The proteins in gluten, freshly washed out from flour, are also solubilized by the Swan process—when the material is left in contact with the reagent overnight at room temperature. Some of the carbohydrate contained in the gluten complex is also dissolved.

Work is proceeding on the separation of the soluble carbohydrate from the soluble protein derivatives and on a comparison of these derivatives from wheats of different types.

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Interaction of Anti-Staling Agents with Starch

Following an observation that sucrose stearate, a compound claimed to have anti-staling activity, precipitated starch from solution (to be published), the study was extended to other substances known to have anti-staling properties.

As most known anti-staling agents have surface-active properties, two surfactants were included in the programme—a sulphonated hydrocarbon (anionic) and cetyl trimethyl ammonium iodide (cationic). For purposes of comparison, *n*-butanol and thymol (amylose precipitants) were also included.

The following compounds, claimed to have anti-staling activity, were tested: sucrose monostearate, sucrose distearate, polyoxyethylene monostearate, glyceryl monostearate (commerical), glyceryl monostearate (pure, Myverol 18-06) and stearoyl tartrate.

Solutions of the test agents were added to solutions of wheat starch to give final concentrations: starch 0·5 per cent, sodium chloride 0·05 per cent, test agent 0·005–0·075 per cent (except in the case of stearoyl tartrate where the maximum concentration was 0·03 per cent, due to its low solubility). The amount of precipitate was determined turbindimetrically.

Butanol, thymol and the two ionic surfactants had virtually no precipitating effect in this concentration range. Among the anti-staling agents only stearoyl tartrate showed little precipitating power. The most effective precipitants were sucrose monostearate, glyceryl monostearate (pure) and polyoxyethylene monostearate. Glyceryl monostearate (commercial) was slightly less effective and sucrose distearate much less effective.

These results show that five out of six substances with anti-staling activity give a precipitate with starch. Whether or not this reaction is a pre-requisite for all anti-staling agents is not certain, but in any event this reaction must change the characteristics of flour products.

Ofelt *et al.*[1] reported that glyceryl monostearate decreased the crumb firmness of bread (an anti-staling characteristic) and that glyceryl distearate had no such effect, nor did it act synergistically with the monostearate. Our results show that glyceryl monostearate (pure) is a more effective precipitant for starch than the commercial material, but only slightly so. However the commercial glyceryl monostearate employed contained about 33 per cent monostearate with the remainder largely distearate. If there were a strict parallel between the baking and precipitation tests, it would be expected that there would be a greater difference between the two samples of glyceryl monostearate in the precipitation tests. Ofelt *et al.*[2] also found that the crumb softening effect decreased in the order polyoxyethylene monostearate, glyceryl monostearate, sucrose monostearate but the precipitation tests showed little difference between the three compounds. In addition, Axford and his colleagues[3] have found no direct correlation between the amount of precipitate which we have observed with starch and the effectiveness of an anti-staling agent in bread. Thus one is led to the conclusion that complex formation between known anti-staling agents and starch must occur in flour products and that it may well explain the action of these agents as bread improvers; if this is so, then the effectiveness of such an agent in bread must be determined not only by the amount of complex formed, but also by the properties of that complex, such as its permeability to moisture.

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A New Inhibitor of Serotonin Metabolism

It has been postulated that a change in amine concentrations in the brain is causally related to the activity of a drug in the central nervous system. In 1940, Mann and Quastel[1] suggested that the central stimulant activity of 'Benzedrine' was related to its ability to inhibit the oxidation of tyramine by amine oxidase. Fellows and Bernheim[2] observed an excellent correlation between the increased motor activity in the rat and the inhibition of amine oxidase by a series of aryl-2-aminopropane derivatives. Recently, Tedeschi *et al.*[3] observed that *SKF* No. 385, 2-phenyl*cyclo*propylamine, in the rabbit, demonstrated an activity suggestive of *in vivo* monoamine oxidase inhibition. Since this compound was not a hydrazine, it was decided to study its effect on amine oxidase activity.

In vitro amine oxidase activity was determined[4,5] by measuring the rate of disappearance of serotonin incubated with rat brain homogenates. Adult male rats were killed by exsanguination, the brains were rapidly removed, weighed and homogenized in 2 volumes of distilled water. 1 ml. of brain homogenate was added to 300 μgm. of serotonin in phosphate buffer and the mixture incubated for 60 min. at 37° C. Optimal substrate concentration was determined to be 300 μgm., and serotonin disappearance was found to be linear between 15 and 60 min. A 15-min. preincubation of the drug with the rat brain homogenate, prior to the addition of substrate, was utilized to obtain maximal inhibition. Serotonin