voted much time and study to the formation of an industry wide marketing and research organization, the National Tung Oil Marketing Cooperative. Mr. Ballard recommended that serious consideration be given to the proposed organization. "Because I believe in the plan, I have caused my company to sign as a charter member of the new organization," he asserted.

Instrumentation of the Food Processing Industry Continues

Automatic evaporator control improves product quality and lowers cost

CHICAGO.—The food industries are coming in for their share of attention in the trend towards greater instrumentation in the process industries. Food processing applications were indicated by many of the more than 300 booths of exhibits at the conference and exhibit of the Instrument Society of America here on Sept. 21 to 25.

Evaporation. Whether an evaporator is used to concentrate milk, sugar, or grape juice, comparable instrumentation is employed, said J. E. Barber, Taylor Instrument Co. As the food industry's demands grow for product quality improvement and lower costs for evaporator operation, the application of more complete and satisfactory instrumentation become increasingly important.

Heat input, liquid feed level, concentration of final product, rate of evaporation, and final effect pressure or temperature may be controlled automatically and thus decrease evaporation costs and improve the quality of the product, according to Mr. Barber.

Heat input to an evaporator may be controlled by regulating either the pressure of the steam chest or of the vapor space above the evaporating liquid. In either case temperature-activated controllers are made to operate the valve governing the incoming steam.

Steam chest control is the more desirable method for heat sensitive materials. If the vapor space pressure is the controlled variable, any build-up of solids on the evaporator tubes will result in ever increasing steam chest pressure to maintain the vapor space pressure, and will, therefore, overheat the liquid being concentrated.

Concentration. Concentration of the product is the most vital, and also the most difficult, variable to control in an evaporator. Concentration cannot be measured directly, but must be related to some characteristic such as density, viscosity, or the boiling point rise. Boiling point rise is the most desirable variable to control, but it is only useful when it changes sufficiently with concentration. The difference between the temperature of the product withdrawn and the vapors (after removing the superheat) is a function of the boiling point rise.

Density may be measured by circulating a small stream of the product through a sample column. A tube immersed to constant depth in the liquid in the column is connected to an air source and a manometer. A small quantity of air is allowed to bubble through the tube. Any change in density of the liquid is reflected in a change in back pressure which is recorded by the manometer. There are several other continuous density measuring devices, including a submerged float whose varying buoyancy may be recorded.

Feed Level. Control of the feed level is a necessary part of the concentration control. The concentration control mechanism will open the withdrawal valve, but a level controller is needed to govern the addition of more dilute material to the evaporator effect.

Liquid level control on all effects enables each one to operate at maximum efficiency. Low levels decrease the available heat transfer surface, while high levels cause excessive hydrostatic pressure in the lower portion of the liquid, resulting in boiling starting too far up the body tube, said Mr. Barber.

Recording spectrophotometer, shown by Beckman Instruments, automatically runs more samples in an hour than an operator could handle in a day with conventional equipment, according to company

Industry

Carnation Centralizes Research In New California Laboratory

Unit under study flakes and cooks cereals in one short operation

CARNATION CO., which moved its headquarters to Los Angeles in 1949, formally opened its new research facilities in nearby Van Nuys, Oct. 8. The new lab, costing about $750,000 and containing 31,000 square feet of floor space, consolidates in one place the research operations Carnation previously carried on in Milwaukee and Oconomowoc, Wis., and Oakland, Calif.

The new laboratory consists of six laboratory rooms (for engineering, cereals, bacteriological, biological, processing, and analytical work) plus pilot plant space for "wet" (milk) and "dry" (cereal) product processing. Carnation, like most of the food industry, is not neglecting short time, high temperature processing. An experimental Martin aseptic canning unit has a prominent place in the "wet" pilot plant. In the "dry" pilot plant room, a unit Carnation has dubbed a flame flaker is being used to investigate the high-short possibilities for processing the so-called instant cereal preparations. This unit, which is a typical cereal industry flaker, has its rolls heated by direct application of gas flames. It thus flakes and cooks a cereal within a matter of seconds and is expected to eliminate the present two-step operation of coldroll flaking followed by cooking.

Carnation, like most companies, is mum about the specific products or processes it will work on in the new lab. However, Phillip K. Bates, Carnation general manager of research and president-elect of the Institute of Food Technologists, points out the following as being among the challenges facing his company and others in the field:

Special Diets for the Aged. Canned baby foods, unknown in the not too distant past, are now an established consumer item, and they serve a large and