reality. *See* ethnomethodology; metaphysics; philosophy; realism; relativism; truth as coherence; truth as correspondence.

reason. *See* Kant's theory of knowledge; mind–body relation; modern logic; perfectibility of Man; rationalism; rational soul.

reason in animals. *See* instinct.

recapitulation. The doctrine in biology that individual embryological *development [*ontogeny] follows the same pattern as the development of the relevant animal series [*phylogeny]. Leading recapitulationists among **Naturphilosophen* were L. Oken (1779–1851) and J. F. Meckel (1781–1833), whose views were taken up by French transcendentalists such as Etienne Geoffroy St Hilaire (1772–1844), leading to the theory of *species formation by developmental arrests [*monsters]. Although prestigious, the concept of recapitulation was criticized by K. E. von Baer (1792–1876): he denied the embryo ran through the adult forms of lower animals, particularly because many features of the adult are not present in embryonic animals and vice versa. Nevertheless, recapitulation seemed to unify *Nature. Charles Darwin (1809–82) followed other systematists in assigning value to embryology for understanding *classificatory relations, his *evolutionary theory providing a source for the most famous protagonist of recapitulation, Ernst Haeckel (1834–1919). Haeckel proposed a 'biogenetic law' (individual development recapitulates the evolutionary history of that particular species), believing the two were causally linked and abolishing *idealist connotations. The idea of a biogenetic law declined with the rise of late-19th-century experimental biology: embryological stages were seen to be *adapted to their immediate circumstances, rather than as signs of ancestry; physiological and *cell lineage studies, and the *gastraea theory, showed only the broadest of correspondences between embryo and ancestor. Biologists, however, still discuss recapitulation in a loose sense.

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EJB

reckoning. *See* numbers.

recombination. The chromosome theory (that the material of inheritance resides in the *chromosomes) received wide support after the rediscovery of *Mendelism in 1900. Understanding of *mitosis and *meiosis after 1905 made more desirable the correlation of physical characteristics with the chromosomes and more specifically 'factors' on the chromosomes.

Studies of *Drosophila* flies *c*1910 by Thomas Hunt Morgan (1866–1945) showed traits such as wing size or body colour were correlated with particular chromosome configurations, especially with the specialized x-chromosomes and thus sex-linked. Most sex-linked factors occurred together, suggesting they were linked along the same chromosome. Exceptions to this general rule meant that some factors were recombined. Morgan proposed chromosomes lying side by side would cross over and undergo recombination of factors before separation during cell division. Recombination could also happen during meiosis, thereby providing a source of variation [*heredity and variation] for *evolution. The phenomenon was much used for mapping chromosomes, and for understanding *genes.

JM

recon. *See* gene.

rectilinear coordinate system. *See* function.

red blood cells. *See* animal heat; blood; blood cells; chlorosis; respiration.

redshifts. *See* expanding Universe; relativity; theory-laden terms.

reduction. In the philosophy of science reduction refers to either the definition of non-observable (e.g. dispositional or theoretical) properties or entities in terms of observable ones; or to the explanation of a theory, or groups of *laws, in terms of more basic, fundamental or general ones. 'Reduction' in the first sense is sometimes associated with R. Carnap's (1891–1970) theory of *reduction sentences, which is subject to many of the objections brought by philosophers against purely *ostensive definition. The second was introducted by E. Nagel (*b* 1901). In this sense, 'reduction' is a species of *explanation. It may be exemplified by the unification and increased coherence made possible by the *kinetic theory of gases. Not only did it succeed in explaining a vast array of hitherto mysterious