are likely chemoreceptors; all dendrites are enclosed in a single sheath), and the third sensillum with one sense cell and mechanoreceptive function. PETERS[18] in a sensillum of blowfly larvae with unknown function and 3 sense cells; in this case each dendrite is enclosed in its own sheath. ADAMS[19] in taste hairs of a blood-sucking fly with 3–5 sense cells; the dendrites are enveloped in a single sheath with a compartment for each dendrite.

In the following cases the dendrites have been found to be enclosed by a sheath throughout their passage through the lumen of the trichogen cell: PETERS[20] in two types of mechanoreceptors in the blowfly, each with one sense cell. PETERS and RICHTER[21] and STÜRCKOW[22] in predominantly 5-celled hairs of the blowfly; all dendrites are enclosed in a single sheath with a compartment for each of them. PETERS and RICHTER[21] in chemoreceptive papillae of the blowfly with usually 4 sense cells.

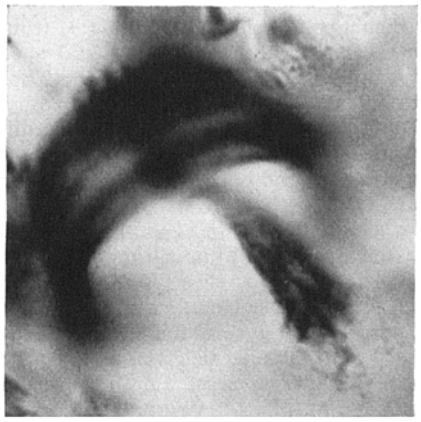

Fig. 2. Oblique view distal into the socket of a taste hair of *Calliphora* (stained with Methylene Blue in fixed form, teased preparation). Dendrites entering into the proximal part of the sheath, which ends here in 5 terminals, are visible only through the microscope. ×2000.

The position of the sheath in the taste sensillum of the blowfly is shown in Figure 1, while a photograph of the sheath is given in Figure 2.

SLIFER et al.[16,17] and RICHARD[15] observed that the sheath was cast off with the cuticle during molting. Therefore they called it a cuticular sheath. Although these sheaths are probably homologous with the scolops of the scolopidial organs, they should not be called a scolopoid sheath or scolops, as PETERS[20] has rightly pointed out, as long as the proof of homogeneity is lacking.

The function of the clinging sheath and an embedding material within the sheath around the dendrite could be mechanical protection, physiological protection, or a combination of these functions. In planning electrophysiological experiments and interpreting their results the possible existence of a high extracellular shunting resistance should be considered.

Zusammenfassung. In den letzten Jahren wurde gezeigt, dass um den distalen Teil der Dendriten von mechano- und chemorezeptorischen Sinneszellen eine Hülle vorkommt. Ihr möglicher Einfluss auf die gemeinsamen elektrophysiologischen Merkmale der Sinnesorgane wird diskutiert.

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The Occurrence of Δ^3-*trans*-Hexadecenoic Acid in Phosphatidyl Glycerol from Spinach Leaves

The preponderance of poly unsaturated fatty acid constituents in the lipids from photosynthetic tissues is well established. Galactosyl glycerides have been shown to contain over 90% of linolenic acid[1,2], but the phospholipids extracted from green leaves appear to contain, in addition to linolenic and linoleic acid, palmitic acid in quantity[1–4]. Apart from differences in biosynthetic mechanisms, the distinction in fatty acid constituents among these lipid classes is of interest with respect to their function in different biological interfaces. By contrast to most of the phospholipid species the galactolipids appear to be concentrated mainly in the chloroplast[5,6]. Therefore it is important to establish the fatty acid composition of phosphatidyl glycerol, since this compound has been demonstrated to be the major phospholipid of the photosynthetic apparatus[5–7].

Phosphatidyl glycerol was recently obtained in a pure form[8], and on isolating it from spinach leaves (*Spinacea oleracea*) a unique distribution of certain fatty acids became apparent. The fatty acid pattern of the total lipid fraction from spinach leaves appeared to be identical to that reported by others[9–11], and in good agreement with the studies of DEBUCH a *trans*-hexadecenoic acid (16:1

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Fatty acid composition in spinach leaves (*Spinacea oleracea*), as determined by gas-liquid chromatography

Fatty acids	16:0	16:1	16:1 *trans*	16:3	18:0	18:1	18:2	18:3
Total lipid	17.0	tr[a]	2.4	7.4	0.5	6.0	14.6	51.4
Acetone soluble lipid	6.7	tr	0.5	12.3	0.5	4.1	8.8	67.0
Acetone insoluble lipid	24.7	tr	4.8	tr	tr	9.2	25.0	36.3
Phosphatidyl glycerol	20.0	tr	31.7	–	0.6	2.6	8.0	37.1
Lyso phosphatidyl glycerol[b]	32.4	tr	0.5	–	1.2	2.4	2.1	61.4
Fatty acid liberated from phosphatidyl glycerol[b]	11.1	tr	58.9	–	–	3.1	14.5	12.4

[a] Traces of compounds less than 0.5%. [b] Use was made of phospholipase A from *Crotalus adamanteus*.

trans) and a hexatrienoic acid (16:3) were found to be present (Table). As outlined by DEBUCH these unsaturated C_{16} fatty acids are specific for the chloroplast. Fractionation by means of acetone-$MgCl_2$ precipitation rendered an interesting distribution of both fatty acid constituents. The 16:1 *trans*-fatty acid was recovered in the precipitate containing, together with other lipids, practically all of the phospholipids, whereas the 16:3 fatty acid residue appeared to be present in the soluble fraction which is rich in galactolipids (Table). After two chromatographic runs of the acetone insoluble fraction on silicic acid columns, we obtained a chromatographically and analytically pure fraction of phosphatidyl glycerol (glycerol-phosphorus ratio: 2.04). Surprisingly, gas chromatography of the fatty acid methyl esters demonstrated that the 16:1 *trans*-fatty acid represented as much as 30% of the total fatty acid residues of phosphatidyl glycerol (Table). The fatty acid methyl ester was isolated in a pure state by means of gas chromatography. The IR-spectrum and oxidative degradation in perfect agreement with the work of DEBUCH[9] showed this acid to be identical with Δ^3-*trans*-hexadecenoic acid.

The fatty acid composition of the lecithin fraction from spinach leaves was found to be very similar to that reported by SASTRY and KATES[1] for lecithin from runner-bean leaves. Although the characterization of the other phospholipid species is not yet complete, the evidence available now indicates that the 16:1 *trans*-fatty acid is concentrated mainly in phosphatidyl glycerol. This finding is relevant to the recent work of NICHOLS[6], who suggested that lecithin and phosphatidyl ethanolamine are present mainly in mitochondria and nuclei, whereas phosphatidyl glycerol is specifically concentrated in the chloroplast.

The positional distribution of the fatty acids was investigated after a complete hydrolysis of phosphatidyl glycerol with phospholipase A (EC 3.1.1.4) from *Crotalus adamanteus*[12]. By virtue of the positional specificity of this enzyme the Δ^3-*trans*-hexadecenoic acid appeared to be located exclusively at the 2-position of phosphatidyl glycerol (Table). It is intriguing that a predominant part of linolenic acid occupies the 1-position. Hence, the distribution of monoenoic and polyenoic fatty acid constituents in phosphatidyl glycerol differs significantly from the distribution usually found in several other phospholipid types from the animal and plant kingdom.

Zusammenfassung. Der Gehalt an Δ^3-*trans*-Hexadecensäure im Phosphatidylglycerol aus grünen Spinatblättern (*Spinacea oleracea*) erweist sich als auffallend hoch. Die enzymatische Hydrolyse zeigt die C_{16}-Monoensäure mit der β-Stelle des Phosphatids verknüpft.

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Alternative Pathways of Glucose Metabolism in Developing Chick Brain[1]

Introduction. A widely used method of comparing the relative amounts of glucose metabolized by the two major known pathways, in different tissues, is based on the differential utilization of specifically labelled glucose. C-6 of the glucose molecule is converted to carbon dioxide by glycolysis and the tricarboxylic cycle. C-1 of the glucose molecule is converted to CO_2 both by this pathway and by the hexose-monophosphate shunt[2,3]. This method was used in previous investigations in this laboratory concerning the relative importance of the two pathways in various tissues[4–6]. Study was now extended to embryonic chick brain with the purpose of comparing the relative rates of the glycolytic and hexosemonophosphate pathways at various developmental stages.

Material and methods. Embryos were removed from fertile eggs incubated for 6 to 21 days at 37°C and staged according to the HAMBURGER and HAMILTON[7] stage

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