capable of change of form, and probably in most cases of active penetration into the intestinal epithelial cells of a new host (Fig. 1h), which cells they leave after having attained the adult form (Fig. 1k). The above is a sketch of the life-history of a typical intestinal Gregarine from an insect; to the same order, however, there also belong forms, which unlike the preceding have a long intracellular life, and a short free life, and it will be necessary to return specially to these as they are the forms most interesting in human pathology.

2. The second order, Sarcosporidia, receives its name from the circumstance that the organisms in question are generally found in the muscular tissues of vertebrates. They are the tubes of Miescher or Rainey, which have long been known (Fig 2a) from the flesh of the hog, sheep and other animals, but which may be present in considerable numbers without apparently affecting the health of their host. When present in large numbers, however, they may give rise to various symptoms, according to the group of muscles—lumbar, diaphragmatic or cardiac—most involved. It has been suggested by Pfeiffer that the acute Polymyositis described by Unverricht and others is due to invasion by Sarcosporidia, but this has not been definitely proved. The tubes grow at the expense of the muscular fibres, and present within the porous cuticle which limits them, globular cysts in different stages of development, the ripe ones of which are full of crescentic bodies, which recall the crescents of the Gregarines, and are probably the means by which the parasites spread to other fibres. The Sarcosporidia are not confined to muscle-fibre, for they occur in the connective-tissue of the œsophagus of the sheep, forming there tumours of considerable size, which may entail various pathological consequences.

3. The Myxosporidia in their adult condition have the least regularity of form of any of the Sporozoa (Fig. 2 b.) They are found on the skin and mucous membranes of aquatic vertebrates, and like the last group are generally observed to be full of spores. These are unlike those of preceding groups, in that they are provided with projectile threads (Fig. 2 b & c) possibly a provision for attachment to a new host.

4. The Microsporidia, finally, include extremely minute Sporozoa, the spores of which (Fig 2 d) are so small that they have been taken for bacteria. They occur as parasites of the tissue elements of insects, and in the form of the pebrine of the silk-worm have led to enormous losses in silk-culture in Europe. M. de Quatrefages calculated that in the first thirteen years after the outbreak of pebrine, France lost two hundred million dollars from the ravages of this sporozoon. They are not confined to any particular kind of cell but invade and destroy all without exception.

We must now return to those forms which belong to the first order, but which differ from the type described, in that their life is chiefly an intracellular parasitic life, a short free or wandering stage, however, permitting the young forms to invade new cells or new hosts. They are generally known as Coccidia, and like the Sarcosporidia and Microsporidia are true cell-parasites. The best known is *Coccidium oviforme* from the liver of the rabbit. It occurs in caseous nodules and cysts of the liver, which are full of the parasites in their encapsuled stage (so called psorosperms, Fig. 2 e.) Sporulation does not occur within the host, but has been studied outside, and recognised to result in the formation of two crescentic germs within each of four spores. It is supposed that the cysts, which have been voided from the intestine of one infected animal, may after sporulation be introduced with the food into the intestine of a new host, the crescentic germs being eventually freed and thus ready to penetrate the epithelial cells of the bile-ducts (Fig. 2, e 5) the contents of which they devour before again undergoing encystation.

Several cases in which man has been attacked by the same parasite are recorded—a particularly interesting one is that described by Gubler, who diagnosed hydatid tumours of the liver. The patient died, and some twenty cysts full of coccidia were found, one six inches in diameter! There is little doubt but that cysts of this nature, full of caseous material, have often been misinterpreted in the past, and closer attention in the future may establish that such psorospermosis of the liver is not so rare as has been supposed.

A large number of similar forms are known in other vertebrates and invertebrates attacking the cells of the intestinal tract and its append-