

tative assessment of electrode activity due to surface films was described by E. B. Pattinson (Department of Physics, University College of Swansea) and the influence of dust on contacts was considered by Dr. J. A. Greenwood (Tube Investments, Ltd., Cambridge). Dr. Fairweather discussed the effects of plastic lubricants and the behaviour of granular materials. With these materials, energy losses depend not only on the properties of the material but also on granule dimensions and the structure of the granular boundaries. A description of recent contact research in Japan was given by Prof. G. Matsumoto (Tohoku University). The properties of electrodes of silver-nickel and silver-metallic oxides, produced by powder metallurgy, were described, as well as work on arc suppression by electro-chemical treatment of the electrode surfaces. The selection of electrical contact materials for light-duty applications was surveyed by Dr. V. G. Morradian (Engelhard Industries Inc., New Jersey). The proceedings closed with a summary by Dr. M. R. Hopkins.

The last conference on electrical contacts in Britain was held in 1952 (see *Nature*, 169, 960; 1952), and it is interesting to consider the developments which have occurred since then. Despite hopes that recent developments in electronics, particularly in the field of semi-conductors, might avoid difficulties associated

with conventional metal-to-metal contacts, it is clear that basic problems in electrical contacts are still with us. Some practical problems have been solved, or circumvented, but others have appeared in new forms. However, considerable advances have been made in our knowledge of the physics of the molten metal bridge, its formation, growth and final destruction, and of the micro-arc to which it appears to give rise in certain conditions. At the same time, work in this field is enlarging our knowledge of the properties of metals at very high temperatures.

Another important conclusion can be drawn from this most interesting and worth-while symposium. In the conference of 1952 it was not clear that the engineer concerned with the operation of contacts, and the physicist concerned with fundamental processes, were attacking the problem together; at the present conference there appeared to be far closer liaison between the physicist and engineer, and, further, it was apparent that the designer now fully appreciates methods of approach depending on investigation in controlled conditions of, for example, ambient atmosphere and surface state.

Dr. J. Topping, principal of the Brunel College of Technology, who welcomed and opened the conference, is to be congratulated on the excellent arrangements.

## GAS CHROMATOGRAPHY

THE Gas Chromatography Discussion Group held its third annual general meeting on April 21 at the University of Birmingham. Membership had risen by 75 during the preceding year to 346, including 94 from 18 countries other than Great Britain.

Highlights for the year had been the publication of the first two volumes of *Gas Chromatography Abstracts*, and the very successful third international symposium at Edinburgh the previous June which had attracted more than five hundred delegates from twenty countries. The *Proceedings* had been published in a 466-page volume before the end of the year.

The group is planning another informal symposium in the autumn, and arrangements for the fourth international symposium, this time in Hamburg during June 13–16, 1962, are already well advanced.

The Retention Data Sub-Committee reported that very little data had been submitted to them, and after considerable discussion agreed to consider the usefulness of relative retention data, which require less rigorous control of conditions and would probably be more readily available than the absolute data they had been seeking.

The scientific section of the meeting opened with a welcome by Prof. R. C. Robb.

The first paper was presented by Mr. M. B. Evans on the relation between the retention volumes of unsymmetrical compounds and cognate symmetrical ones. The work has since been published in the *Journal of Chromatography*<sup>1</sup>.

Mr. C. E. Roland Jones discussed technical details in the examination of pyrolysis products, describing a micro-apparatus for use with the Pye argon chromatograph. He illustrated its use in the identification of plastics, especially those which were not amenable to identification by infra-red spectroscopy.

Dr. R. P. W. Scott discussed the effect of temperature on resolution both theoretically and in the light of experimental results. He showed that for any required separation there was an optimum temperature for a given film thickness and this was more marked with thick films of stationary phase than with thin ones; conversely there was an optimum thickness for a given temperature and an optimum combination of both for minimum analysis time.

Dr. I. Halasz read a paper entitled "Quantitative Analysis of Hydrocarbons with Capillary Columns and Flame Ionization Detectors". He had investigated thoroughly a large number of factors affecting quantitative accuracy, and designed a stream splitter which apparently eliminated the uncertainties of previous models since the scores of tabulated results which he produced showed a consistent accuracy of about 1 per cent.

In the discussion which followed, Dr. Kovats produced some quantitative results from 2  $\mu$ l. of rose oil on an unusually wide capillary column used in conjunction with a tungsten filament katharometer. Efficiencies of 40,000–100,000 theoretical plates had been obtained from such columns.

The final paper by J. G. A. Hölscher of the University of Eindhoven was presented by Dr. M. Van Swaay. He was able to show that ionization in argon detectors could be caused by photons from a pulse discharge. Such a discharge caused a current to flow between two electrodes in a mixture of argon and a hydrocarbon, with a time lag characteristic of the velocity of photons rather than metastables, ions from the discharge being screened off by a series of grids.

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<sup>1</sup> *J. Chromatog.*, 5, 300 (1961).