which also goes to Madagascar. Australia has two other species, *P. regia* or *melanorhynchus,* with black bill and feet, and *P. flaυipes,* in which those parts are yellow. The very beautiful and wholly different *P. ajaja* is the Roseate Spoonbill of America, and is the only one found on that continent, the tropical or juxta-tropical parts of which it inhabits. The rich pink, deepening in some parts into crimson, of nearly all its plumage, together with the yellowish green of its bare head and its lake-coloured legs, sufficiently marks this bird; but all the other species are almost wholly clothed in pure white, though the English has, when adult, a fine buff pectoral band, and the spoon-shaped expanse of its bill is yellow, contrasting with the black of the compressed and basal portion. Its legs are also black. In the breeding season, a pendent tuft of white plumes further ornaments the head of both sexes, but is longest in the male. The young of the year have the primary quills dark-coloured.

The Spoonbills form a natural group, Plataleinae, allied to the Ibididae, and somewhat more distantly to the Storks (see Stork). They breed in societies, not only of their own kind, but in company with Herons, either on trees or in reed-beds, making large nests in which are commonly laid four eggs—white, speckled, streaked or blotched, but never very closely, with light red. Such breeding stations have been several times described, as for instance by P. L. Sclater and W. A. Forbes *(Ibis,* 1877, p. 412), and H. Seebohm *(Zoologist,* 1880, p. 457), while a view of another has been given by H. Schlegel (*Vög*. *Nederland,* taf. xvii.). (A. N.)

**SPORADES** (Gr. *∑πoραδες*, from *σπείρειv,* to sow), the islands scattered about the Greek Archipelago, as distinguished from the Cyclades, which are grouped round Delos, and from the islands attached, as it were, to the mainlands of Europe and Asia. Ancient and modern writers differ as to the list of the Sporades (see Bursian, *Griechenland,* ii. 348 seq.). The Doric Sporades —Melos, Pholegandros, Sikinos, Thera, Anaphe, Astropalia and Cos—were by some considered a southern cluster of the Cyclades. In modem times the name Sporades is more especially applied to two groups—the northern Sporades, which lie north-east of Negropont (Euboea), Skiathos, Skopelos and Ikos being included in the department of Magnesia and Scyros in that of Euboea; and the southern Sporades, lying off the south-west of Asia Minor, being included in the Turkish vilayet of the “ Islands of the White Sea." The northern, which have altogether an area of 180 sq. m. and a population of 12,250(1896), comprise Skiathos (pop. 2790), Ikos (pop. 653), Skopelos (pop. 5295), Pelagonisi, Giura, Pipari and Scyros (pop. 3512), with the adjacent islets. Skiathos is a beautifully wooded and pictur­esque island; the town stands on a declivity surrounding an excellent harbour. The larger island of Skopelos is also well wooded. Almost every householder in both islands is the owner, joint owner or skipper of a sailing ship. The southern Sporades are as follows: Icaria, Patmos, Leros, Calymnus, Astropalia (Astypalaea or Stampalia), Cos (Stanko), Nisyros, Tilos or Episcopi, Syme, Khalki, Rhodes, Crete and many smaller isles. Icaria (pop. about 8000) derives its name from the legend of Icarus. The forests which it once possessed have been destroyed by the inhabitants for the manufacture of charcoal. Leros (pop. about 3000) was in ancient times a seat of the worship of Artemis. Calymnus (pop. about 7000) was once covered by forests—(Ovid, *A.A.* ii. 81, “ silvis umbrosa Calymne” ), which have disappeared. Nisyros (pop. about 2500) possesses hot sulphur springs.

**SPOROZOA,** a large and most important section of the Proto­zoa, all the members of which are exclusively parasitic in habitat. They are of extremely widespread occurrence; there is hardly one of the chief classes of animals which does not furnish hosts for these parasites, scarcely one of the common tissues or organs of the Metazoan body which may not be liable to infection. Sporozoa differ greatly as regards the effects which they produce upon their hosts. In many, perhaps in most, cases the general health of the infected animal seems to be unimpaired, even though the parasites may be fairly abundant. Some, however, give rise to dangerous or fatal diseases, while others may cause ravaging epidemics; instances of these are given under the various orders.

Correlated with the mode of life are the two features character­istic of all Sporozoa: *(a)* They absorb only fluid nutriment, osmotically, and so lack any organs for ingesting and digesting solid food; and (δ) they reproduce by sporulation, *i.e.* the for­mation of minute germs, which are in most instances very numerous and are often enclosed in firm protective envelopes or cases, each case with its contents forming a *spore.* In addition, the great majority have also another method of reproduction, for increasing the number of the parasites in any individual host ; this is distinguished as multiplicative or endogenous repro­duction, from the propagative or exogenous method (by means of the resistant spores), which serves for the infection of fresh hosts and secures the dissemination and survival of the species. Further, most if not all forms of Sporozoa undergo sexual conjugation at some period or other of the life-cycle.

Beyond this, however, it is impossible to generalize. In response to the exceeding diversity of habitat and of the con­ditions of life, the parasites exhibit manifold and widely-different types of form, organization and life-history. The recognition of this fact is expressed, at the present day, by the division of the Sporozoa into several well-defined orders, which are grouped in two main divisions, each containing more or less closely related forms. One of these groups consists of the Gregarines, Coccidia and Haemosporidia *(qq.v.).* The other comprises the Myxosporidia, Actinomyxidia, Sarcosporidia and Haplosporidia, the parasites included in the last named order being of compara­tively simple structure, and probably near the base of this section. There are, in addition, various other forms (Sero- and Exo-sporidia), also primitive in character, but which are as yet too insufficiently known for it to be certain whether they are of distinct ordinal rank, or should be placed with the Haplosporidia.

The nomenclature assigned to these two principal divisions of the Sporozoa by different writers has varied according to the particular character on which they have primarily based the arrangement. Of late years, the terms Telosporidia and Neosporidia, proposed by F. Schaudinn (1900), have been most in favour. In the Telosporidia (comprising the Gregarines, Coccidia and Haemosporidia), sporulation does not begin until the close of the vegetative or trophic period, *i.e.* until growth has ceased; in the Neosporidia (including the remaining orders) growth and sporulation go on coincidently. Recently, however, considerable doubt has been thrown upon the general occurrence of this latter condition in certain Myxosporidia *(Microsporidia) ;* and the present writer adopts as preferable, therefore, the terms *Ectospora* and *Endospora (qq.v.),* invented by E. Metschnikoff and made use of by F. Mesnil (1899), which indicate a universal distinction between the two groups in their manner of sporula­tion. This distinction is probably the most fundamental one, and itself supports a conclusion which is, on other grounds, becoming more and more likely, namely, that these two divisions are not related phylogenetically; but have, on the contrary, a radically different origin. In other words, under the heading Sporozoa, as at present used, are included two entirely inde­pendent series of Protozoan parasites; the general resemblances which these exhibit are due to convergence brought about by their specialized mode of life.

The most recent and comprehensive account of the group is that by E. A. Minchin (in Lankester’s *Treatise on Zoology,* pt. i., London, 1903), to which the present writer is much indebted; another useful treatise is that of F. Doflein, *Die Protozoen als Parasiten u. Krank-heitserreger* (G. Fischer, Jena, 1901). Earlier accounts are those of Μ. Lühe, *Ergebnisse der neuren Sporozoenforschung* (Jena, 1900); Wasielewski, *Sporozoenkunde* (Jena, 1896); Y. Delage and E. Hérouard in *Traité de zoologie concrete,* pt i., Paris, 1896); E. R. Lankester, art. “ Protozoa ” in *Ency. Brit.* 9th ed. (1886), and O. Bütschli in Bronn’s *Klassen u. Ordnungen des Thierreichs,* I. i. (1882). There is a systematic enumeration of the group by A. Labbe in *Das Thierreich,* 5. (Berlin, 1899); and the classification and phylogeny are considered by E. Mesnil *(Soc. Biol.,* vol. jub. p. 258, Paris, 1899), and by H. Crawley in *Amer. Nat.* (1905), xxxix. 607.

(H. Μ. Wo.)