

INDEX

- Adhesive glands, 62, 165.
 Afferent branchial vessels, 153-155.
 Amphioxus, isolation of blastomere,
 127, 131.
 isolation of one-fourth and one-
 eighth blastomeres, 133.
 Anus, 60, 62.
 beginning of, 136-139.
 of Urodela, 139, 140.
 Aorta, early stage, 153.
 Aortic bulb, 153.
 Archenteron, 66-68, 70.
 of spina bifida, 77.
 of hemiembryo, 108, 109.
 posterior pocket of, 136-140.
 enlargement of, 140-143.
 Ascidians, half-development, 127.
 isolation of blastomere, 131.
 Assheton, formation of archenteron,
 70.
 ciliation of embryo, 165.
 Auditory nerve, 164.
 Auricle of heart, 153.
 Axis, primary, 81.
 secondary, 82.
 tertiary, 82.
- von Baer, account of cleavage, 48.
 Barock segmentation, 29.
 Bellonci, direct division of germ-cells,
 12.
 Bergmann, account of cleavage, 49.
 Bernard and Bratuschek, 20.
 Blastomeres, injury to, 106-122.
 Blastopore, 50-57.
 overgrowth of, 50-57, 68.
 injury to, 79.
 position of dorsal lip, 88.
 in compressed egg, 98-101.
 closure of, 137-140.
 of Urodela, 139, 140.
 Blastula, double, 118.
- Blood-corpuscles, 155.
 Body-cavity, 148.
 Bombinator, pronephros of, 158.
 Born, cross-fertilization, 26-28.
 sperm-fluid, 29.
 experiments, 90-92.
 compression of egg, 95-99.
 conclusions from compressed egg,
 102.
 cleavage-plane and embryo-axis,
 108.
 Boveri, second maturation-division, 8,
 9.
 egg-fragments, 30, 31.
 Brain-vesicles, 62.
 Branchial arches, 145.
 Branchial vessel, 153, 154.
 development of, 155.
 Brauer, second maturation-division, 8,
 9.
 Bufo, fertilization of egg, 22.
 vulgaris, cross-fertilization, 26-28.
 communis, cross-fertilization, 28.
- Cardinal veins, 153, 157.
 Cellulation of yolk, hemiembryo, 110.
 Centrifugal force, effect of, 92-94.
 Centrifugal machine, 92-94.
 Cerebellum, 160.
 Cerebral hemispheres, 160.
 Chabry, 127.
 Chun, 127.
 Cilia, on surface, 165.
 Cleavage, 32-41.
 of compressed egg, 96-101.
 of egg in centrifugal machine, 92-94.
 Cleavage-plane, relation to egg-axis,
 82, 85-87.
 Cloaca, opening of segmental duct into,
 156.
 Cœlom, 148, 150.
 relation to pronephros, 156.

- Hertwig, O., second maturation-division, 8, 9.
 rotation of egg, 20.
 cross-fertilization of sea-urchin, 28.
 polyspermy, 30.
 origin of mesoderm, 70.
 formation of spina bifida, 77.
 effect of gravity, 90.
 compression of egg, 95, 99, 100.
 egg in tube, 101.
 law of cleavage, 102, 103.
 injury to blastomere, 112-115.
 methods of injury, 112.
 hemiblastomere lateralis, 113.
 asymmetry of embryo, 113, 114.
 criticism of Roux, 114, 115.
 revivification of injured blastomere, 114, 115.
 criticism of, 121.
 quantitative division, 127.
 interaction of blastomeres, 134.
 effect of temperature, 168, 169.
- Heterotypic division, 5, 6.
- Hind-brain, 160.
- His, elastic plates, 63, 64.
 germinal localization, 125, 126.
- Hoffmann, pronephros, 158.
- Homœotypic division, 6, 7.
- Hydromedusæ, isolation of blastomere, 131.
- Hyla, spermatozoön of, 11.
- Hyoid arch, 145.
 vessel, 153.
- Hyomandibular-cleft, 145.
- Idioplasm, 128.
- Infundibulum, 160, 161.
- Interaction of parts, 124, 125.
- Invagination of archenteron, 70.
- Isotropy, 87.
- Jordan, E. O., entrance of spermatozoön, 35, 36.
 fertilization, 24.
 median plane of embryo, 42.
 overgrowth of blastopore, 68.
- Kölliker, account of cleavage, 49.
- Kupffer, fertilization, 22.
- Lataste, cross-fertilization, 26.
- Lateral line, 164.
- Lens, 162.
- Liver, origin of, 141.
 relation of, to heart, 151.
- Lungs, 145.
- Mandibular vessels, 153, 154.
- Marshall, origin of gill-slits, 144, 145.
 account of lungs and thyroid body, 145.
 origin of optic nerve, 161.
 cranial nerves, 164.
- Marshall and Bles, pronephros, 158.
- Maturation-divisions, of *Grylloblatta*, 2-4.
 of Salamandra, 7, 9.
 of frog, 10.
- Maxillary process, inferior, 61.
 superior, 61.
- Medulla oblongata, 160.
- Medullary folds, inner, 57-59.
 outer, 57-59.
- Medullary plate, 73, 158.
 formation of, 80.
 half, 108.
 length of, 80.
- Mesenchyme, 148, 149.
- Mesoderm, 69, 71-74.
 early condition of, 146.
 extension of, ventrally, 146.
 around blastopore, 147.
 in region of pharynx, 147.
- Mesodermic somites, 148.
- Methods of preservation, Appendix.
- Meves, spermatogenesis of Salamandra, 5, 9.
 direct division of germ-cells, 12.
- Mid-brain, 160.
- Mole-cricket, 2.
- Morgan, T. H., formation of spina bifida, 77.
 injury to blastomere, 120, 121.
 isolation of blastomeres by, 133.
- Morula, 107.
- Mouth, 60, 61.
- Müller, origin of pronephros, 158.
- Muscle fibres, origin of, 149.
- Nasal pits, 62.
- Nephrostomes of pronephros, 156-158.
- Nerves, 163, 164.
 dorsal roots, 163.
 ventral roots, 163.
- Nerve-tube, bending of, 160.
 closure of, 160.

- Nervous system, central, 159-161.
 Neural crest, 159, 160.
 Neural ridge or crest, 163, 164.
 Neurenteric canal, 138-140.
 Newport, absorption of water by egg-membranes, 19.
 entrance of egg into oviduct, 16.
 median plane of embryo, 42.
 Newt, fertilization of, 24.
 Notochord, 70, 73, 74.
 of spina bifida, 76-78.
 half, 108.
 origin of, 146.
 Nuclei, distribution in compressed egg, 104, 105.
 Nucleus, control of cell by, 128.
 qualitative division of, 129.
 Nussbaum, entrance of egg into oviduct, 16.
 Oil-drops, 43-47.
 Oögenesis, 12.
 and spermatogenesis, comparison of, 13, 14.
 Optic lobes, 160.
 Optic stalk, 162.
 Optic vesicles, 160, 161.
 Orientation of egg, 81.
 Pelobates, cross-fertilization, 26.
 Pericardium, 151.
 Pflüger, cross-fertilization, 26-28.
 median plane of embryo, 42.
 blastopore, 51-53, 56.
 account of experiments, 81-89.
 methods, 82.
 conclusions from experiments, 87-89.
 compression of egg, 95.
 conclusions from compressed egg, 101, 102.
 cleavage-plane and embryo-axis, 108.
 Pharynx, 62, 145.
 Pigment, distribution of, 15.
 rotation of, 83.
 Pineal body, 160, 161.
 Pituitary body, 161.
 Plane of embryo, median, 42.
 Pneumogastric nerves, 164.
 Polar body, first, extrusion of, 16-18.
 second, 21.
 in inverted egg, 91.
 Polarization of egg, 88.
 Poles of egg, 81.
 Polyspermy, 30.
 Post-anal-gut, 141.
 Postgeneration, 110, 111, 116, 128, 129.
 of archenteron, 111.
 of medullary folds, 111.
 of mesoderm, 111.
 of ectoderm, 111.
 of whole embryo, 122.
 Prévost, account of cleavage, 48.
 Primitive groove, 57, 72.
 Primitive segments, origin of, 147.
 Proctodæum, 141, 158.
 Pronephric capsule, 156.
 Pronephros, 155-158.
 Pro-nucleus, union, 23.
 apposition of, 35.
 Rana arvalis, cross-fertilization, 27, 28.
 Rana esculenta, spermatozoön of, 11.
 cross-fertilization, 26-28.
 effect of light, 170.
 Rana fusca, extrusion of polar body, 21.
 cross-fertilization, 26-28.
 inversion after first cleavage, 116-118.
 effect of temperature, 168, 169.
 Rana temporaria, egg-laying, 17.
 time of egg-laying, 168.
 effect of light, 169, 170.
 vom Rath, spermatogenesis of *Gryllotalpa*, 2-4.
 spermatogenesis of *Salamandra*, 5, 7.
 tetrad formation in *Salamandra*, 8.
 spermatogenesis of frog, 10.
 direct division of germ-cells, 12.
 Rauber, interchange of nuclei, 30.
 segmentation, 39.
 effect of gravity, 90.
 Reichert, account of cleavage, 49.
 Remak, segmentation, 38.
 account of cleavage, 49.
 Reorganization, 109, 110.
 Retina, 161.
 Robinson, formation of archenteron, 70.
 Rotation of egg, 83-85.
 Roux, artificial fertilization, 32.

- Roux (*continued*).
 median plane of embryo, 42.
 experiments with oil-drops, 43-47.
 spina bifida, 75.
 centrifugal machine, 92-94.
 egg in tube, 100, 101.
 methods, 106, 107.
 injury to blastomere, 106-111.
 cleavage-plane and embryo-axis,
 108.
 mosaic theory, 109, 123, 126.
 whole embryos, 121.
 subsidiary hypothesis, 127-129.
 anachronism in cleavage, 129.
 part of egg removed, 130.
 qualitative division of nucleus,
 134.
- Rusconi, cross-fertilization, 24.
 account of cleavage, 48.
- Sachs, law of cleavage, 102.
- Salamandra, isolation of blastomere,
 131.
- Salt-solution, effect of, 77.
- Schleiden, 49.
- Schnetzler, effect of light, 169.
- Schultze, M., segmentation, 39.
 account of cleavage, 49.
- Schultze, O., formation of egg, 12.
 rotation of egg, 20.
 polar bodies, 21.
 origin of mesoderm, 71.
 experiments of, 116-118.
 effect of temperature, 169.
- Schwann, 49.
- Sea-urchin, cross-fertilization, 30.
 isolation of blastomeres, 126.
 half development, 127.
 fragments of egg, 130, 131.
- Segmentation, variations of, 41.
- Segmentation-cavity, 40, 41, 67, 71.
- Self-differentiation, 123, 124, 126.
- Semiblastula verticalis, 107, 108.
- Semigastrula verticalis, 107, 108.
- Semimorula verticalis, 107, 108.
- Sense-plate, 57-60.
- Sex-cells, development of, 1.
- Sinus venosus, 151.
- Size of egg, 95.
- Somatic layer, of mesoderm, 147.
 of heart, 151.
- Somites, mesodermic, 148.
 of head, 148.
- Spallanzani, egg-laying, 17.
 account of cleavage, 47.
- Spermatid, 1.
- Spermatocyte, 1.
- Spermatogenesis, 1, 10.
 salamander 4, 5.
- Spermatogenesis and oögenesis, com-
 parison of, 13, 14.
- Spermatogonia, 1.
- Spermatozoön, of frog, 4, 5, 11.
 inheritance through, 134.
- Spina bifida, 75-80.
- Splanchnic layer of mesoderm, 147.
 of heart, 151.
- Star-fish, cross-fertilization, 30.
- Stomodæum, 60, 159.
- Strasburger, action of nucleus on cell,
 135.
- Suckers, 60, 62, 166.
- Swammerdam, passage of egg from
 ovary to oviduct, 17.
 account of cleavage, 47.
- Sylvian aqueduct, 100.
- Tail, 62.
- Teleostei, isolation of blastomere, 131.
- Temperature, effect of, 167-170.
- Tetrad, 3, 4, 8.
- Thyroid body, 145.
- Toad, European, spermatozoön of,
 11.
- Totipotence, 132, 133.
- Trigeminal nerve, 164.
- Triton alpestris, cross-fertilization, 26,
 28.
 taniatus, cross-fertilization, 26, 28.
- Truncus arteriosus, 153.
- Urodela, anus of, 139, 140.
 closure of blastopore, 139, 140.
- Vagus, near first somite, 148.
- v. la Valette St. George, terminol-
 ogy, 1.
- Ventricle of heart, 153.
- Visceral-arches, 145.
- Visceral-slits, 145.
- Vitelline veins, 151.
- Vitreous body, 162.
- Vogt, segmentation, 38.
- de Vries, action of nucleus on cell,
 135.

- Weismann, theory of heredity, 14.
 qualitative nuclear division, 129.
 qualitative division of nucleus,
 134.
- Wetzel, double embryos, 118, 119.
- Whitman, theory of embryo, 136.
- Wichmann, pronephros, 158.
- Wilson, E. B., amphioxus, 127.
- Wrinkles of egg, 33.
- Yolk-granules, absorption of, 141.
- Yolk-plug, withdrawal of, 140.
- Yung, effect of light, 169, 170.
- Ziegler, embryos, 61.
- Zoja, isolation of blastomeres by, 132.