will doubtless stimulate renewed investigation of them. The book reveals very fully the fundamental significance of inflammation in relation to infection and immunity.

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PHOTOELASTICITY

Elasticité et Photoélasticimétrie. By H. LE BOITEUX and R. BOUSSARD. 361 pp. Paris: Hermann and Cie, 1940. 180 francs.

ALTHOUGH the technique of photoelasticity, a practical method to determine complicated two-dimensional stress distributions experimentally, was originated in France by Mesnager in 1901, this is the first French book giving a comprehensive account of the theoretical and practical aspects of the method. It is divided into four sections, of which the first is an exposition of the theory of elasticity in the classical manner. The second section does the same for optics, first of isotropic and later of anisotropic mediums. These two sections comprise half the book and do not as yet mention photoelasticity. In the third section the two theories are combined and a discussion is given of apparatus, experimental techniques and properties of the materials used. The last quarter of the book is devoted to methods of numerical integration for finding the principal stresses individually, which is necessary since the photoelastic pictures only determine the difference between these stresses at each point. It is noted that the authors show a number of colored pictures of stress distributions, which represented good practice a decade ago. Although the superiority of monochromatic light and black-and-white pictures over colored pictures is casually mentioned in the text, the authors evidently do not use the improvement in their own laboratory.

A very complete and encyclopedic book, entitled "A Treatise on Photoelasticity," on the subject was published in 1931 by Coker and Filon (Cambridge University Press) which from a technical standpoint is now somewhat out of date. The present French volume is more clearly written; it is easily readable and presents the theory quite adequately; but, although appearing nine years later, it is no better than Coker-Filon in the technical parts of the subject. And it is just in the technical direction that great advances have been made lately, making the now obtainable accuracy in reading stresses about ten times better than that shown in the book.

Another recent volume on the subject written by Mesmer is entitled "Spannungsoptik."[1] The first half of its total of 220 pages follows the French book in its general structure, while the last half discusses experimental techniques and the more modern applications. The bibliography appended refers principally to the last decade, listing 240 papers published since 1930, whereas the French bibliography practically stops with the year 1931.

The most interesting recent development of photoelastic technique is its extension to three-dimensional stress distributions. This is done by exposing the bakelite model to a load at a fairly high temperature and then cooling it under load. A subsequent removal of the load leaves the model without stress but with optical properties that can be correlated to the stress that existed in it before the load removal. Although not yet developed to the point of being a practical engineering tool, this method shows great promise of becoming such a tool in the near future. It is discussed briefly by Boiteux-Boussard as well as by Mesmer.

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SPECIAL ARTICLES

ON THE INTERDEPENDENCE OF RESPIRATION AND GLYCOLYSIS[1]

THE following definition of the Pasteur effect has recently been suggested by Burk:[2] (a) O_2 inhibition of fermentative processes, and at times also (b) O_2 stimulation of anabolic syntheses, the latter effect not being invariably concomitant with the former. Crabtree[3] in 1929 found that the respiration of transplantable tumors was about 12 per cent. lower in the presence of glucose than in its absence and suggested that glucolytic activity exerts a checking effect on the capacity for respiration of tumors. This phenomenon has been called a reversed Pasteur effect (or the Crabtree effect). The occurrence of the Crabtree effect in transplantable tumors has been confirmed.[4,5] Likewise, the effect was observed in lymph nodes of leukemic mice.[6]

We have noticed that the inhibition of respiration by the addition of glucose occurs also in normal tissues with an aerobic glucolysis. In the renal papilla of the rat, which is known to have a metabolism similar to tumors,[7] the inhibition amounted to 20 per cent.

[1] From the Laboratory of Orthopaedic Research of the Harrison Department of Surgical Research, Schools of Medicine, University of Pennsylvania, Philadelphia, Pa.

[2] D. Burk, Cold Spring Harbor Symposia on Quantitative Biology, 7: 420, 1940.

[3] H. G. Crabtree, *Biochem. Jour.*, 23: 536, 1929.

[1] Berlin: Julius Springer, August, 1939.

[4] E. Krah, *Biochem. Zeit.*, 219: 432, 1930.

[5] K. A. C. Elliott and Z. Baker, *Biochem. Jour.*, 29: 2433, 1935.

[6] J. Victor and J. S. Potter, *Brit. Jour. Exp. Path.*, 16: 253, 1935.

[7] P. György, W. Keller and Th. Brehme, *Biochem. Zeit.*, 200: 356, 1928.