CAMBRIDGE

Cambridge University Press
978-1-108-06666-2 - History and Root of the Principle of the Conservation of Energy
Ernst Mach Translated by Philip E. B. Jourdain
Index
More information

INDEX

Absorption and emission, Kirchhoff on, 81.
Action at a distance, 56.
Adler, Friedrich Wolfgang, 94.
Alchemy and science, 64.
Alembert, d', 22, 30, 96.
Analogy between heat and work, 107.
Analysis of the Sensations, 9n., 12n., 95, 96, 102.
Angle of rotation, 60.
A priori considerations, 23.
Arbeit, The term, 5n., 93.
Archimedes, 65, 66, 105.
Arréat, Lucien, 6.
Atomic theory, Insufficiency of, 86.
Atoms not to be thought spatially, 87.
Avenarius, 6n., 7n., 104.

Baumann, J., 7n.
Bendixen, F., 6n.
Bernoulli, Daniel, 30.
Bernoulli, James, 30.
Bernoulli, John, 30, 31.
Bewegungsempfindungen, 95.
Black, 47.
Boltzmann, Ludwig, 6n., 102, 109; Mach's definition of mass accepted by, 107.

Cantor, Moritz, 21n.
Carl's *Repertorium,* 80.
Carnot, S., 35 f., 38n., 39, 42, 43, 94, 97.
Case, T., 6.
Causality, Fechner's law of, 60, 98; Last form of the law of, 64; Law of, 59ff., 69, 81; Law of, and freedom of will, 90; Law of, defined, 61; Law of, empty and barren without positive experience, 65; Various forms of the law of, 99; Youthful conception of, 64.
Causation, Concept of function substituted for, 101.
Choice of facts, 57.
Classical education, 17.
Clausius, 36, 38n., 43, 62, 97; on thermodynamics, 81.
Clifford, W. K., 11, 108.
Conformity of nature to reason, Science implies, 100.
Conservation of energy, Poincaré on the, 102; of energy, Stallo on evolution of the, 101; of matter, 48; of weight, 48; of work an instrument of research, 40; of work, Law of the, 73; of work, Theorem of the, 19.
Contact action, 56.
Co-ordinates, System of, 77.

© in this web service Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-1-108-06666-2 - History and Root of the Principle of the Conservation of Energy
Ernst Mach Translated by Philip E. B. Jourdain
Index
More information

Coulomb, 38n., 44, 46.
Crelle, 34.

Dampness can perform work, 43.
Dependence of phenomena, 63.
Determination, Means of, 105.
Dimensions, Spaces of many, 94.
Distance, Forces functions of, 89, 90.
Duhem, P., 11.

Ear, Time-sense of the, 90.
Earthquake, Law of inertia in an, 78.
Economical value of laws and explanations, 55.
Economy of thought, 9, 88, 94, 109; Principle of, 103.
Eleatics, 49f.
Electrical energy, Mechanical equivalent of, 44.
Electricity, No satisfactory theory of, 54.
Elsas, 6.
Energy, Equivalent of, 44; Localization of, 109; of heat, 47; The term, 5n., 93.
Epistemological standpoint, Exposition of, 9.
Equilibrium, Determination of, 105.
Equivalent of energy, 44.
Erkenntnis und Irrtum, 7n., 10, 95.
Euler, 19, 30, 103.
Experience, Theorems of, 84.
Explanations, Economical value of, 55.

Facts, Choice of, 57.
Faraday, 19, 93, 108.
Favre, 37.
Fechner, 90f.; his formulation of the law of causality, 60, 98.
Fichte's *Zeitschrift für Philosophie,* 87, 88.
Force, as pressure, 82; Definition of, 84; The term, 93.
Forces, functions of distance, 89, 90; Mutual independence of, 83; Spatial relations recognized by, 89.
Formula, Economical value of a, 55.
Foucault's experiment, 77.
Freedom of will, Law of causality and, 90.
Function, Concept of, substituted for causation, 101.
Fundamental facts, Choice of, 57; dependent on custom and history, 56.

Galileo, 20, 23, 29, 31, 38n., 75, 96, 105; his demonstration of the law of the lever, 66; quoted, 24-28.
Gauss, 34f., 97, 103.
Geschichte und Kritik des Carnot'schen Wärmegesetzes, 94.
Gibson, W. R. Boyce, 6, 103n.
Grassmann, Hermann, 106, 108.
Gravitation, Newton's theory of, 56.
Gray, George J., 75.

© in this web service Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-1-108-06666-2 - History and Root of the Principle of the Conservation of Energy
Ernst Mach Translated by Philip E. B. Jourdain
Index
More information

Hamilton, 103, 106.
Hankel, Hermann, 106n., 108.
Hauptfragen der Physik, 76.
Heat, and work, Analogy between, 107; as motion and substance, 47 f.; Energy of, 47; Theory of, 42.
Helm, 94, 107, 108.
Helmholtz, 36, 38, 39, 96.
Heraclitus, 17.
Herbart, 16, 49, 87.
Herrmann, E., the political economist, 30, 88.
Hertz, 6n., 11, 97.
Historical studies, 16, 18.
Höffding, Harald, 6.
Hönigswald, 7n.
Humidity, 43.
Huygens, 28, 32, 38n., 96, 105.
Hypotheses a work of supererogation, Unverifiable, 57.

Indefiniteness in nature, 62.
Independence of forces, Mutual, 83.
Inertia, Law of, 24, 72, 93; Law of, in an earthquake, 78; Indefiniteness of law of, 75ff.
Intelligibility of nature, 99.
Intelligible space, 87.

Jahrbuch über die Fortschritte der Mathematik, 7n.
Joule, 37, 43, 97.
Jourdain, Philip E. B., 99ff, 109.
Journal für reine und angewandte Mathematik, 34.

Kant, 11, 16; *Prolegomena* of, 96.
Kirchhoff, 10; 38n., 96; on absorption and emission, 81.
Kleinpeter, Hans, 6n., 98, 102.

Lagrange, 20, 30-32, 35, 39, 105, 108.
Lampe, E., 97n.
Law, Economical value of a, 55.
Lessing, 15.
Lever, Law of the, 105; Law of the, demonstrated by Galileo, 66.
Levi, Adolfo, 7n.
Lindt, R., 96
Logic, Mimicry by, 100; of natural science, 59.
Lotos, 85.
Love, A. E. H., Mach's definition of mass accepted by, 107.

Mach, 6n.; Generosity of, 7.
Maggi, Gian Antonio, Mach's definition of mass accepted by, 107.
Malus, 69.
Mariotte's law, 73.
Mars, Physics of, 95.
Mass, Definition of, 5, 10, 80, 84; Mach's definition of, 107; Mach's views on, 101.
Masses, Motion of, 82.
Matter, Conservation of, 48.
Maxwell, 6n., 98, 108, 109.
Mayer, J. R., 19, 36, 37, 39, 43, 58, 97.
Mechanical equivalent of electrical energy, 44; facts not more intelligible than others, 56.

© in this web service Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-1-108-06666-2 - History and Root of the Principle of the Conservation of Energy
Ernst Mach Translated by Philip E. B. Jourdain
Index
More information

Mechanics, 109; Basis of, 32; Principle of excluded perpetual motion not founded on, 41.
Mechanics, The Science of, 9n., 11n., 93, 95, 96, 97, 101, 103, 105, 107.
Mill, J. S., 7n.
Mimicry by logic, 100.
Minkowski, H., 95.
Molecular processes need not be represented spatially. 86.
Monist, 99, 101, 106.
Motion, absolute, 77; Heat as, 47; Newton's laws of, 98n.; of masses, 82.
Motions, Physical events reduced to spacial, 50.
Mysticism, 73.

Nature, Indefiniteness in, 62; Intelligibility of, 99; to reason, Science implies conformity of, 100.
Neumann, 37, 38n., 39, 76, 90, 105.
Newton, 75, 82; Laws of motion of, 98n.; Rotating bucket of, 101; Theory of gravitation of, 56.

O'Brien, M., 108.
Ostwald, 6n., 7n., 11, 38n., 94, 96.

Padé, H., 106.
Pearson, K., 11.
Perpetual motion, 19, 21; Examples of theorem of, 71; not founded on mechanics, Principle of, 41; Principle of excluded, 28, 30, 42, 59ff., 69, 72, 73, 80; Second theorem of excluded, 40.
Pétrovitch, M., 108.
Petzoldt, 6n., 93, 102.
Physics, 91; Foundation of, thermal or electric, 94; Object of, 89; of Mars, 95.
Place, Change of, 49.
Planck, Max, 10, 11, 38n., 106, 109.
Poggendorff, 10, 80.
Poincaré, Mach's definition of mass accepted by, 107; on the conservation of energy, 102.
Poinsot, 33f., 71; Couple of, 68.
Points of reference, 78.
Poncelet, 19.
Popper, J., 11, 16n., 93, 94.
Popular Scientific Lectures, 6n., 38n., 91, 96, 97, 107, 109.
Position of a system, 97.
Potential-lever a scalar, and not a vector, 94.
Presentations distinguished from our sensations, 91.
Pressure, Force as, 82.
Psychology, 91.

Reason, Science implies conformity of nature to, 100.
Reference, Points of, 78.
Relativity, Principle of, 95.
Riemann, 88, 97.
Riess, 45f.
Ring, Three bodies on a, 83.
Rotating bucket, Newton's, 101.

© in this web service Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-1-108-06666-2 - History and Root of the Principle of the Conservation of Energy
Ernst Mach Translated by Philip E. B. Jourdain
Index
More information

Rotation, Angle of, 60.
Rumford, 37.
Russell, Bertrand, 98, 101, 105, 106.

Saint-Venant, Barré de, 106, 108.
Scalar, Potential level a, 94.
Schlömilch's *Zeitschrift*, 87.
Science, Alchemy and, 64; implies conformity of nature to reason, 100; impossible if all facts were directly accessible, 54; Logic of natural, 59; Problem of, 91.
Scientific theories in general, An observation on, 54.
Silbermann, 37.
Soul, 48.
Space and time not independent entities, 95; dimensions, Thinkable possibilities in, 53; Intelligible, 87; Intuition of, bound up with the organization of the senses, 86; of one dimension, Tones analogous to, 87; of three dimensions, Chemical elements not represented in, 87; Physical, interdependence of phenomena, 89; Presentations of, 88; Table showing limitations of thought analogous to, 51.
Spaces of many dimensions, 94.
Spatial determinations, 61; motions, Physical events reduced to, 50; relations recognized by forces, 89.
Stallo, 11, 98, 101, 105.
Stevinus, Simon, 20-23, 31, 66, 96.
Stumpf, C., 6.
Substance, Heat as, 47 f.
Sufficient reason, Law of, 66, 69, 81, 82, 97, 102.
Symbolical physicists, 102.
System, Position of a, 97.

Table showing limitations of thought analogous to space only, 51.
Taylor's theorem, 100.
Temperature, Differences of, 82.
Theories like dry leaves, 74.
Thermodynamics, Second law of, 85, 109.
Thermoelectrometer, 45.
Thomson, W., 36, 62, 97.
Thought analogous to space only, Table showing limitations of, 51.
Time and space not independent entities, 95; is money, 60;—sense of the ear, 90.
Tones analogous to space of one dimension, 87.
Top can perform work, A, 71.
Torricelli, 30-32, 80, 96.
Tuning-fork a source of work, 71.
Typonoetic theory, 102n.

Unideterminateness of things, 105.
Uniformity of nature, 100.
Uniqueness, Principle of, 103.
Universe like a machine, 62.
Unverifiable hypotheses a work of supererogation, 57.

© in this web service Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-1-108-06666-2 - History and Root of the Principle of the Conservation of Energy
Ernst Mach Translated by Philip E. B. Jourdain
Index
More information

Varignon, 30.
Vector, Potential level not a, 94.
Velocities, Equalizing, 82.
Virial, 109.
Vis viva, 43, 72; Principle of, 96.
Voss, A., 96, 108, 109.

Wald, F., 11.
Ward, James, 101, 106.
Wärmelehre, 10, 93, 94, 95, 97, 103, 107, 109.
Weight, Conservation of, 48.
Whitehead, A. N., 109.
Wiktorov, D., 7n.
Work, A top can perform, 71; Analogy between heat and, 107; Source of, 69ff; The term, 5n., 93.
Wronsky, 94.
Wundt, 49; Axioms of, 39f.

Zeuner, 94; Analogy of, 107.

© in this web service Cambridge University Press www.cambridge.org