has long been somewhat clouded by the celebrated controversy over the relative merits of his contribution and that of the French savant, Champollion. The whole problem is examined once again in dispassionate fashion by Wood, and Young emerges with his stature in this field rather heightened by the evidence presented. Actually it appears that there was ample credit to go around!

It is not generally recognized that Young contributed notably to the success of the early editions of the *Encyclopedia Britannica* by his authoritative articles on such varied subjects as "Cohesion," "Egypt," "Bridge," "Chromatics," "Weights and measures," "Tides," "Lagrange," and "Road making." By a singular irony, the biography of Young himself that appeared in the 11th edition of the *Britannica* (1911) was omitted in the 14th edition (1929). Fortunately it has been restored in the latest reprinting.

Unfortunately Alexander Wood did not live to complete his writing of Young's biography. Frank Oldham, whose interest in Young is attested by his own brief life of the natural philosopher (1933), has done a commendable job of finishing the work. A brief memoir on Wood, whose books on sound are recognized as of great value by all acousticians, prefaces the volume, which will undoubtedly be greatly cherished by all who are interested in the history of physics.

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Energy Transfer in Hot Gases. Proceedings of NBS Symposium held 17–18 Sept., 1951 National Bureau of Standards, (Supt. of Documents), Washington, D. C., 1954. iv + 126 pp. Illus. $1.50.

This book contains 10 papers of a spectroscopic nature, two on reaction mechanisms, two on the flame mechanics, and two on flame temperatures.

Only a few interesting details, taken at random from these reports, can be mentioned here to give an idea of the scope of the symposium. One such detail, reported by Benedict and Plyler, is the discrepancy between temperatures measured in hydrocarbon flames, that is, 2400° to 2800°K obtained from resolved infrared spectra, and values of more than 3000°K obtained from the visible and ultraviolet spectra for the same flame regions. It is attributed to the difference in lifetime in transitions (10^{-3} to 10^{-1} sec and 10^{-8} to 10^{-6} sec, respectively). This means that molecules that radiate vibration-rotation energy will have survived many collisions and, hence, will have a much greater chance of being near to thermodynamic equilibrium than molecules that emit electronic energy.

According to Sen's article on "Astrophysicist's concept of temperature," deviations from thermodynamic equilibrium also play a decisive role in solar and stellar thermometry and have led to the use of "operational concepts of temperature," such as "effective temperature," "color temperature," "excitation temperature," and "ionization temperature." Only in the relatively seldom occurring case of complete equilibrium are all these temperatures *one and the same,* and one can speak of *the* temperature of the stellar atmosphere. The author mentions that this is not a purely academic question:

> The solar chromosphere and corona, and the highly turbulent atmospheres of giant stars are Nature's gigantic laboratories for the testing of new physical theories of turbulence, shock waves, and departures from thermadynamic equilibrium.

For the time being, Penner, in his study on infrared emissivity of diatomic gases, has developed an equation which he claims is the only available relationship for estimating the equilibrium emissivities of diatomic gases under the conditions existing in rocket combustion chambers, our low-scale imitations of stellar fast-moving furnaces.

Persons not too familiar with the details of spectroscopy will find particular interest in Bernard Lewis' comprehensive paper on the theory of combustion waves in which suitably simplified models of the combustion wave are envisaged and explained, some considering only diffusion, others only the flow of heat, and so forth. Another paper, contributed by Karlovitz, describes in some detail how turbulent flames can generate additional turbulence.

Finally, it may be mentioned that a "Combustion colloquium" was held at Cambridge University, England, 2 years after the National Bureau of Standard's symposium. It comprised 18 contributions, mostly on flame propagation, only two on spectroscopy, which have been edited by W. R. Hawthorne and J. Fabri under the title *Selected Combustion Problems: Fundamental and Aeronautical Applications* (Cambridge Univ. Press, 1953, viii + 534 pp.).

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Essays on the Social History of Science. S. Lilley, Ed. Munksgaard, Copenhagen, 1953. 182 pp. Paper, Kr. 30.

This book has been produced under the auspices of the Commission for the History of the Social Relations of Science, a group that was appointed by the International Union for the History of Science, which is the administrative organ of the International Academy for the History of Science. Financial assistance was provided by UNESCO, and this organization suggested the original idea for the preparation of this book.

We must be grateful to UNESCO, as well as to the editor and the authors, for producing a work of significance for all who are concerned with the social relationships of science, and this means almost everyone—scientist and nonscientist alike.

The essays cover a wide range in time and in subject matter. Several of the titles will indicate the rich content of this thought-provoking volume: "The rise of abstract science among the Greeks" by B. Farring-