the several van der Waals bonds. Those molecules which cannot take part in cooperative motion because their complex structure precludes formation of a regular lattice should have high energies of activation (approaching $\frac{1}{2}$ E_{vap}) and positive entropies of activation for flow. This behavior is found with the complex molecules usually associated with lubricating oils at low to moderate temperatures; at high temperatures, where free rotation even of complex molecules could occur, the equations indicate a cooperative flow mechanism. The temperature at which the transition takes place appears to be related to viscosity index.

The viscosity of a high polymer melt was measured over a shear stress range between 50 and 3000 dynes/cm^2 and a temperature range from 15 to 170°C with an estimated precision of $\pm 1\%$ by T. Baron. The error introduced by energy dissipation was shown to be negligible in the present case. The data are well represented by Eyring's hyperbolic sine law. The physical significance of the deduced molecular parameters appears doubtful, however. Equations could be derived for the flow of non-Newtonian liquids in pipes and capillaries which should be useful for the interpretation of results and for process design purposes.

H. P. Lundgren interpreted the effects of chemical agents on the stress relaxation rates of wool fibers in terms of Eyring's flow theory and proposed a rheometric method for the determination of the distribution of stabilizing hydrogen bond which correlates well with the chemically determined distribution. This evidence further supports the view that hydrogen bonds provide stabilization against displacement of chains in protein fiber networks.

The effect of alpha solid solution alloys of aluminum on grain boundary relaxation in polycrystalline specimens has been investigated by J. E. Dorn and C. D. Starr over the temperature range 24–500°C by measuring the frequency of vibration of annealed wires and determining the modulus of rigidity. Of the alloys investigated, Cu-Al, Ag-Al, Ge-Al, Zn-Al, and Mg-Al, only the magnesium alloys were observed to alter the rate of relaxation of the rigidity modulus.

The interrelation of grain size (GS), frequency (ν), and temperature (T) on the ratio of the measured modulus to the unrelaxed modulus was also shown to be $G/G_u = f\ (\nu\ GS\ e\ Q/RT)$. Inasmuch as the activation energy Q for aluminum is, within experimental error, identical, the shift of the relaxation curves of magnesium alloys to high temperatures is attributable to an additional parameter A which appears to be a measure of the different ways the alloy can relax stresses across the grain boundary. Final correlation of the data is therefore based on the function $G/G_u = f\ (A\ \nu\ (GS)^2\ e\ Q/RT)$ which is also shown to be applicable to Ke's data for different metals such as aluminum and iron. A correlation is obtained between the results of this investigation and creep data on the same alloys.

Relations between the fine structure and the flow properties of lithium soap-oil dispersion were described by B. W. Hotten and D. H. Birdsall. They investigated the size and shape of lithium soap fibers obtained by dispersion of various lithium soaps in mineral oil. Strong effects of composition, environment, and of preparative technique could be observed. The texture and the consistency of the soap-oil dispersions (lubricating greases) could be correlated with the average surface area per unit volume of soap that had been computed from the electron micrographs.

The effect of viscosity changes upon the amount of bed-sediment transported in an open channel was discussed by L. W. Neubauer. The viscosity of the water was varied by varying the temperature and by the addition of sugar. The data obtained at elevated temperatures were obscured by the remarkably large influence of thermal convection on the sand flow pattern. A large decrease in sand movement resulted when the viscous sugar solution was used in laminar and in partly laminar flow. Sand transport in open channels appears to be a function of the "shear stress" at the wall. Bed movement begins only above a critical shear stress—still in the laminar regime—and increases with increasing Reynolds Number. Approximate expressions were presented relating the rate of sand transport to shear stress in the laminar and the sub-turbulent regime, respectively.

Professor R. G. Folsom, the Chairman of the Mechanical Engineering Division, provided for a most interesting tour through the hydraulics and the high vacuum supersonic wind tunnel laboratory of the University.

A. Bondi
Shell Development Company

Optical Society of America

Spring Meeting in New York

The spring meeting of the Optical Society of America will be held in New York City at the Hotel Statler on March 20, 21, and 22, 1952. The program, which is to include the usual group of invited papers by eminent authorities in several fields of current interest, will feature an Adolph Lomb Memorial Lecture by W. D. Wright of the Imperial College, London. The meeting will be open to nonmembers of the Society, and all interested persons are invited to attend. Nonmembers may secure copies of the program by writing to the Secretary, Arthur C. Hardy, Massachusetts Institute of Technology, Cambridge 39, Massachusetts.

Network Synthesis

Symposium in April

Modern network synthesis (audio to microwaves) is the subject of a symposium to be held on April 16, 17 and 18, 1952 at the Engineering Societies Building Auditorium (33 West 39th Street) in New York City. This symposium, jointly sponsored by the Polytechnic Institute of Brooklyn and the Office of Naval Research, will summarize the progress to date in the various fields