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proach to the study of synaptic relations in cortex was presented by Szentes-
tagothy (Hungary). Experiments on partially isolated cortex suggested that axosomatic synapses on pyramidal neurons come exclusively from local interneurons, whereas axodendritic synapses on the same neurons arise mainly from distant systems.

Several additional papers (Burés, Czechoslovakia, and Zanchetti, Italy) provided a broader perspective of the diversity and complexity of inhibitory mechanisms than is apparent in either studies of single neuron activities or the total behavior of intact animals. Storm van Leeuwen (Netherlands) showed an impressive film of the relation between behavior and electrical activity in various parts of the dog's brain.

The keynote address in the symposium on general principles of self-regulation in cortical-subcortical correlations was presented by Anokhin (U.S.S.R.), whose report on mechanisms of a functional system as a unit of self-regulation summarized 35 years of work along these lines. According to Anokhin, neurophysiological mechanisms of behavioral acts are elaborated through stages beginning with an afferent synthesis formed on the basis of ascending activating influences connected with the orienting reflex. This is succeeded by corticofugal activities, which in turn influence cortical neurons in accordance with the biological quality of the ascending activations. From this stage afferent mechanisms are brought into operation which initiate reverse afferentation. During the course of experiments on these factors, Anokhin and his collaborators have defined specific characteristics of ascending reticulo-cortical activations in terms of different biological and chemical processes. Ontogenetic studies were also cited in support of the view that different afferent pathways activate different types of synaptic organizations of cortical and subcortical neurons.

Self-regulation mechanisms in cortico-subcortical relationships were also discussed by Sager (Rumania), whose notion of cortico-subcortico-cortical reverberating circuits negates the necessity for the existence of special centers for sleep-wakefulness function. Less speculative reports of electrophysiological data on input-output relations at various levels of afferent pathways were offered by Gersuni (U.S.S.R.), Narkhashvili and Kadjaya (U.S.S.R.), and Meschersky (U.S.S.R.). The latter two papers dealt with cortical inhibition and modulation of transmission through specific thalamic relay nuclei.

It is noteworthy that in other communications dealing with the role of the meso-diencephalic activating system in higher nervous activity (Lissak and Endrocz, Hungary), particular attention was directed to the finding that all subcortical facilitatory and inhibitory systems form an inseparable unity with the cortex. Thus, while it may be argued that various subcortical circuits are primarily involved in reinforcement or facilitation of conditioned reflexes, it is at the level of the cortex where integrative closure of all behavioral activities takes place. The report of Rosenblith, Albe-Fessard, Maisson, and Hall (U.S., France) attracted considerable interest. In his introductory remarks, Rosenblith pleaded for the development and use of new analytical methods in neurophysiology that could conceivably provide new information on neuronal organization. The paper dealt with changes in averaged, evoked responses that were recorded during sleep and wakefulness from nonspecific and specific thalamic nuclei and cortex. Preliminary results of this study have indicated that the transition from sleep to wakefulness is accompanied by alterations in averaged, evoked responses to peripheral stimulation, which are most prominent in midline components of the thalamic reticular system. Hugelin and Dell (France) reported on reticular regulation of peripheral and central reflex activities in the context of the general problems of vigilance.

A symposium on evolutionary physiology of the nervous system and brain ontogenesis opened with a general report on the evolution of afferent systems in vertebrates (Voronin et al., U.S.S.R.), which stressed the progressive development of ascending activating systems in vertebrates, the manner in which specific systems develop relative to the specific ecology of different species, and the evolution of axosomatic and axodendritic synaptic pathways at different neural axial sites. Karimyan (U.S.S.R.) continued this phylogenetic analysis in terms of experimental findings on the overt characteristics of specific and nonspecific effects of pharmacological agents on these evoked activities in different species.

In an attempt to broaden the scope of this symposium, attention was directed to several aspects of the development of different biochemical proper-
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7 FEBRUARY 1964  601
ties of the nervous system during phylogenesis. Kreps (U.S.S.R.) discussed the qualitative and quantitatively different characteristics of phospholipids in vertebrates and invertebrates, on the one hand, and warm and cold blooded vertebrates on the other. Vinnikov (U.S.S.R.) considered the structural, chemical, and functional features in sense organs at cellular and subcellular levels of organization. In the only other paper concerned with metabolic properties of developing cell systems, Gutmann (Czechoslovakia) discussed the differentiation of metabolism in muscles of different function during ontogenesis.

The 6-day meeting closed with a series of papers on various aspects of the ontogenesis of morphological, electrophysiological, and pharmacological properties of the mammalian central nervous system and the postnatal development of conditioned reflexes. In considering the different rates of maturation of afferent functions, Scherrer (France) explained how an attempt was made to find out how the behavioral features of immature animals might be explicable, in part, in terms of the excitability and conductile properties of afferent pathways and the progressive elaboration of different synaptic organizations. Comparative studies by Volokov (U.S.S.R.) of the postnatal development of analyzers stressed the different time of appearance of orienting reactions to various stimuli. It was proposed by Sheveleva (U.S.S.R.) that in early stages of postnatal development adrenergic synapses predominate in the brain, whereas during maturation cholinergic synapses increase in number in association with changes in bioelectrical activity and in the reaction of neurons to pharmacologic agents. In presentations from Soviet workers, the importance of ecological factors as determinants of the ontogenesis of different analyzer functions in different species was repeatedly emphasized.

The last session on brain ontogenesis was opened by Mysliveček (Czechoslovakia) who reported on the differential rate of maturation of different components of the auditory pathway to neocortex in the kitten. Lindsey (U.S.) reviewed his long experience with the postnatal development of EEG and relationship to changes in neuronal structure as well as more recent data on evoked potentials in infants and newborn animals. The development of spontaneous and evoked activ-
ity in the rabbit hippocampus was analyzed by Dzidzishvili and Kvirkvelia (U.S.S.R.): they attempted to correlate the appearance of post-tetanic potentiation of evoked potentials with the appearance of convulsant activity in hippocampal neuronal organizations. Finally, Purpura and Shofer (U.S.) indicated how experimentally induced modifications of ontogenetic patterns in cerebral and cerebellar cortex may increase the value of developmental studies aimed at clarifying the origin and nature of evoked potentials.

In order to assess the significance of the Sechenov Conference it should be noted that this meeting was the first of its kind in which all aspects of neurophysiological and behavioral studies carried out in the Soviet Union provided the central themes of the 6-day international meeting. It may be appreciated, therefore, that the occasion of the Sechenov centenary prompted a major effort on the part of various members of the U.S.S.R. Academies of Sciences and Medical Science to indicate the general importance and development of neurobiological research in the Soviet Union in recent years. The papers presented by Soviet workers comprised more than 50 percent of the 6-day program. In broad outline they touched upon all aspects of neurophysiological investigation ranging from classical Pavlovian studies to microphysiological analysis of complex electrocortical potentials. Analytical methods currently employed in Western countries for obtaining quantitative descriptions of neural events are being applied increasingly in many of the larger institutions in the Soviet Union. There can be little doubt that the use of these methods in the studies of higher nervous activity has already yielded significant results and will supplement the traditional Pavlovian approach. Whereas little time was devoted during the meeting to other areas of brain sciences, present-day biochemical and biophysical concepts appeared to play a considerable role in the interpretation of the data.

In addition to the conference, two Sechenov lectures were presented, one in Moscow and one in Leningrad on 25 November and 2 December, respectively. The lectures were given by H. Waelsch on the subject of nitrogen metabolism and cerebral function. He defined the dynamic cytoarchitectonics of the brain in terms of metabolic compartments by the use of examples from the metabolism of ammonia. Fur-
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moments attached to some fraction of the constituent atoms. This model, with which the names of W. Heisenberg, P. A. M. Dirac, and J. H. Van Vleck are associated, is literally applicable only to magnetic compounds, and to rare earth metals, and it is, at best, only the basis for a phenomenology of the "classic" ferromagnets, iron, nickel, and cobalt. Because of their nonintegral spins and large electronic-specific heat, and because of other evidence, notably high field galvanomagnetic measurements on nickel reported by W. A. Reed (Bell Telephone Laboratories), the itinerant-electron concept is expected to be applicable to these metals. Making use of existing calculations of the band structure of nickel in its nonferromagnetic state, H. Ehrenreich (Harvard) and H. R. Philipp (General Electric) constructed a model of the band structure of ferromagnetic nickel which is consistent with the available data.

For the metals of the first transition series, the band theory has yielded the same phenomenology as the Heisenberg-Dirac-Van Vleck model. T. Izuyama (M.I.T.) and R. Kubo (University of Chicago) showed that an itinerant-electron model can account for the existence of spin waves as well as the existing neutron-diffraction data in the neighborhood of the Curie temperature if the electron-correlation effect is taken into account. D. C. Mattis (I.B.M.) also found spin waves in a band picture with the dominant interaction among d-band electrons or holes, taken to be the Hund's rule mechanism of intraatomic exchange.

The long-range indirect exchange by means of conduction electrons is generally invoked in discussions of the behavior of rare metals. F. Holtzberg et al. (I.B.M.) discussed the striking properties of rare-earth group compounds with the ThP₃ structure, relating the Curie temperature to electrical conductivity in the GdSb-GdBi system in terms of this model. Similarly, the ferromagnetic conductor Gd₈₇Se₁₃ becomes semiconducting and paramagnetic when it is doped with Eu₂⁺; it remains conducting and ferromagnetic when doped with Y₂⁺. S. H. Liu (I.B.M.) found that the indirect exchange model leads to a term in the equation for electrical resistivity proportional to the deviation of the magnetization from its ground state value, but unfortunately, no appropriate experimental data are available. This model was also applied to the case of dilute magnetic impurities in a
nonmagnetic conductor. M. W. Klein (Sperry Rand) was able to explain simultaneously the very different dependences of the excess low-temperature specific heat on small concentrations $c$ of iron, cobalt, and manganese in copper. In terms of the indirect exchange model, the different effective spins on these ions in copper, and the limited experimental temperature range, he showed that the result is proportional to $c^3$. $c$, and $c^3$ for manganese, iron, and cobalt, respectively.

In compounds, we have recently seen the development of materials having, from the theoretical point of view, very nearly ideal Heisenberg-Dirac-Van Vleck properties. Joining the very simple antiferromagnet $RbMnF_3$ are the europium chalcogenides on which T. R. McGuire and M. W. Shafer (I.B.M.) reported. For the cubic ferromagnet EuS, S. H. Charap (I.B.M.) used spin-wave theory to determine the exchange interactions between the nearest and next-to-nearest neighbor europium atoms from low-temperature magnetization and specific heat data. An independent test was provided by P. J. Wojtowicz (R.C.A.). He derived an expression for the magnetic specific heat of EuS above its Curie point and showed that the low-temperature constants obtained by Charap, when used in his expression, reproduce the measured high-temperature specific heat within experimental uncertainty. A. Narath (Sandia) discussed the antiferromagnet CrCl$_2$ as ferromagnetic sheets (two-dimensional ferromagnets) antiferromagnetically ordered. He successfully analyzed the sublattice magnetization measured by nuclear magnetic resonance of Cr$^{57}$ nuclei in terms of the spin-wave theory and determined the exchange constants.

The study of the interaction of the magnetic lattice with its surroundings is interesting in its own right and valuable as a tool for studying the nature of magnetism itself. Because of their simple crystalline and spin structure, garnets doped with rare earths provide an excellent opportunity for both the theoretician and experimentalist to study the loss mechanisms in conducting ferromagnetic materials. The losses are experimentally investigated by measuring the ferromagnetic resonance line width. J. H. Van Vleck (Harvard) reviewed the state of the theoretical interpretation of the resonance data on the basis of both a longitudinal (slow) and a transverse (fast) relaxation process. F. Hartmann-Boutron (University
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of Paris) extended and generalized the theoretical calculations of both processes. P. E. Seiden (IBM) presented experimental results showing that over most of the observable temperature range the loss mechanism is of the “slow” relaxation type. However, he pointed out that, for very low temperatures, the “slow” relaxation model is not complete.

The interest in memory applications and fundamental properties of thin magnetic films is continuing to grow (33 papers were presented on the subject). J. I. Raffel (Lincoln Laboratory) discussed the problems of large-capacity magnetic film memories. He pointed out that the prime requirements of the magnetic element are capability of sharing common drive and sense circuitry, small size and low power consumption, and ability to be batch-fabricated. He then described an approach to a 36-million bit, thin-film memory with an access time of less than 1 microsecond at a cost of about 3 mils per bit. Along the same lines, T. J. Mateovich, W. Flannery, W. Luciw, and A. A. Adomines (Univac) discussed a low-power, 64-by-24-bit film memory plane. Output signals of 50 microvolts were obtained with drive currents of less than 35 milliamperes.

Recently, magnetic film elements exhibiting biaxial anisotropy (possessing four stable states of remanent magnetization) have received attention because of their possible storage and logic applications in the computer industry. Three types of biaxial films were treated. H. Chang (IBM) calculated the static and dynamic properties of a biaxial structure formed by magnetostatically coupling two uniaxial thin films. R. J. Prosen, Y. Gondo, and B. E. Gran (Honeywell Research Center) investigated the properties of biaxial films simulated by a collection of small rectangularly shaped isotropic films. W. D. Doyle (Franklin Institute) described a series of torque and rotational hysteresis measurements of single-crystal cobalt films possessing biaxial crystalline anisotropy.

The conference was jointly sponsored by the American Institute of Physics and the Institute of Electrical and Electronics Engineers. A complete record of the meeting is scheduled to appear in the spring as a supplement to the Journal of Applied Physics.

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Meteorological Satellites

Some recent results of the Meteorological Satellite Program, specifically, research with pictures and radiation data from the Tiros satellites, were presented on 27 December during sessions of the 3rd western national meeting of the American Geophysical Union, held at the University of Colorado, Boulder, 26–28 December 1963.

An overall impression gained from the session on satellite meteorology, and also from other sessions, including the general assembly of the Union, was that interdisciplinary boundaries within geophysics are breaking down. This observation, often noted and perhaps trite, doubtless is a well known fact among those of broad background, but its more striking impact upon those of lesser experience may be one of the more desirable aspects of such a meeting. Indeed, it is obvious that the Tiros data in themselves cannot be considered as solely "meteorological": they also have implications for hydrology, oceanography, aeronomy, and space physics.

C. O. Erickson (U.S. Weather Bureau, Washington, D.C.) reviewed selected research results and emphasized the fundamentally different nature of picture data obtained by satellites as compared to conventional meteorological observations obtained at fixed points. Although the data are increasingly useful, the initial problem of how to use them proficiently has been only partially overcome by the numerous case studies relating the Tiros pictures to conventional meteorological analyses.

Tiros pictures yield considerable information, including amounts of cloud cover, the presence of cyclonic circulations, and estimates of atmospheric stability, wind direction, and wind shear. However, the information is still largely qualitative and subjective and may vary greatly in time and space. It appears that further real progress in the use of satellite picture data in weather analysis and prediction will depend increasingly on our ability to make these data more quantitative and objective so that they may be incorporated into numerical models.

Albert Arking (New York University) described an interesting and significant attempt to quantify Tiros picture data. Nearly 1500 Tiros III pictures were analyzed on a digital computer in a study of the global distribution of cloud cover. General agree-
ment with climatological averages was obtained, but there were certain regional differences, for example, greater cloudiness over North Africa. Because of the limited period (3 months) and the inferior quality of the later Tiros III pictures, further study along this line would be very desirable.

James Arnold (Chicago) presented some work of T. Fujita which utilized both Tiros pictures and certain of the Tiros radiation data to give the pattern of equivalent blackbody temperatures. The patterns fit very well, and allow for estimating the height of cloud tops. Although radiation data are not yet available operationally, because of calibration and data-reduction problems, this demonstration of combined potential is significant for the future, especially for tropical areas where data are sparse. Erickson earlier had pointed out that Tiros measurements of outgoing, long-wave radiation had been used in preliminary studies of the earth-atmosphere heat budget and that more extensive data would permit global studies not heretofore possible.

Research with Tiros VII radiation measurements in the 15-micron CO₂ band was described by W. Nordberg (NASA, Greenbelt, Md.). Assuming a uniform mixing ratio of CO₂ with altitude, these measurements were interpreted in terms of mean equivalent blackbody temperatures and gave the gross temperature structure of the stratosphere. A more sophisticated effort, using spectrometer measurements from several narrow intervals in the 15-micron band, is planned for the future. The spectrometer will first be flown from a balloon, and the measurements from several intervals are expected to aid in a more detailed analysis of stratospheric temperatures.

Julius London (University of Colorado) arranged the program for this and other meteorology sessions. The entire meeting was favored by delightful weather for the season.

CARL O. ERICKSON
U.S. Weather Bureau, Washington, D.C.

Forthcoming Events

February
12–16, American College of Cardiology, 13th annual, New Orleans, La. (P. Reichert, Empire State Bldg., New York, N.Y., 10001)
13–14, Texas Industrial Pharmacy Seminar, Austin, (L. R. Parker, Pharmacy Extension Service, Univ. of Texas, Austin)
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19–3. Pan American Medical Assoc., 39th congr., the Americas, during a cruise aboard the S.S. Independence. (J. J. Eller, 745 Fifth Ave., New York, N.Y.)


27–28. Cellular Basis for the Action of Cardiac Drugs, Philadelphia, Pa. (Heart Assoc. of Southeastern Pa., 318 S. 19 St., Philadelphia 3)


27–29. American Acad. of Forensic Sciences, Chicago, Ill. (W. J. R. Camp, 1853 W. Polk St., Chicago 12)


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1-5. Raman Spectroscopy, colloquium, Stuttgart, Germany. (J. Goubeau, Dept. of Chemistry, Technische Hochschule Stuttgart, 7 Stuttgart N)

2-4. Fundamental Cancer Research, 18th annual symp., Houston, Tex. (R. J. Shalek, Dept. of Physics, Univ. of Texas, Houston)


3-5. Raman Spectroscopy, colloquium, Stuttgart, Germany. (J. Goubeau, Dept. of Chemistry, Technische Hochschule Stuttgart, 7 Stuttgart N)

3-7. Inter-American Nuclear Energy Commis, 5th, Valparaiso, Chile. (Pan American Union, Constitution Ave., Washington, D.C. 20006)


4-6. Thermal Radiation of Solids, symp., San Francisco, Calif. (W. D. Harris, Engineering and Sciences Extension, Univ. of California, Berkeley 4)

5-6. Theoretical and Applied Mechanics, southeastern meeting, Atlanta, Ga. (Dept. of Short Courses and Conferences, Georgia Inst. of Technology, Atlanta 30332)

5-7. Macromolecular Colloquium, Freiburg im Breisgau, Germany. (Institut fur Makromolekulare Chemie, Univ. Freiburg, Stefan-Meier-Str. 31, 78 Freiburg im Breisgau)


6-8. Society of Nuclear Medicine, southwestern chapter, Houston, Tex. (S. N. Turiel, SNM, 333 North Michigan Ave., Chicago 1, Ill.)


7-12. Proctology, 16th teaching seminar, Miami Beach, Fla. (J. Reichert, 147-41 Sanford Ave., Flushing, N.Y. 11355)

8-12. Water Resources Engineering, conf., Mobile, Ala. (American Soc. of Civil Engineers, 345 E. 47 St., New York 10017)


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11-12. Instrument Soc. of America, 14th conf. on Instrumentation for the iron and steel industry, Pittsburgh, Pa. (N. F. Simec, Research Laboratory, Jones and Laughlin Steel Corp., 900 Agnew Rd., Pittsburgh 30)
14-15. Endocrinology, 2nd annual symp., Salisbury, N.C. (H. Nushan, Medical Service, Veterans Administration Hospital, Salisbury)
15-19. Microcirculation, 3rd European conf., Jerusalem, Israel. (E. Davis, Capillary Research Laboratory, Hadassah Univ. Hospital, P.O. Box 499, Jerusalem)
17-20. Society of Biological Chemistry, Paris, France. (P. Malangeau, Executive Committee, 4, Avenue de l'Observatoire, Paris 6")
Dissymmetries

Depolarization measurements on polymer solutions were mostly limited, until recently, to the determination of Cabannes factors for correcting molecular weights as measured by the light scattering technique. (In fact, this is the reason that the Brice-Phoenix Light Scattering Photometer has been equipped from the very first model with polarizer and analyser Polaroids). However, several papers have appeared recently which deal with the application of depolarization measurements to the study of conformation and anisotropy of macromolecules in dilute solutions.

V. Kalpagam and M. R. Rao of the Department of Inorganic and Physical Chemistry, Indian Institute of Science, Bangalore, India, in two papers with the title "Depolarization Measurements of Polymer Solutions at High Dilutions" [Journal of Polymer Science, A1, 517, 921 (1963)], have described the results of their measurements of depolarization ratio at an angle of 90° for unpolarized and vertically and horizontally polarized incident light (H, V, and \( \rho \)) in solutions of polystyrene, dextran (vinyl acetate) and poly(methyl methacrylate) in good, poor, and "ideal" (theta) solvents. In addition to depolarization ratios, they also report the intensities of both components of scattered light, \( H_\perp \) and \( V_\perp \), with the incident light being vertically polarized. Quite dilute solutions were used, and very pronounced and characteristic dependence of every measured quantity on concentration was observed. The \( \rho \)-values as well as \( H_\perp \) and \( V_\perp \) were dependent also on the molecular weight of polymers and on the nature of the solvent. These results were discussed in terms of the size and geometry of polymer molecules, their configuration and anisotropy, and the solute-solute and solute-solvent interactions. Comparison with theoretical predictions was also attempted.

Depolarization of scattered light in solutions of linear and branched polysaccharides was investigated by V. S. R. Rao and J. F. Foster [Journal of Polymer Science, A1, 289 (1963)] at the Department of Chemistry, Purdue University, Lafayette, Indiana. Two dextran fractions (molecular weights, \( M_w = 71,000 \) and \( 131 \times 10^6 \)) and one corn amylose (\( M_w = 80 \times 10^6 \)) and dextran-amylose limit dextrin of corn amylose (\( M_w = 33 \times 10^6 \)), one corn amyllose (\( M_w = 42,000 \)), and three potato amyllose fractions (\( M_w = 2.4 \times 10^6, 1.14 \times 10^6 \), and \( 0.27 \times 10^6 \)) were used in this investigation. Concentrations of solutions in aqueous ROH were as low as \( 1 \times 10^{-4} \) g/ml, and for each concentration all of the scattered light at 90° (\( H_\perp, V_\perp, H_\parallel, V_\parallel \)) and the corresponding depolarization ratios (\( \rho_\perp, \rho_\parallel \), and \( \rho \)) were determined. For dextran fractions water was also used as the solvent. With the data obtained from these measurements, it was possible to discuss the observed depolarization ratios with respect to the branching and molecular weight of the polysaccharides, concentration of the solutions and the character of the solvents, and to make a comparison between the experimental results and theoretical predictions considering the intrinsic anisotropy of the segments and the form anisotropy of the molecules.

What is mentioned above the high value of the molecular weight (\( 131 \times 10^6 \)) of one of the dextran samples investigated by Rao and Foster. In this connection, it is interesting to note that the highest molecular weights that have been determined for any soluble or natural polymer, employing the Brice-Phoenix Light Scattering Photometer, appear to be those of certain polysaccharides. Thus, H.-G. Elias [Makromolekul Chem., 27, 192 (1958)], at the Institute for Chemical Technology, Technical University, Munich, Germany, studied light scattering by solutions of extremely large molecules of dextran and recorded molecular weights of 10^10 to 10^14, the latter value corresponding to a radius of gyration of greater than 6000 Å. More recently, B. Laskov and E. Margoliash [Bull. Research Council Israel, Chem. Section, A11, 351 (1963)] of the Department of Experimental Medicine and Cancer Research, Hebrew University Hadassah Medical School, Jerusalem, Israel, reported on the properties of high molecular weight glycogen from rat liver. Glycogen was fractionated and the molecular weights of fractions ranged from 2 \times 10^6 to 4 \times 10^10.

Reassuming our discussion of depolarization, we should like to add that procedures for such measurements have been facilitated by several new optional accessories available with Brice-Phoenix Light Scattering Photometers. These include remotely controlled electric rotators which permit orientation of the polarizer and analyser in the vertical and horizontal planes without opening the lid of the light scattering cell compartment. Presently in development is a new amplifier designed specifically to increase the sensitivity of the photometer. This would be of particular value when the intensities of horizontally polarized components are measured, since these are often very low.

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31-3. American Assoc. of Anatomists, Denver, Colo. (L. B. Flexner, Dept. of Anatomy, Univ. of Pennsylvania, Philadelphia 4)

April


1-2. Methods for Measurement of Weak Beta-Emitters, Karlsruhe-Leopolds-haven, Germany. (Gesellschaft Deutscher Chimiker, Gesellschaftsstelle, Postfach 9075, Frankfurt/Main, Germany)


1-3. Optical Soc. of America, spring meeting, Washington, D.C. (M. E. Warga, OSA, 1155 16th St., N.W., Washington, D.C. 20036)

1-4. National Soc. for Programmed Instruction, annual, San Antonio, Texas. (NSPI Program Committee, Trinity Univ., 715 Stadium Dr., San Antonio, Tex.)

1-5. Latin Oto-Rhino-Laryngology Soc., 15th congr., Bologna, Italy. (G. Motta, Via Modica 6, Milan, Italy)


2-3. Alexander Graham Bell Assoc. for the Deaf, southeastern meeting, New Orleans, La. (R. Tegeder, Utah School for the Deaf, 846 20th St., Ogden)

2-3. Obstetrics and Gynecology, semi-
nar, Gainesville, Fla. (Mrs. D. Miller, Div. of Postgraduate Education, College of Medicine, Univ. of Florida, Gainesville)

2-3. Industrial Applications of New Technology, conf., Atlanta, Ga. (Director, Short Courses and Conferences, Georgia Inst. of Technology, Ga. 30323)

2-4. American Acad. of Oral Pathology, Bethesda, Md. (R. J. Gorlin, Univ. of Minnesota, Minneapolis)


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