clusive diet of dry whole milk. Of the two limiting factors which she indicated, protein and inorganic salts, the latter appears to be the more important; but on a dried milk ration supplying both of these factors in added amounts the rearing of young has not been generally successful. On a food consisting of dried whole milk 93 per cent., salt mixture 2 per cent. and yeast 5 per cent., we have now obtained a fourth generation. Animals on this food without yeast (98 per cent. milk powder, and 2 per cent. salt mixture, with an additional 0.2 per cent. Fe citrate) become pregnant and young are born, but they are small and scrawny in appearance and usually die within 3 or 4 days. Sometimes no trace is found of these litters, the only evidence being the drop in weight of the female. What constituent of yeast is responsible for the successful reproduction secured by its addition remains to be determined by the work at present under way.

122 (1704)

The presence of vitamine A in the peel of common citrous fruits

By ETHEL COOPER (by invitation).

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About a year ago, preparations of orange peel were added to a diet otherwise free from the fat soluble vitamine. The possibility that such preparations might contain fat soluble A was based on the hypothesis of Steenbock[1] that the fat soluble vitamine is a yellow vegetable pigment or a closely related chemical compound.

The peels used for a determination of their fat soluble vitamine content were faultless and of the deepest yellow color. The outer surface of the dried peels was grated enough to break the tiny pockets which contain the yellow oil. Peels and gratings were then extracted on the water bath with ether and alcohol. These extracts were evaporated down to dryness. The gummy mass thus obtained was stirred thoroughly into a diet otherwise free from fat soluble vitamine and then fed to a number of white rats. The results yielded indubitable evidence that the waxes and oil

[1] Steenbock, *Science*, 1919, i, 352.

of the orange peel are rich in the fat soluble vitamine. On this diet young rats have matured, mated, and raised young. Control experiments showed the diet, without the preparation of orange peel, to be free from fat soluble A.

Experiments now in progress indicate that similar preparations made from lemon and grape fruit peel likewise contain the fat soluble vitamine.

A detailed account of the experiments will appear in the course of the year.

123 (1705)

Effects of age and of the inclusion of salts on the heterotropic action of colloidal bodies of cytological interest.

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Auxographic measurements of the swelling of sections of dried plates of agar and of gelatine previously described show that the relative enlargement of a colloidal body in its different axes will be determined largely by the unequal stresses which may be set up, as for example when liquid agar or gelatine is poured on glass and dried without shrinking in area. It was pointed out that sections from such plates of agar increased only 3 or 4 per cent in length while swelling 3,000 or even 4,000 per cent in thickness, and that sections of gelatine increased 8 to 40 per cent in length while swelling from 500 to 2,000 per cent under the auxograph.[1]

Tests of sections of plates of pure agar freshly made and a year old have recently been made. Plates which swelled 2,000 per cent in water when freshly made August 1, 1919, increased but 1,600 per cent July 1, 1920. Plates swelling 3,200 per cent when young increased but 2,000 per cent when nine months old. This total decrease was accompanied by lessened swelling in thickness and increased swelling parallel to the broad surfaces of the plates. The relative increase in length and width of sections of old plates was double that in the same plates when newly made

[1] MacDougal and Spoehr, "Hydration of Amino Compounds," PROC. SOC. EXPER. BIOL. AND MED., 1919, xvii, 33–36.