

isation might have to be secured. The various standing commissions of the Union appointed in 1938 were revised to meet the changes of the past eight years.

Public lectures were given by Prof. H. Shapley on the galaxies and by Sir Harold Spencer Jones on Halley and his times. A colloquium on interstellar material was held in which the following took part: B. Strömgren, ter Haar, Struve, Oort, Minnaert, Stebbins, Lindblad, Shapley and (by proxy) Swings. The meeting was thoroughly successful in gaining its main objectives. It was found impossible to fix the date and place of the next general assembly of the Union, but there were indications that it could not take place before 1948.

F. J. M. S.

ANTIBACTERIAL SUBSTANCES PRODUCED BY BACTERIA AND FUNGI

OUR knowledge of the effects of antibacterial substances produced by or derived from bacteria or fungi continues to increase. A new antibacterial substance named 'bacitracin' has been described by B. A. Johnson, H. Anker and F. L. Meleney (*Science*, 102, 376, 1945; and see the *Lancet*, 641, Nov. 17, 1945). It is produced by a Gram-positive aerobic sporing rod, and the crude brew obtained inhibited a hæmolytic streptococcus when it was diluted 1:2,000 to 1:10,000. Some of the most susceptible organisms were β -hæmolytic streptococcus, pneumococcus, some clostridia, anaerobic staphylococci and some strains of anaerobic streptococci. Gram-negative organisms were not sensitive to it. 'Bacitracin' is soluble in water and butanol, unstable to alkali, stable to acid and to heating to 100° C. for fifteen minutes. Impure extracts were not toxic to animals and did not irritate the conjunctiva. A single intraperitoneal injection of it ensured the survival of 80 per cent of mice infected *via* the peritoneal cavity with a streptococcus, but 30-40 per cent also survived after a single subcutaneous injection and 80-90 per cent after subcutaneous injections repeated every three hours. Subcutaneous injections repeated every three hours ensured the survival of 80 per cent of guinea pigs infected with the gas-gangrene organisms, *Clostridium welchii* and *C. septicum*. It is claimed that local treatment of human infections caused by susceptible organisms are comparable to those of penicillin.

The properties of mycophenolic acid, which is one of the metabolic products of *Penicillium brevicompactum*, have been described by Sir Howard Florey and his collaborators at Oxford (*Lancet*, 46, Jan. 12, 1946). Mycophenolic acid is said to be the first antibiotic produced by a mould which has been crystallized. This was done by Gosio in 1896, who obtained it from media on which *Penicillium glaucum* was growing. Mycophenolic acid seldom reaches titres of the order of 1 in 100,000 or more and is more active against Gram-positive than against Gram-negative organisms, but its activity is more markedly affected than is that of other antibacterial substances by the size of the inoculum used. It inhibited *Staphylococcus aureus*, *Streptococcus pyogenes* and *C. diphtheriæ*, but did not inhibit *Bact. coli* or *Salmonella typhi*. It inhibits *in vitro* the growth of many strains of fungi pathogenic to man and plants at titres up to 1 in

80,000, but apparently even strong solutions of it cannot kill these under experimental conditions.

In the same issue of the *Lancet* (p. 44) Dr. A. G. Sanders, another Oxford worker, discusses the effects of the antibiotics mycophenolic acid, aspergillic acid, proactinomycin, cheiroline, claviformin, gliotoxin, helvolic acid, penicillic acid and penicillin upon fungi pathogenic to man, and concludes that claviformin and gliotoxin have a powerful action upon them. Gliotoxin is, however, unstable under certain conditions. Further investigation of aspergillic acid and cheiroline might, Dr. Sanders concludes, produce useful results.

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VISCOSITY OF LIQUIDS AND COLLOIDAL SOLUTIONS

THE third volume of the proceedings in Russian of the conference arranged by the U.S.S.R. Academy of Sciences on the viscosity of liquids and colloidal solutions, held in Moscow in 1941, has now reached Great Britain (Moscow and Leningrad: Academy of Sciences)*. The volume is sub-titled "Supplementary Reports and Articles from the Section on 'The Viscosity of Molten Materials at High Temperatures' ". There are ten original papers and a general discussion on some of these, and on the contributions from the same section published in the earlier volumes.

Of these papers, two are concerned with metals: Polyak and Serge'ev describe an oscillating ball viscometer for aluminium and its alloys, for which metals they also use a capillary viscometer; and Shvidkovskii, Akhmetzyanov, Belyankin and Shushpanov give viscosity-temperature (η/t) curves obtained with a rotation viscometer for steel.

Markovskii discusses the effects of small quantities of MgO, Al₂O₃, SiO₂, etc., on η/t curves for molten calcium carbide, and the remaining seven papers deal with slags and glasses, mostly relating chemical composition to η/t curves. Sokol'skii uses the log log η/t plot, Okhotin gives an empirical formula relating equiviscous temperature to the composition of glasses, and Leiba and Komar' extend their work on slags, published in Volume 1. There is also a further contribution by Leont'eva, who gets good linear relations between crystallization speeds and fluidity of glasses.

Perhaps the most interesting paper is that of Yevstrop'ev, who discusses the viscosity-temperature coefficient of glasses and other molten systems, comparing the usual well-known equations relating η to temperature. With some glasses and certain salts (for example, sodium chloride and silver nitrate), a plot of log η against the reciprocal of the square of the temperature (as proposed by the author in an earlier paper) gives a better straight line than a plot against the reciprocal of temperature itself; but in other cases neither plot appears to be very satisfactory.

It is most unfortunate that, as an inevitable result of the War, the publication of these reports has had to be so long delayed. Perhaps one may dare to hope that the findings of the conference, brought up to date in some suitable form, may before long be made available in English.

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* The first and second volumes were reviewed in *Nature*, 156, 147 (1945).