiazine Red. F. Proescher and A. P. Krueger. (*J. Lab. Clin. Med.*, 1924, **10**, 153–159; *Chem. Abstr.*, 1925, **19**, 529.)—Polychrome blue for staining sections may be prepared by adding 20 to 20 mgrms. of sodium peroxide to 100 c.c. of a 1 per cent. solution of methylene blue, and heating the mixture for 15 minutes on the water-bath, after which the solution is neutralised with 1·18 c.c. of 0·1 *N* hydrochloric acid for each 5 mgrms. of sodium peroxide used.

The thiazine reds are prepared by treating a solution of 50 grms. of methylene blue in 200 c.c. of water with 5 grms. of sodium peroxide at 75° to 80° C., filtering off the precipitate on a Buchner funnel, drying it at 37° C., powdering it, and finally drying it over calcium chloride. Frozen sections can be rapidly stained with a solution of 0·5 grm. of thiazine red in 100 c.c. of 1 per cent. acetic acid.

An Apparatus for Measuring the Oxygen Consumption of Tissues. A. E. Koehler. (*J. Biol. Chem.*, 1925, **63**, 475–477.)—Various methods for measuring oxidation in tissue suspensions and cultures are discussed. The author uses a 500 or 700 c.c. Erlenmeyer type flask for the material to be oxidised, because of the large surface exposed for oxygen consumption. A slight shaking motion keeps the tissue suspension sufficiently saturated with the oxygen at the tension within the flask, so that this does not become a limiting factor. A levelling manometer at the side measures the oxygen consumed. The carbon dioxide liberated is absorbed by the soda-lime tube through which the air is circulated by means of a rubber bulb fitted with valves at the top of the flask or by a special rotary gear pump in place of the bulb. The apparatus is used singly or in groups, mounted in a frame in a constant temperature water or air bath. Fifteen to 30 grms. of finely cut fresh tissue are suspended in about an equal amount of Ringer's solution or blood plasma. The stop-cock at the top of the apparatus is opened to the air and the liquid in the manometer burette set at a low level. After temperature equilibrium has been obtained, the stop-cock is closed, the carbon dioxide absorbed by about 20 compressions of the bulb and the original volume observed. Clove oil may be used in the manometer, or distilled water with a few drops of 0·01 *N* sodium hydroxide and phenolphthalein. The alkalinity of the solution decreases the surface tension of the meniscus. Check readings on the burette must be taken by oscillating the meniscus by means of moving the levelling bulb and noting whether it comes to rest at the same value as before. A diagram of the apparatus is given. P. H. P.