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Phenomena to Be Considered in the Storage of China Wood Oil. Francis W Hopkins. A large amount of China wood oil received in December, 1925, was found to have turned to a semisolid.

Refer to Scientific Circular 270 of the Paint and Varnish Manufacturers Association, May, 1926, the last two paragraphs. Oil was heated and drawn in tank wagon to storage tanks. The following is an analysis of the oil when received:

Color	Brown
Odor	Characteristic
Appearance	Clear
Sp. Gr. 15° C.	0.9410
R. I. 25° C.	1.5185
Acid	4.86
Brown's heat test	11½ minutes

Two months later it was noticed that a spongy-like polymer had formed at the top of the tank to a depth of six to eight inches, the oil at the bottom of the tank was a semiliquid, and an analysis of the oil drawn from the bottom and heated is as follows:

Color	Brown-yellow
Odor	Characteristic
Appearance	Cloudy, opaque
Sp. Gr. 15.5° C.	0.9414
R. I. 25° C.	1.5127
Brown's heat test	9½ minutes
Acid	6.20

Samples from the top of the tank and from the bottom gate were sent to one of the leading experts on China wood oil in the paint and varnish industry, and the analysis is as follows:

Sample from top of tank 45 per cent oxidation products, of alpha and beta ealostearin; 55 per cent of alpha ealeostearin and olein. Sample from bottom gate 87.5 alpha ealeostearin and olein 12.5 per cent beta ealeostearin.

After getting in touch with several large varnish manufacturers we drew the following conclusions from their responses, and from a large amount of data which we had obtained.

1. That there was a catalyzer present in the tanker, such as sulfur and the tanker not being quite full, there was a sufficient amount of air present to oxidize the top and the ealeostearin formed at the top was insoluble in the oil at the bottom. We found that by skimming this oxidized product in 24 hours about two or three more inches formed, which appears like a reproducing action in the presence of air.

2. It has been found that when a tung nut of high oil content has been pressed at a very high pressure, the oil after standing a year in a closed can formed a considerable amount of beta ealeostearin, and which there was a small amount of the oil poured from the can, so that there was an air space at the top, about a month later the oxidized products formed, such as the polymer at the top of our tanks.

3. That this oil was struck by the sunlight when it was in its original baskets in China, and after being in a tank for several months, which is heated, the formation of the beta ealeostearin was increased and that in the presence of air in the tanker; the oxidation products of the two acids started a formation on top.

Not only has oil of this nature been received by the paint and varnish industry, but by other industries which use China wood oil. At the writer's suggestion, a large manufacturing concern which had been experiencing trouble with its China wood oil tested for sulfur, of which a small trace was found. Previous shipments were also examined, but no sulfur could be found. The spongy-like oxidized products of alpha and beta ealeostearin were removed from the tops of our storage tanks, and the remaining semiliquid heated to a temperature of 300° F., and drawn from the tanks. This oil can be used very satisfactorily in the manufacture of varnish by the addition of a small amount of drier other than that which the formula calls for.

Conclusion: A test of the oil, or series of tests, should be compiled by the

various societies interested in the paint and varnish industry so that such a condition could be detected when the general analysis is made of a sample.

Studies in the Boiling of Linseed Oil. J. S. Long, C. J. Knauss and J. G. Smull. Linseed oil was heated at 293° C. in vacuo, and in nitrogen. Samples were withdrawn at intervals and determinations made of the molecular weight, hexabromide number and iodine number. In separate experiments linseed oil was heated with S, Se, and Te. Samples withdrawn at intervals and the molecular weight determined. S, Se, and Te evolved as volatile sulfides, selenides, and tellurides were caught in ammoniacal $CdCl_2$ and the S, Se, and Te determined by titration.

Linolenic acid was prepared, converted to the hexabromide and heated with zinc dust and glycerol. The product is a glyceride. Its ultimate analysis corresponds to the mono-glyceride of linolenic acid. Constants were determined. This product was heated at 293° C. in air and in nitrogen. Samples were withdrawn at intervals and the molecular weight, hexabromide number and iodine number determined. The data thus determined indicate that at least two different types of reactions occur when linseed oil is heated. The data permit drawing some deductions as to the mechanism of these reactions.

A Comparison During Drying of the Acid Values and Iodine Numbers of Linseed Oil Containing Different Driers. W. Lloyd Evans, Paul E. Marling and Stewart E. Lower. In a series of experiments dealing with relationship between the acid value and iodine number of a drying film and use of different driers it was found:

1. The acid value of film is an increasing function of the time.
2. The iodine number of the film is a decreasing function of the time.
3. The acid value of the film is an increasing function of the concentration of the drier.
4. The iodine number of the film is a decreasing function of the concentration of the drier.

Studies of the Vitamin Potency of Cod Liver Oils. XXI. The Stimulation of Reproduction by Fat-Soluble Vitamins. A. D. Holmes, A. W. Doolittle and W. B. Moore. In preliminary studies, feeding a vitamin-rich cod liver oil to domestic fowl increased the number of chicks hatched. This investigation of thirty-two weeks' duration, was conducted to obtain data concerning factors associated with reproduction. A crude, vitamin-rich cod liver oil prepared by the steam process was fed to Rhode Island Red pullets. The experimental pens contained 75 birds which were fed ¼, ½, 1, and 2 cc. of oil per bird per day. Data were collected concerning egg yield, weight of egg, fertility, hatchibility, number of eggs containing blood spots, and mortality of chicks. Data were also collected concerning the effect of stimulated reproduction on the physical condition of the birds. It was found that supplementary vitamin feeding materially increased egg production, hatchibility, and viability of chicks; slightly increased fertility and weight of eggs; and decreased the number of eggs containing blood spots. The birds receiving the added vitamins maintained their body weight during the experiment and possessed a higher body resistance to disease, as indicated by a lower mortality than that of the control birds.

The Vitamin a Content of Pacific Coast Salmon Body Oils. Lyman C. Boynton and Roger Williams Truesdail. A quantitative study was made of the vitamin A content of the body oils of five species of Pacific Coast salmon. The chinook salmon was found to be the richest in this vitamin, followed in turn by sockeye, silver, humpback and chum varieties. Comparison was made with a sample of cod liver oil, one milligram per day of which was sufficient to induce a weight increase of approximately 25 grams in eight weeks in young rats whose store of vitamin A had been exhausted on an A-free basal diet. Young rats receiving 83 mg., 149 mg., and 226 mg. per day respectively of the body oil of chinook, sockeye, and silver salmon made an average growth of about 18 gr. over the eight weeks. Feeding 227 mg. per day of humpback oil furnished enough vitamin A for maintenance, while animals fed 221 mg. daily of chum salmon oil died before the expiration of the experimental period.

A correlation was found between the pigmentation of the oils and the vitamin A content. A notable exception was observed in the case of an unusually light specimen of chinook salmon which, however, is as a rule quite red. It was found to be richer in vitamin A than the more highly colored sockeye.