Run 5 was conducted without the addition of steam to the desolventizing vapor stream. In the other runs, steam was added to the vapor stream to a level of approximately 15% by weight. Non-condensable gases were present in the vapor stream during all of the runs at a level of approximately 30-50% by weight. This amount of non-condensables was inherent with the operation of the pilot plant and could not be lowered. Their presence would have no known effect on the NSI results obtained, and present indications are that they may have only a minor effect on the residual-solvent values. Admittedly the presence of the non-condensables would lower the residual-solvent values at equilibrium. However, due to the short residence time of the flakes in the desolventizing zone, equilibrium undoubtedly is not reached. Also it has been reported by Chu, Lane, and Conklin (3) and Wenzel and White (8) that the rate of vaporization of a liquid into its superheated vapors is more rapid than into an atmosphere of air. The two opposing forces would tend to minimize the effect of the non-condensables on the resulting residual-solvent values. The final answer can only be obtained by additional experimentation.

The results given in Tables I and II show that soybean flakes can be desolventized in several seconds without excessive residual-solvent loss and without denaturing the protein fraction. It is also apparent that, because of the reduced retention time in the desolventizing zone, the flakes may be heated, even in the presence of steam, to temperatures considerably above the level previously thought to be the maximum permissible for the production of meal with a high NSI. Higher discharge temperatures for the desolventized flakes mean potentially lower residual-solvent contents compared to other systems. It is not implied that this unit will completely remove the solvent as do the combination processes of desolventizing and deodorizing as commercially practiced, but rather that it will reduce the solvent content to a lower value than existing desolventizing units. For safety in subsequent handling of the residual flakes, an additional step involving stripping probably will be necessary. It must be determined for each installation whether it is economical to recover the solvent removed in this final stage.

Beckel *et al.* (1) have estimated that the temperature coefficient of the reaction velocity for the denaturation of soybean protein is approximately 3.5 for a 10°C. rise in temperature. Using this value, which normally would be considered low for this type of reaction and the previously stated satisfactory conditions of 5 minutes at 170°F. as a basis, it may be calculated that an increase in the discharge temperature to 220°F. would require that the desolventizing operation be completed in 9 seconds or less if denaturation is to be minimized. The solubility results obtained in the operation of the flash desolventizer are not therefore totally unexpected.

Commercial Possibilities

The simplicity of the flash desolventizing system can best be appreciated by persons having had experience in the operation of both of the older systems described above. The equipment has fewer moving parts than the conventional desolventizing units, and consequently maintenance costs should be lower. This system will occupy less space than existing desolventizing equipment. Its initial cost of fabrication and installation in commercial sizes should not exceed that for existing systems and probably would be considerably less for both large and small installations.

Two applications of this unit in commercial processing are apparent. First, because of the negligible quantity of material retained in the system at any instant, this unit is especially useful in pilot-plant investigations or other installations operating intermittently. Second, this equipment will provide soybean and other solvent-extraction processors with a compact desolventizing unit operating in parallel with existing desolventizing equipment which normally produces denatured meals for use in animal feeds. The new unit could operate either intermittently or continuously to produce a supply of essentially undenatured soybean flakes consistent with the demand for specialty products. This procedure will eliminate excessive storage and reduce inventories of this material, whose protein solubility is known to decrease with time (6). Addition of an auxiliary desolventizer would minimize the production of improperly processed materials resulting from changes of operating conditions necessary under the present installations. The desolventizing system described should be useful in any process requiring the rapid removal of an organic solvent from a residual solid material for the protection of a heat-sensitive constituent of that solid.

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Correction

Norman O. V. Sonntag of Colgate-Palmolive Company, Jersey City, N. J., writes that several minor errors in the paper "Reactions of Fatty Acid Chlorides. I. Preparation of Fatty Acid Anhydrides," J. Am. Oil Chemists' Soc., *31*, 151 (1954), have been discovered:

p. 153. In Table II, under column labelled Anhydrides, last two entries should read Oleic.
p. 153. Line 11 should read 38.0-40.0°.
p. 154. Figure 1: ordinate of curves should read % Absorption.
p. 155. Table IV: under column labelled Method, delete the superscript a from the entries of B and I.