

for the first time connected into a great organisation by the French Academy of Sciences.

The opposition in which the new school of exact and detailed research stood to the representatives of the broad philosophical view gave rise to a great many currents of thought; for neither the former nor the latter presented a united front. Among those who advocated the exact methods of research there was a section which clung more exclusively to the empirical side, and cultivated the descriptive and experimental sciences; whereas others, whom we may call the French school of science, developed the mathematical methods, not without a certain ill-disguised contempt for pure empiricism.¹ On the side of classical and philosophical studies there was a section which cultivated the historical² in contradis-

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Conflict between the scientific and the philosophical views.

¹ On the relations of mathematical and experimental physics, and the different opinions which existed during the first half of the century, see Helmholtz's popular addresses in many places, but especially the discourse on Gustav Magnus (1802-70), who may be regarded as a representative of the experimental school in Germany. In the opinion of this school, which cultivated the borderland of physics and chemistry, of organic and inorganic phenomena, or investigated the less known phenomena of frictional electricity (Riess) or the complicated phenomena of meteorology (Dove), a danger existed that mathematical theories and elaborate calculations might lead to an estrangement from nature and observation, similar to that which speculative philosophy had created before. Helmholtz himself was met by this sentiment when he published his great memoir,

'Ueber die Erhaltung der Kraft,' in 1847; Poggendorf's physical periodical would not receive it, and Jacobi, the mathematician, was the only one who showed any interest in it. See Helmholtz, 'Wissenschaftliche Abhandlungen,' vol. i. p. 73; 'Reden,' vol. ii. p. 46.

² As the philosophy of Schelling promoted a study of nature, and in doing so prepared its own downfall, so the philosophy of Hegel led to a study of history, and thus to the proof of the insufficiency of its own generalisations. Many valuable beginnings of historical research emanated also from the Romantic school of literature. In all these instances philosophical interests led beyond the abstract logical and metaphysical treatment into the broad and fertile plains of actual life, be it that of nature or of art or of history. But the true methods of research in