the component isomers was equal to the percentage of the corresponding triacylglycerol type in the class.

Starting from these 3 series of equations, calculation of the percentages (a, b, c, d, e, f, g) of the 7 triacylglycerol isomers was easily achieved. The values thus obtained are shown in the last column of Table III.

Instead of the diacylglycerols 11, those of the class 12 (fatty acid composition in Table V) could also be used. The figures so calculated for the major 2 isomers (respectively, 41.9 and 51.6%) were very close to those reported in Table III (41.5 and 52.0%).

For the other classes (001, 011, 002) it was necessary to take into account 2 classes of diacylglycerols at the same time. Only one class could be used if slight approximations were made for isomers present in very low amounts. These approximations do not, in fact, introduce a higher error than do the analyses.

Overall results. Using the above calculation methods, the percentages of 84 isomers (Table VII) were determined in the peanut oil analyzed. Only 17 isomers were present in amounts of at least 1%. The first 3 together represented 43.5% of the total and the first 4 more than 50%. The major triacylglycerol was trioleoylglycerol, accounting for ca. 25% of the oil.

Next, 14 isomers from 0.5 to 1%, 25 from 0.1 to 0.5% and at least 28 in amount lower than 0.1% were found. The isomers that represented less than 0.01% were not considered.

In 69 isomers, especially in the first 42, the fatty acid esterified in the 2-position was found to be unsaturated, either linoleic acid (18.0% in the oil) in 30 isomers, or oleic acid (60.3% in the oil) in 39 isomers. However 15 triacylglycerols had a saturated fatty acid in central position, but the major one accounted only for 0.5%. Palmitic acid was present in 11 isomers, stearic acid in only 4 and the very long-chain fatty acids (20:0, 22:0, 24:0) were never found in internal position.

In the triacylglycerols with one very long-chain saturated fatty acid, either 2 molecules of oleic acid, one of linoleic (in 2-position) and one oleic acid, or 2 molecules of linoleic acid were combined. In trace amounts, 2 very long-chain fatty acids were present together in external positions, with an unsaturated fatty acid, mainly linoleic acid, in the 2-position.

These data can be compared to those published by Manganaro et al. (16), after adding, in most cases, the proportions of the 2 isomers they have determined, which correspond to only one isomer in our work. In spite of very similar fatty acid compositions of the 2 oils, certain triacylglycerols have proportions slightly different in each work. We have found 24.7% of trioleoylglycerol, as compared to 21.9% by Manganaro et al., for the same proportion of oleic acid in the 2 oils (60.3 and 60.4%, respectively). We have also found 7.6% of the isomer 18:1-18:1-18:2 instead of 11.0% by these authors, and 11.2% of the isomer 16:0-18:1-18:1 instead of 9.9%. These last 2 differences can this time be explained by a lower proportion of linoleic acid in the oil we analyzed and a higher proportion of palmitic acid.

In Table VII, the percentages calculated according to a 1,3-random-2-random distribution (34,35) are also reported. This hypothesis assumes 2 separate fatty acid pools, one for the 1- and 3-positions, the other for the 2-position. It can be seen that, for the main triacylglycerols, these

TABLE VII

Component Isomers (mol %) of Triacylglycerols of Peanut Oil

Isomers[a]	Mol %		Isomers	Mol %		Isomers	Mol %	
	Experimental	Random[b]		Experimental	Random		Experimental	Random
Percentage > 1						0.1 > Percentage > 0.01		
18:1-18:1-18:1	24.7	21.7	16:0-18:1-20:0	0.56	0.45	16:0-18:1-18:1	0.09	0.04
16:0-18:1-18:1	11.2	11.3	16:0-18:1-24:0	0.53	0.47	22:0-16:0-18:1	0.09	0.08
18:1-18:2-18:1	9.5	10.5	18:1-16:0-18:1	0.53	0.48	18:1-16:1-18:2	0.09	0.03
18:1-18:1-18:2	7.6	8.4	0.5 > Percentage > 0.1			20:0-18:1-22:0	0.07	0.14
16:0-18:2-18:1	5.2	5.5				16:0-18:0-18:2	0.07	tr
18:1-18:2-18:2	4.8	4.1	16:0-18:2-22:0	0.45	0.43	16:0-18:0-18:1	0.06	0.02
18:0-18:1-18:1	4.7	4.0	20:0-18:1-18:2	0.43	0.34	18:0-18:2-22:0	0.05	0.15
22:0-18:1-18:1	2.5	3.4	18:0-18:2-18:2	0.37	0.37	18:1-16:1-18:1	0.05	0.08
18:0-18:2-18:1	1.8	1.9	24:0-18:1-18:2	0.36	0.35	18:1-18:0-18:2	0.05	0.02
20:0-18:1-18:1	1.7	1.8	16:0-18:1-20:1	0.34	0.40	22:0-18:1-20:1	0.05	0.12
16:0-18:1-18:2	1.7	2.2	24:0-18:2-18:2	0.34	0.17	18:0-16:0-18:1	0.05	0.09
20:1-18:1-18:1	1.5	1.5	20:1-18:1-18:2	0.33	0.29	18:2-16:0-18:2	0.05	0.02
16:0-18:2-18:2	1.4	1.1	16:0-18:2-20:1	0.30	0.19	24:0-16:0-18:1	0.04	0.04
24:0-18:1-18:1	1.4	1.8	16:0-18:2-20:0	0.29	0.22	16:1-18:1-18:2	0.04	0.04
16:0-18:1-16:0	1.2	1.5	18:0-18:1-22:0	0.28	0.31	16:1-18:2-18:1	0.04	0.10
16:0-18:1-18:0	1.1	1.0	16:0-18:2-24:0	0.28	0.23	16:0-16:1-16:0	0.03	0.01
22:0-18:2-18:1	1.0	1.6	18:1-16:0-18:2	0.24	0.18	20:0-16:0-18:1	0.03	0.04
1 > Percentage > 0.5			18:0-18:1-18:0	0.24	0.18	16:0-16:1-18:2	0.03	tr
			20:0-18:2-18:2	0.23	0.16	16:1-18:2-18:2	0.03	0.02
16:0-18:1-22:0	0.92	0.89	20:1-18:2-18:2	0.20	0.14	16:0-16:1-18:1	0.02	0.04
18:2-18:2-18:2	0.73	0.39	16:0-16:0-18:1	0.19	0.25	20:0-16:0-18:2	0.02	0.01
20:0-18:2-18:1	0.72	0.84	18:0-18:1-20:0	0.18	0.16	18:0-18:2-24:0	0.02	0.08
16:0-18:2-18:0	0.72	0.50	18:0-18:1-24:0	0.17	0.17	20:0-18:2-22:0	0.02	0.07
18:1-18:2-20:1	0.69	0.73	22:0-18:1-22:1	0.16	tr	18:2-18:0-18:2	0.02	tr
22:0-18:1-18:2	0.69	0.66	22:0-16:0-18:2	0.15	0.01	20:0-18:1-24:0	0.01	0.07
18:0-18:1-18:2	0.66	0.77	18:0-18:1-20:1	0.14	0.14	22:0-18:1-22:0	0.01	0.13
24:0-18:2-18:1	0.65	0.88	16:0-18:2-16:1	0.14	0.03	18:0-18:2-20:0	0.01	0.08
18:2-18:1-18:2	0.65	0.81	16:1-18:1-18:1	0.13	0.20	18:2-16:1-18:2	0.01	tr
16:0-18:2-16:0	0.64	0.71	22:0-18:2-22:1	0.13	tr			
22:0-18:2-18:2	0.58	0.32	16:0-16:0-18:2	0.10	0.05			

[a]The 3 component fatty acids and the fatty acid in the 2-position are known.

[b]Composition calculated according to a 1,3-random-2-random distribution (33,34).