

than lens and so destroy the substances its presence is intended to preserve.

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<sup>1</sup> Najjar, V. A., Bersworth Chemical Co. Booklet (1952).

<sup>2</sup> Krimsky, I., and Racker, E., *J. Biol. Chem.*, **198**, 721 (1952).

<sup>3</sup> Grunert, R. R., and Phillips, P. H., *Arch. Biochem.*, **30**, 217 (1951).

<sup>4</sup> Woodward, G. E., *J. Biol. Chem.*, **109**, 1 (1935).

<sup>5</sup> Dohan, J. S., and Woodward, G. E., *J. Biol. Chem.*, **129**, 393 (1939).

### Lipid Nomenclature

CONSIDERABLE confusion exists in the naming of compounds of the class now most commonly referred to as 'lipids'. It is indeed not yet agreed that the latter shall be the generic name, and the terms lipins, lipines, lipides and lipoids are in current use, together with derivative forms, galactolipins, etc., used to designate the complex members of the class. A profusion of empirical nomenclature has developed, particularly in the complex lipid field, often referring to compounds of dubious existence, and terms are frequently applied without distinction both to a single compound and to a crude 'fraction' containing this compound or possessing similar solubility properties. Several authors have directed attention to this state of affairs<sup>1,2</sup>, and have made proposals for rectifying some of the anomalies.

Folch-Pi and Sperry<sup>1</sup> have suggested the replacement of the older system of classification, in which the phosphorus-containing lipids or phosphatides were divided into the monoaminophosphatides (lecithin and kephalin) and diaminophosphatides (sphingomyelins), by a division into phosphoglycerides, phosphosphingosides and phosphoinositides. The former use of the term 'phosphatide' to cover all the phosphorus-containing lipids is rejected in favour of a system in which the diacylglycerophosphoryl radical is termed 'phosphatidyl', 'lecithin' becoming 'phosphatidyl choline' and the 'kephalins' 'phosphatidyl serine', 'phosphatidyl ethanolamine', etc. This classification is very convenient and has won ready acceptance by many workers. The diacylglycerophosphates are already referred to as 'phosphatidic acids', which is in conformity with the proposed usage, although the former term seems preferable as being definitive and is not too cumbersome. 'Phosphoglycerides' is not very satisfactory as a name for the group, suggesting the 'phosphatidic acids' rather than their esters with hydroxyamino compounds. It is therefore suggested that it is replaced by 'phosphoglyceratids'. In view of the recent synthesis<sup>3</sup> of lipids in which glycol replaces glycerol in a lecithin type of structure, 'phosphoglycolatids' or 'phospholatids' is suggested as a suitable term, 'phospholatidyl choline', for example, designating an acylglycolphosphorylcholine. The retention of 'ol' in the latter term involves a minor inconsistency with the phosphoglyceratids, in which the 'ol' of glycerol is omitted. However, the alternative, 'phosphoglycatids', might involve confusion with sugar derivatives.

The term 'phosphosphingoside' proposed to replace sphingomyelin is very misleading, since the '-oside' termination suggests a glycoside and would lead to confusion with the sphingoglycosides (*q.v.*). An alternative term which would indicate the connexion with the phosphoglyceratids would be 'phosphosphingatids', although objection could be justifiably

Older terms	Alternative proposals in the literature	Present proposals
Lipid, lipide, lipin, lipine and derivatives Monoamino-phosphatides Lecithin, kephalin	— Phosphoglycerides Phosphatidyl choline Phosphatidyl ethanolamine, etc. Glycollecithins (ref. 3)	Lipid and derivatives, for example, phospholipid, galactolipid, etc. <i>Phosphoglyceratids</i> Phosphoglyceratidyl choline or phosphatidyl choline Phosphoglyceratidyl ethanolamine, etc. Phosphoglycolatids or phospholatids Phosphoglycolatidyl choline or phospholatidyl choline, etc.
—	—	Phosphosphingamides or phosphosphingamatides Phosphingamidyl choline or phosphosphingamatidyl choline, etc. Sphingolipids Sphingoglycosides
Diamino-phosphatides Sphingomyelins	Phosphosphingosides Sphingolipides (ref. 4) Glycosphingosides Sphingoglycosides	Phosphosphingamides or phosphosphingamatides Phosphingamidyl choline or phosphosphingamatidyl choline, etc. Sphingolipids Sphingoglycosides
Cerebrosides	—	—
Ceramides	—	Sphingamides

raised that no O-acyl group is present. It might therefore be more desirable to use a term such as 'phosphosphingamides', leading to 'phosphosphingamidyl choline' for the sphingomyelins already known, or, for a given individual, 'N-lignoceryl-phosphosphingamidyl choline' and allowing scope for extension as compounds of this structure, but involving other bases, are discovered or synthesized. However, the objection raised to 'phosphoglyceride' would apply to this term, and 'phosphosphingamatide' might overcome this point.

Lignocerylsphingosine and similar sphingosine amides at present styled 'ceramides' might be more suitably named 'sphingamides'.

Since the structures of the compounds termed 'phosphoinositides' by Folch-Pi and Sperry have not been established with any certainty, any attempt to include these in an analogous terminology would be premature.

Carter and Celmer (*loc. cit.*) prefer the term 'sphingoglycosides' to 'glycosphingosides', which was proposed by Folch-Pi and Sperry to replace 'cerebrosides'; and since, as the former authors point out, the compounds are glycosides, the point seems well taken.

It would seem to be extremely desirable for the appropriate International Union to go into the whole question of lipid nomenclature, in order that a generally acceptable terminology might be adopted.

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<sup>1</sup> Folch-Pi, J., and Sperry, W. M., "Ann. Rev. Biochem.", **17**, 147 (1948).

<sup>2</sup> Celmer, W. D., and Carter, H. E., *Physiol. Rev.*, **32**, 167 (1952).

<sup>3</sup> Baer, E., *J. Amer. Chem. Soc.*, **75**, 622 (footnote) (1953).

<sup>4</sup> Carter, H. E., Haines, W. J., Ledyard, W. E., and Norris, W. P. *J. Biol. Chem.*, **169**, 77 (1947).

### Sex Ratio in Spawning Populations of *Lampetra planeri*

THE question of the sex ratio in lampreys is of some interest in view of the occurrence of hermaphrodite gonads in the ammocoete larva; but there are wide divergencies in the figures given by previous workers in Europe and North America.

My own observations on *L. planeri* show that the ratio varies in different streams and even from year