REVIEW

MIOSPORES IN THE COAL SEAMS OF THE CARBONIFEROUS OF GREAT BRITAIN by A. H. V. Smith & M. A. Butterworth (Special Papers in Palaeontology No. 1 — The Palaeontological Association, London, June 1967)

THIS special paper is a comprehensive work, running into over 300 pages with 72 text-figures and 27 plates, dealing with the small spores contained in British coals of Carboniferous age and their distribution in time and space.

The introductory chapters give a brief yet complete account of the history of coal spore studies in Great Britain including spore nomenclature, followed by an outline of Carboniferous stratigraphy and how delineation of miospore assemblage boundaries has been effected.

The treatise includes a detailed account of the distribution of Miospore Assemblage I-XI in the British coalfields and also of selected spores in the Coal Measures. These accounts are amply supported by text-figures giving details of geological succession and the frequencies of selected miospores in the coal seams of various coalfields. This is followed by a summary of the characteristics of the various Assemblages I-XI also named after some spore species, e.g. *Grumosisporites verrucosus* Assemblage I, *Diatomozonotriletes saetosus* Assemblage II, *Rotaspora knoxi* Assemblage III, *Crassispora kosankei* Assemblage IV, *Densosporites annulatus* Assemblage V, *Radiizonates aligerans* Assemblage VI, *Schulzospora rara* Assemblage VII, *Dictyotriletes bireticulatus* Assemblage VIII, *Vestispora magna* Assemblage IX, *Torispora securis* Assemblage X and *Thymospora obscura* Assemblage XI. The authors have put the dividing lines between the Assemblages at the levels of the first appearances of the stratigraphically younger species and note that there exists little similarity between the Miospore Assemblage boundaries described by them and those defined by various authors on the distribution of plant macrofossils.

A very significant chapter deals with the application of miospores to stratigraphy and the correlation of coal seams. The principles and the associated aspects of the subject have been lucidly enunciated in detail. Of special interest to coal palynologists is the discussion of the ' effect of environment on the miospore floras ' and the techniques of correlation by spores.

The system of classification used by the authors is based on that proposed by Potonié and Kremp (1954) and subsequently expanded by Potonié (1956, 1958, 1960), and Corsin *et al.* (1962), but for some changes in the classification of Sporites revised on the basis of the scheme of Dettmann (1963). This revised scheme is not comprehensive and primarily adapted to accommodate the Carboniferous Sporites described in the paper. This is one out of the few independent efforts recently put in to improve upon Potonié & Kremp's basic, morphographical approach.

In the descriptive part, well illustrated descriptions of 204 Species in 63 genera, have been given. One new genus, *Grumosisporites* and six new species have been instituted. The frequencies and stratigraphic ranges of each species have also been included.

This special paper is the first, exhaustive treatise on the miospores from coal deposits of a country containing information gathered by a team of palynologist over a number of years. To palynologists working on Upper Palaeozoic deposits of Europe and North America, this work is indispensible. For others it is an example worthy of emulation. The authors as well as the Palaeontological Association have done a creditable job. The printing is excellent and errors are few (check my initials on pp. 312, 319).

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THE SYSTEMATICS AND DISTRIBUTION OF PERMIAN MIOSPORES by G. F. Hart (Witwatersrand University Press, Johannesberg 1965)

THE book includes a synthesis of the information on Permian Palynology available till 1963 in general. The subject matter has been treated under four major heads. The introductory chapter includes the author's views on morphology of miospores, the miospore species and the Fundamentals of Miospore Systematics. In the second chapter

while emphasizing the desirability of a uniform and comprehensive classification of dispersed spores, the author has reviewed the history of the more important morphographical groups of miospores deposited during the Permian times. The third chapter gives diagnoses and descriptions of the genera and species of Permian spores. The last chapter deals with the distribution of miospores in Permian time and space.

The get-up of the publication is impressive but the contents are of limited and for the most part of doubtful utility. A common feature of the treatise is the independent or rather unusual outlook taken by the author on many of the scientific aspects. In the introductory chapter he has coined his own descriptive terms e.g. *Baculli* (for *Bacula*), *Pilli* (for *Pila*), *Verruci* (for *verrucae*), *Seti* (for *Setae*) etc., which are neither philologically correct nor in accordance with common usage among palynologists. While dealing with ' the Fundamentals of Miospore Systematics ', the author has purported to have adopted Potonié's classification for the Permian spores. Here too, he has exhibited his independence in approach, if nothing else, by reversing the order in which Pollenites and Sporites have been treated by Potonié as well as all others who follow his system.

Dr. Hart has often claimed to have been guided by the approach of the International Commission on Palaeozoic Microfloras (I.C.P.M.) i.e. Commission Internationale du Microflore du Palaeozoique (C.I.M.P.) but he has always referred to this organization as I.C.M.P. which is an abbreviation of neither of the correct names. On p. 16, he has even reduced the status of C.I.M.P. from a Commission to a Committee.

In the second chapter dealing with the fundamentals, Dr. Hart has again taken an independent approach on the relative importance of ' type ' and ' descriptions '. He expresses his mind by saying, " Many of the previous diagnoses and descriptions of permian species of miospores were not sufficiently commented upon by the originating author as to allow distinctions with other species. In such cases, unless I have examined holotype, paratype, stratotype, or definite material named by the originating author, the written description has been taken as containing the characteristics of the type; not the photograph or diagram. This is necessary because, in some cases, the description does not fit that apparent from the photograph or diagram. Also in some holotypes that have been studied (? *by whom and where*), the drawing of the type bears no relationship at all to the actual type ". This approach is almost contrary to the prevalent practice. Actually good photographs or faithful drawings of types are more trustworthy than the descriptions. They may be able to tell most to an intelligent palynologist. If the description differs from what the photographs and diagrams suggest, it is the latter which is more reliable. The illustrations of Reinsch were unambiguous while his descriptions were incorrect. Even the worst ever diagrams of Berry (1937) for *Densosporites* were not contrary to his scanty descriptions. In my opinion this approach of Dr. Hart has been arbitrary. It is the responsibility of a monographer to find out the truth rather than arbitrarily foster an approach which may lead to errors. Unfortunately his treatment of Permian Systematics does suffer from this approach. Long synonymies have been suggested without convincing scientific evidence in support of such stipulations. To make matters worse, all the diagnoses of genera and species whether or not emended have been reworded. This practice is hardly permissible.

For the Systematics of Striatiti, Dr. Hart has placed reliance on the size relationship of the central body with the saccus height which he expresses, presumably, as haploxylonoid and diploxylonoid conditions, the number of ribs on the central body and the width of the distal zone. Unfortunately, he did not make any scientific study of these variations to prove their validity as reliable morphographic characters for the separation of genera and species (cf. BHARADWAJ & SALUJHA, 1964). Even otherwise, the way Dr. Hart's diagnoses of various genera and species are intermerging in respect of these characters goes to prove that they are unreliable and any Systematics based on them will be questionable. The taxonomic delimitations suggested by Dr. Hart are confusing and one wonders how can any body else but Dr. Hart, refer ones specimens to his species and genera without a shadow of doubt. The differential diagnoses or comparisons given for the species and genera are mostly inadequate and vague.

Among the many cases of unscientific approach in the systematics of Sporae dispersae the most striking is that of *Pityo-*

sporites Sew. Dr. Hart accepts the emendation of this genus by Manum (1960). But like everywhere else, he rewords Manum's diagnosis in his own way. Over and above this, he introduces arbitrarily new features, which were either not mentioned by Manum, e.g. the occurrence of diploxylonoid condition in *Pityosporites*, or, are contrary to what has been mentioned by Manum, e.g. according to Manum, " ventrally they (sacci) are separated by a more or less narrow furrow " while Hart states " without a transverse or longitudinal sulcus on the central body ". Taking diploxylonoid condition as an established fact in *Pityosporites*, Dr. Hart has reduced at least two well defined genera viz., *Platysaccus* and *Cuneatisporites* to synonyms of *Pityosporites* besides others. It would have been much better if Dr. Hart had restricted the use of *Pityosporites* only for laterally compressed disaccates, apparently of the same organization as in abietinian pollen grains.

Cordaitina Samoilovich (1953) is a monosaccate genus, which has been variously understood. Samoilovich holds that *Cordaitina* has a saccus covering the central body on all sides. The genoholotype is a specimen illustrated by Luber and Valts (1941). However, Dr. Hart has emended *Cordaitina* in his work attributing it to have the C.B. free from saccus on both the polar faces. He does not state to have examined the genoholotype or the genotype material, hence one wonders about the truth in his contention for emendation. This could be avoided if the author had only included a few photographs of the holotype and other specimens from the type material to substantiate his view.

The book has quite a few mistakes (non-printing) in the names of taxa, e.g. *Potoniesporites*, for *Potonieisporites*, *Pilaspora* for *Pilasporites*, *Eupunctatisporites* for *Eupunctisporites*, *Reinchospora* for *Reinschospora*, *Microbaculatispora* for *Microbaculispora* and *Paraspora* for *Parasporites* (p. 20). On p. 153 Thomson has been cited as Thomas. There are also some inconsistencies in the citation of year in the text for the works of various authors, e.g. Bharadwaj 1962 has been cited as 1961 or 1962 or 1963 and Jansonius 1962 also has been cited as 1962 or 1963 at various places. There are a few ommissions, e.g. out of Bharadwaj (1962) the genus *Microfoveolatispora* has been omitted. There are also a few other minor mistakes such as the use of *Microbaculispora villosus* which should be *M. villosa*; the type species of *Pakhapites* has been named as *Pakhacolpites fasciolatus* which should be *Pakhapites fasciolatus*.

In spite of all the shortcomings, which had to be mentioned here to caution unwary palynologists lest they perpetuate them in their works, the publication is valuable in so far as it has brought together much of the scattered information on Permian palynology. In this connection, worthy of special mention is the inclusion of Russian contributions which were often ignored by many of us due to non-availability of literature or technical and language difficulties. However, the utility of the latter would have been further enhanced had the author incorporated illustrated, faithful descriptions of as many of the types of Russian genera and species as he could examine. We are still not clear in our conception about many of the numerous genera created by Russian palynologists which are now considered by Dr. Hart as synonyms of a few older genera.

The book is copiously illustrated with schematic sketches (not to scale) which more or less represent the features correctly. The range charts for distribution of species and genera are of limited utility as the quantitative representation of taxa in various horizons and lands has not been included. The tables giving the number of species occurring in various horizons of the Permian in Northern, Southern hemispheres and India are hardly of any value until these data could be based on scientifically standardized species concept for miospores.

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