physician, in the formation of the diagnosis, and in the planning of treatment is most important. As treatment goes on and as follow-up treatment ensues, the assessment of behavior and plans for its adjustment and integration in the family and community shift from the intrapersonal to the interpersonal or social-group level.

We must develop programs to enhance the understanding by physicians and behavioral scientists of the doctor-patient relationship and the interaction between the patient and his social environment. At the same time it is to be emphasized that this will provide a unique opportunity to expose behavioral scientists, especially graduate students in behavioral science, to the behavioral and social problems inherent in the field of medicine.

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Laser Scattering

Approximately 130 scientists attended a symposium on laser scattering in honor of the late Peter J. W. Debye held at Cornell University, 24 to 26 June 1968, under the auspices of the Physical Chemistry Division of the American Chemical Society and the Chemical Physics Division of the American Physical Society. F. A. Long (Cornell University) delivered the opening remarks. Attending the banquet on 25 June were three generations of the Debye family. A. M. Bueche (General Electric), a former student of Debye's, was the after-dinner speaker.

Participants at the conference considered problems related to laser spectroscopy in chemistry and physics with emphasis on techniques which take advantage of the coherent properties of lasers. Speakers drew attention to the use of lasers in physical science; however, they also discussed increasing potential of lasers for research in physics and chemistry as well as in engineering and biology.

Laser research and development have proliferated at a great pace in the last few years. The design and use of lasers draw on experience and knowledge in fields related to physics, such as quantum electrodynamics, electronics, and optics. Consequently, the symposium not only provided opportunities for the exchange of ideas among experts, but

more importantly, it also allowed the novice to learn various aspects of laser scattering from the most able investigators. In order to encourage informal presentations and discussions, it was decided that no proceedings would be published for this conference.

S. H. Bauer (Cornell University) and W. R. Bennett, Jr. (Yale University) reviewed molecular excitations leading to nonequilibrium distributions and the relaxation processes of excited states in atoms; J. R. Airey (Avco) reported on chemical lasers pumped by reactions between halogen atoms and halogen halides. A. Javan (M.I.T.) discussed studies of molecular vibrational relaxation and processes of energy transfer in carbon dioxide.

Stimulated effects resulting from the use of pulsed lasers were discussed by D. H. Rank (Pennsylvania State University) and R. Y. Chiao (University of California, Berkeley). P. D. Maker (Ford Motor Company) reported on inelastic harmonic light-scattering spectroscopy. Ingenious experiments on molecular vibrational and rotational relaxation processes by means of light pulses in the picosecond range, as reported by J. A. Giordmaine (Bell Laboratories) and P. M. Rentzepis (Bell Laboratories), demonstrate techniques of great importance and sophistication for very fast relaxation processes.

Laser Raman spectroscopy was reviewed by S. P. S. Porto (University of Southern California). The advantages of laser over conventional light sources include its monochromaticity and power density. A renaissance in Raman spectroscopy is inevitable, since lasers enable us to study polarized Raman spectra as well as line shapes (R. Gordon, Harvard University; A. D. May, University of Toronto). C. K. N. Patel (Bell Laboratories) discussed the extension of visible laser spectroscopy to the infrared region by the use of CO_2 lasers and nonlinear optics.

J. B. Lastovka (M.I.T.) explained and compared the heterodyne and self-beating techniques in optical mixing spectroscopy. Spectrometers which incorporate features from radio-frequency and microwave spectroscopy have resolving powers of about 10^{14}, exceeding the best optical interferometers by a factor of at least 1 million. Such extremely high resolutions allow observations of small energy changes in the domain of thermal motions of molecules. The time-dependent behavior of collective systems can thus be measured and interpreted with Van Hove's time-dependent correlation functions. Applications include localized velocity of fluid flow, time-dependent fluctuations of density and concentration (G. B. Benedek, M.I.T.; B. Chu, State University of New York at Stony Brook) of systems near the critical point, and transport properties of macromolecules in solution (R. Pecora, Stanford University).

By utilizing relatively high-power densities of continuous wave helium-neon lasers, R. S. Stein (University of Massachusetts) was able to film time-dependent structural changes in stretching polyethylene films. Brillouin spectra of solids (H. Z. Cummins, Johns Hopkins University), liquids (T. A. Litovitz, Catholic University of America; D. P. Eastman, Pennsylvania State University), and gases (N. Ford, University of Massachusetts), as well as shear waves in liquids (B. P. Stoicheff, University of Toronto), demonstrate the tremendous potential of lasers for the study of photon-phonon interactions by means of inelastic light scattering. By the use of single-mode lasers, Fabry-Perot interferometers, and photon-counting techniques, Brillouin spectroscopy has overcome the major experimental difficulties and should flourish within the foreseeable future.

Using the hydrodynamic theory of light scattering from a chemically reactive fluid, Z. W. Salsburg (Rice University) showed the feasibility of measuring extremely fast reaction kinetics by means of laser scattering; this technique makes it possible to bridge relaxation-time capabilities from the ultrasonic range to the 10^{-13} second region in which inelastic scattering of slow neutrons occurs. This approach was demonstrated by a measurement of the relaxation times of hydration of zinc sulfate in aqueous solutions by Y. Yeh (Lawrence Radiation Laboratory, University of California, Livermore).

The final talk by P. A. Egelstaff (Harwell, England) emphasized the limitations of lasers as probes and stressed the advantages of combining laser scattering with neutron scattering, a technique still in its infancy. The delay is partly due to the need for nuclear reactors of very high flux as neutron sources, an investment which few countries can afford.

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