

Plasma Arc Heating for Hypersonic Wind-Tunnels

E. A. Bunt and H. L. Olsen, of the Applied Physics Laboratory, Johns Hopkins University, have examined the special requirements imposed on the operation of hypersonic wind-tunnels when the test models are air-breathing engines equipped with facilities for fuel injection and actual combustion. Because of the difficulties involved in scaling the results of combustion processes, the flow in the working section has to be simulated correctly for a period of the order of minutes in respect of both static temperature and pressure at a given altitude. This in turn requires that the stagnation temperature and pressure are high. The investigators have shown that at present only the plasma arc possesses the practical capability of heating the gas under such extreme conditions (for example, 2,900° K. and 1,000 lb./in.² for a Mach number of 8 at 120,000 ft.). Design configurations and operating characteristics of arcs suitable for powering hypersonic wind-tunnels are discussed by Bunt and Olsen in the September issue of *Research Applied in Industry* (14, No. 9; September 1961). Developments undertaken at the Applied Physics Laboratory to construct an arc unit operating at 1,000 lb./in.² and 2,500 B.T.U./lb. for the purpose of driving a hypersonic propulsion tunnel are cited as examples for this application.

Automobile Technical Congress

THE ninth international Automobile Technical Congress of the Federation Internationale des Sociétés d'Ingenieurs des Techniques de l'Automobile, organized by the Automobile Division of the Institution of Mechanical Engineers, is to be held in London and the Midlands during April 30–May 5. The subjects under discussion will include: development work on a combustion system for vehicle Diesel engines (Dr. F. Pischinger); the measurement of exhaust gases from Diesel automobile engines (F. P. Malschaert); contributions to the study of the dynamics of automobile under braking conditions (M. J. Odier); the disk brake (Dr. R. C. Parker); vehicle vibrations during braking (Dr. Giacosa and E. Cordiano); future developments in achieving maximum safety in motor vehicles (Prof. W. Kamm); universal tyre test machine (V. E. Gough and S. J. Whitehall); a study of dynamic steering properties of pneumatic tyres (Y. Saito); vertical oscillations in different types of automobile (A. Chiesa and L. Oberto); the slipper type pump for automobile hydraulics (H. M. Clark); evaluation of vitally important vehicle components by programme testing (E. Cassner and W. Schutz). Further information can be obtained from the Automobile Division of the Institution of Mechanical Engineers, 1 Birdcage Walk, London, S.W.1.

Announcements

AN international symposium on "Permeability" is to be held in Wageningen during May 1–4. Further information can be obtained from Dr. J. van Die, Plant Physiological Research Centre, Wageningen.

A MEETING of the European Biological Research Section of the International Gerontological Society is to be held in Paris during April 2–4. Further information can be obtained from Prof. F. Bourlière, Faculté de Médecine de Paris, 45 rue des Saints-Pères, Paris 6.

THE second international conference on "Stress Analysis", arranged by the Groupement pour l'avancement des Méthodes d'Analyse des Contraintes, is to be

held in Paris during April 10–14. Further information can be obtained from the Secretary, Joint British Committee for Stress Analysis, 1 Birdcage Walk, London, S.W.1.

THE fourteenth international symposium on "Crop Protection", organized by the State Agricultural College, Ghent, is to be held on May 8. Further information can be obtained from Prof. J. van den Brande, International Symposium on Crop Protection, State Agricultural College, Coupure Links 233, Ghent, Belgium.

A SYMPOSIUM on "The Physics of Graphite-Moderated Reactors", sponsored by the Institute of Physics and the Physical Society, together with the British Nuclear Energy Conference, is to be held in Bournemouth during April 4–6. Further information can be obtained from the Secretary, Institute of Physics and the Physical Society, 47 Belgrave Square, London, S.W.1.

AN international symposium on "Analytical Chemistry", arranged by the Society for Analytical Chemistry to commemorate the seventieth birthday of Prof. F. Feigl, is to be held in Birmingham during April 9–13. Further information can be obtained from Mr. M. L. Richardson, John and E. Sturge, Ltd., Lifford Chemical Works, Lifford Lane, Kings Norton, Birmingham 30.

THREE symposia entitled "Some Aspects of the Chemistry of Natural Phenols", "Reactivity and Structure in Inorganic Chemistry" and "The Transition State" are to be held in Sheffield during April 3–5, in conjunction with the anniversary meetings of the Chemical Society. Further information can be obtained from the General Secretary, the Chemical Society, Burlington House, London W.1.

AN international congress on "Hormonal Steroids" is to be held in Milan during May. The programme will include symposia on: new steroids with hormonal-like activities; pathways of synthesis and metabolism of hormonal steroids; control of synthesis and release of steroid hormones; mechanism of steroid action: substances which affect the synthesis and action of steroid hormones; non-hormonal activities of steroids. Further information can be obtained from Prof. L. Martini, Istituto di Farmacologia e Terapia, 21 via A. del Sarto, Milan.

A SYMPOSIUM on "Oxidation and Reactivity of Graphite", arranged by the Department of Chemical Engineering, Imperial College of Science and Technology, London, under the auspices of the Faraday Society, is to be held on March 29. The chairman will be Prof. A. R. Ubbelohde, and the speakers will include Dr. R. L. Bond, Dr. J. B. Lewis, Mr. W. H. Davidson, Dr. R. F. Strickland-Constable and Dr. F. M. Lang. Further information can be obtained from Dr. G. S. Parry, Department of Chemical Engineering and Chemical Technology, Imperial College of Science and Technology, London, S.W.7.

ERRATA. The presentation by Mr. J. R. Hugh Sumner of £50,000 was to the University of Birmingham and not, as published on p. 123 of *Nature*, January 13, 1962, to the University of Bristol.

In the heading to Table 1 of the communication entitled "Release of Noradrenaline from the Spleen of the Cat by Acetylcholine" (*Nature*, 192, 880; 1961) the units for the noradrenaline content should be NGM./ML. and not MGM./ML. as printed.