

LETTERS TO THE EDITORS

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A Notation for Organic Compounds

DR. A. R. RICHARDS¹ proposes a form of 'chemical shorthand' to designate the commoner hydrocarbons and their simple compounds. This he claims may avoid the practice of coining names such as 'triptane' for '2,3,3-trimethylbutane'; in practice it will not have this effect. Once a substance leaves the laboratory and enters the plant, it *must* have a short distinctive title by which all and sundry can refer to it; and in 'triptane' such a word has been found. What we must most sedulously avoid is the unwarrantable intrusion of such coined names into systematic nomenclature. G. C. Foster, so far back as 1865², pointed out that all sciences have two distinct requirements of nomenclature—a convenient *general* language and a systematic or 'legal' language. The former serves for the ordinary everyday transactions of science and manufacture and will, "in the main, take care of itself; and at any given period it usually contains a large admixture of terms—once technical, but now no longer used for purposes of accuracy—which, like fossils in a rock, tell of the successive changes by which the existing state of things has been brought about". The strictly legal or premeditated language of organic chemistry is for cataloguing and identifying substances with absolute precision and expedition.

At present we have a choice in the exact delineation of an organic structure between an ideograph (the structural formula) and a so-called 'systematic' name. The ideograph is space-consuming, has no sound equivalent and cannot be indexed in list form, since a series of structural formulae has no intrinsic basis of ordered arrangement; on the other hand, it is immediately intelligible to the eye and easily remembered. 'Systematic' names are cumbersome, often ambiguous, very long to print, and have never attained more than a measure of popularity with practical chemists. They impose an intolerable burden on the memory, being related to a large group of 'trivially' named nuclei, many of which are virtually unknown. Further, they are often unpronounceable owing to the use of various types of brackets, subscripts, dashes and the like which not only complicate printing but also have no simple vocal equivalent [for example, pronounce the following: Spiro [3-naphtho [1,2] triazole-2,2'-3'-ox-2'-azatricyclo [3.3.3] nona-1'(8'),5'(9')6'-triene] and then jot down its structure (Ring Index No. 3179)].

Most chemists actually remember the structure or ideograph and associate the idea of a name; after a time many structures and names become so closely associated as to be almost indissoluble in the memory; but such are only a small fraction of those ordinarily used, while the rules and exceptions of systematic nomenclature are tedious both to learn and to apply.

Ordinary systematic nomenclature has failed to give that degree of precision and ease of reference required by modern developments of the science, and I have developed during the past few years a system of ciphering for organic compounds which provides a method of reference and classification capable of providing a unique cipher for every structure. Such ciphers have a logical system of enumeration, use only the capital letters, 0, and the Arabic numerals,

without subscripts, brackets or dashes and are, moreover, capable of being 'interpreted' on a punched card system; the 'sorting' of cards into categories can be readily accomplished and a form of mechanical indexing and reference is thus achieved. In addition, the machine can automatically compute, from the card, the empirical formula of the compound.

Space does not permit the discussion of details of this system, which will be published elsewhere shortly, but my purpose in writing will be served if attention is directed to (a) the inevitability of short or trivial names for substances in common use; (b) the undesirability of allowing such names further to complicate our systematic nomenclature; (c) the desirability of any universally adopted cipher system being complete, international and mathematically adaptable.

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¹ *Nature*, 153, 715 (1944).

² *Phil. Mag.*, 29 (April 1865).

A Silicified Member of the Cyclanthaceæ from the Tertiary of the Deccan

NEW discoveries of fossil plants, while frequently solving problems of geographical distribution, often throw up fresh problems that baffle solution. Recent work on the silicified flora of the Deccan Intertrappean Series (which with all deference to the 'official' view of the Geological Survey of India we regard as Early Tertiary and not Late Cretaceous¹) has brought to light genera which are either identical or very closely related to living types now confined to parts of South America. A year ago, one of us reported the occurrence in these beds of well-preserved silicified sporocarps essentially of the *Regnellidium* type, which he referred to a new genus, *Rodeites*², closely allied to the Brazilian water-fern *R. diphyllum*. We now record the occurrence in the same locality (Mohgaon Kalan, in the Central Provinces) of a new silicified member of the Cyclanthaceæ, a family now living only in tropical America. Of this family we had hitherto no definite fossil record. The leaf-impressions from the Eocene of Sézanne, which Saporta³ referred to a new genus, *Ludoviopsis*, may equally probably belong to palms.

We recently suggested⁴ that the silicified stem from the Deccan, described by K. P. Rode in 1933 under the name *Palmoxylon Sahnii*⁵, is probably not a true palm but an extinct member of the Cyclanthaceæ. A detailed anatomical examination of the vegetative organs of this plant, of which two large specimens were found by one of us at the same locality in 1941, has now proved that our surmise was correct. In its main anatomical features the fossil shows a close resemblance to *Cyclanthus*. Thus the root structure is very similar to that of the modern genus; in both forms the pith is fibrous and there are ten or more protoxylem groups. The fibrovascular bundles of the stem, which Rode described in some detail, also resemble those of *Cyclanthus* in the crescentic arrangement of the xylem vessels and in the peculiar compound (? branched) nature of the bundles. As in *Cyclanthus*, too, the leaf sheaths contain a row of large secretory canals.