

on the fact that after acid hydrolysis glutamic acid and glycine, respectively, were revealed. No acetyl hydrazide could be demonstrated in the hydrazinolysates of the dipeptide either by chromatography or electrophoresis. As a control N-acetyl glutamic acid was subjected to hydrazinolysis. Acetyl hydrazide was disclosed in this sample both by chromatography and electrophoresis, but no pyroglutamic acid hydrazide. The results of the hydrazinolysis give further proof that the N-terminal glutamic acid residue is not N-acetylated.

Although the picture of the hydrazides in the hydrazinolysate of the dipeptide is complex the results do not exclude the possibility that a pyroglutamic acid residue might be N-terminal in human peptide B. Further work will clarify this point.

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## The Fatty Acid Composition of Filbert Oil

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Filbert nuts are all of the species *Corylus avellana*. Most of the more recent investigations<sup>1-5</sup> indicate oleic acid to be the main constituent of the oil accompanied by smaller amounts of linoleic acid and saturated fatty acids. In contrast, however, Fang and Bullis<sup>6</sup> in 1949 reported a high content of eicosenoic acid (15–20%), together with a small amount of docosenoic acid (0.4%).

In the present investigation, filbert nuts grown in Hellerup, Denmark, in 1961 were used. The methyl ester fraction of the fatty acids was examined by gas-liquid chromatography. The calculated fatty acid composition (in weight per cent of the fatty acid mixture) was as follows:

	%
Palmitic acid	5.0
Palmitoleic acid	0.1
Stearic acid	1.4
Oleic acid	77
Linoleic acid	16.0
Linolenic acid	0.3
Arachidic acid	0.1
Eicosenoic acid	0.1

As apparent from these data the filbert oil is of the olive oil type. Obviously, eicosenoic acid is only a trace constituent of the present filbert oil. Probably, the double bond is located at C-11, though the chromatographic data do not provide any rigorous proof. Acids with 22 carbon atoms are absent, or present in at most 0.05%.

Although considerable variations may occur in the fatty acid composition of seeds within botanical varieties of the same species, it seems doubtful that *Corylus avellana* should contain such high quantities of eicosenoic acid as reported<sup>6</sup>. The American authors utilized a 48-inch glass helix packed column operated at a pressure of 2 mm for the ester fractionation. According to the experience of the present

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author, these conditions may result in the production of some unsaponifiable matter. In the calculating procedure employed<sup>6</sup>, this again may give rise to a considerably higher content of eicosenoic acid than that actually present. No attempts were made to isolate and identify the acid.

*Experimental.* The kernels (16.1 g) from filbert nuts were extracted with ethyl ether for 8 h in a Soxhlet apparatus as described<sup>7</sup>; extraction was repeated until completeness (40 % oil). After saponification with ethanolic potassium hydroxide and acidification with sulphuric acid the fatty acids were isolated by extraction with ether and converted into methyl esters by refluxing with methanol containing a little sulphuric acid.

A Perkin-Elmer gas chromatograph (Fraktometer model 116 E), equipped with a katharometer detector and 4 mm-columns was used for the separation. Silicone elastomer (E 301) and silicone grease on Celite<sup>8</sup> in 1 m and 2 m columns, respectively, were used as unpolar stationary phases. Reoplex 400 on Celite (in the ratio 1:5), in a 2 m column, served as the polar phase. Helium was used throughout as a carrier gas, and the sample size varied between 1 and 5 mg.

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## Copper(I) N,N-Dialkylthiocarbamates

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In a previous paper<sup>1</sup> the author has discussed the N,N-dialkylthiocarbamates of copper, silver and gold. They have all turned out to be polymeric, in solution as well as in the solid state, and many of them have given evidence of possessing interesting structures<sup>2</sup>.

In order to throw light on the unique properties of these compounds, the investigations have been extended to include thiocarbamates as well.

In Table 1 there is a summary of some data describing the copper(I) dialkylthiocarbamates investigated. In a previous paper<sup>3</sup> Fredga has reported that the diethyl compound seems to be hexameric (molecular weight determination in chloroform) and the investigations of the author also indicate that most of these compounds are hexameric. However, some of them also seem to be tetrameric. The degree of polymerity, amongst other things, depends on the method of preparation.

Some of the compounds show, as do the corresponding dithiocarbamates, a pronounced tendency to crystallize with solvents. Thus the copper(I) dipropylthiocarbamate crystallizes with a third of a mole of acetone. The "crystal solvent" can be

Table 1. Data for the salts  $[R_2N-CO-SCu]_n$ . The molecular weight determinations are made cryoscopically in benzene.

R	m.p. °C	n	Cu calc.	Cu found
Methyl	220 (decomp.)		37.89	37.29
Ethyl	220 (decomp.)	6	32.46	32.43
Propyl	180–183	6	28.39	28.40
Butyl	131–133 <sup>a</sup> 120–122	6 and 4?	25.23	25.06
Isobutyl	230 d.	6	25.23	25.24
Isoamyl	166–171	6	22.70	22.67

<sup>a</sup> Polymorphism?