

suffice here to say, that it will there be found to bear a relation to the body and the whole system different from that which has usually been supposed or admitted. When we look at the cellular tissue of the lower branches of the animal kingdom loosely strung together, where we may see every cell of a muscle dilate and contract for itself; where, in the younger but free stages of the same, these cells hardly touch each other, and yet dilate and contract; where the whole animal moves from place to place by the help of these selfsame active vesicles; or where, in the simplest phases of organic structures, we may actually count the number of cells of which the body is composed, as the animal flutters and quivers while falling to pieces before our eyes;—when we see all these phenomena, we need not fear to adopt views contrary to a sound physiology in advocating the animality of the yolk,¹ notwithstanding the loose connection of its

¹ We need only refer to the researches of BISOHOFF, upon the Embryology of Mammals (*Entwicklungsgeschichte des Kaninchen-Eies*, q. p. 83: p. 93, pl. 8, fig. 40 D, and pl. 16) — BAER, upon Birds (*Ueber Entwicklungsgeschichte der Thiere*, q. p. 67: Erster Theil, p. 67, pl. 1, 2, p¹, r¹, t, u, s¹, q¹) — REMAK, upon Batrachians (*Untersuchungen über die Entwicklung der Wirbelthiere*, q. p. 83: p. 81, pl. 10, fig. 1-5, pl. 12, fig. 1-8) — VOGT, upon Fishes (*Embryologie des Salmones*, in Agassiz *Histoire naturelle des Poissons d'eau douce de l'Europe centrale*, q. p. 81: vol. 1, p. 38, pl. 5, fig. 116-120) — KÜLLIKER and ZADDACH, upon Insects (*Külliker, Observationes de prima Insectorum Genesi*, q. p. 80: p. 3, sect. 4, pl. 1, fig. ii., 1, 3, p. 12, sect. 18, pl. 2, fig. ii., 1, 3; Zaddach, *Untersuchungen über die Entwicklung und den Bau der Gliederthiere*, q. p. 80: I. Heft., p. 3 and 4, sect. 2 and 3, pl. 1, fig. 2, 3, and 4, C, fig. 5, K) — RATNKE, upon Crustacea (*Zur Morphologie, Reishemerkenungen*, q. p. 79: p. 74 and 75, fig. 9, 10, 11) — MILNE-EDWARDS, upon Annelides (*Recherches anat. et zool.*, q. p. 92: première partie, p. 34-36, fig. 47-50) — KÜLLIKER, upon Cephalopoda (*Entwicklungsgeschichte der Cephalopoden*, q. p. 74: p. 165, pl. vi., fig. lx.-lxiii.) — GEGENBAUER and LEYDIG, upon Gasteropoda (Leydig, in *Zeitschrift für Wissenschaftliche Zoologie*, q. p. 73: p. 130, pl. xi. fig. 5-8; Gegenbauer *Untersuchungen über Pteropoden und Heteropoden*, q. p. 74: p. 66, pl. iii., fig. 9-13, and p. 179, pl. viii., fig. 3-9) —

QUATREFAGES, upon Acephala (*Annales des Sciences Naturelles*, 1839, tome xi., p. 208-215, pl. 9, fig. 16-26) — DERNÈS, upon Echinodermata (*Annales des Sc. Nat.*, 1847, tome 8, p. 90-92, pl. 5, fig. 6-14) — SIENOLD, upon Medusa (*Neueste Schriften der Naturforschenden Gesellschaft in Danzig*, 1839, p. 22-29, sect. 14-28, pl. 1, fig. 12-19), — and a host of other authors, quoted in connection with a former section, (see p. 68-87,) to furnish abundant evidence of the truly internal position of the yolk. This part of the egg is, from the beginning, embodied within the extended layers of the embryo, "the germinal layer." In some instances it even assumes very early an organic form, (see Remak, loc. cit., pl. 10, fig. 19-23, dk, and dk, pl. 12, fig. 10, dk; Dr. J. Wyman on the Surinam Toad, *Sill. Journ.*, May, 1854, p. 371, fig. 3; Leydig, loc. cit., fig. 8-12, b, c, d, g; Milne-Edwards, loc. cit., p. 24-26, pl. 1, fig. 8-11.) although its components are quite loosely attached to each other. It may be said that the extension of the germinal layer around the whole yolk mass does not sufficiently imply the identity of the latter with the rest of the embryo; yet, when we see this same mass take the form of an important organ, especially well marked in the Surinam Toad, (*Pipa americana*.) and so ably described in Wyman's investigations upon this animal, in which the whole yolk is shaped into a spiral intestine, there is no longer any reason to resist the conclusion, that this portion of the living mass is as fully subject to that plastic power which