

ROCHESTER ACADEMY OF SCIENCE

FIFTH ANNUAL SCIENTIFIC PAPER SESSION

STATE UNIVERSITY OF NEW YORK
COLLEGE AT GENESEO, NEW YORK

COCHAIRMAN: DR. ARCHIBALD REID
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NOVEMBER 11, 1978

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Concurrent Session No. 1 - Ecology; Environmental Science
Archibald Reid, presiding

INFLUENCES OF WEATHER AND TOPOGRAPHY ON WATERFOWL MIGRATION IN THE SOUTHWEST. Robert C. Beason, Department of Biology, State University College, Geneseo, New York.

Radar and visual observations were made on waterfowl migration through the Southwest during 1973 and 1974. The influence of weather on nocturnal waterfowl migration in the Southwest is significantly less than reported for passerine migration elsewhere. Both seasonality and weather variables influence waterfowl migration, but the significance of each is strongly dependent on the specific migration season. Spring migration shows a stronger relation to meteorological factors. The amount of migration was highly correlated with the height of the freezing level, temperature at the surface, cloud height, and following winds aloft. The direction of spring migration was closely related to the direction of the winds aloft at the time of migration. Southerly winds produced northward migration.

Autumn migration was most highly correlated with cloud height and seasonality. There was little correlation of the direction of migration with any of the meteorological variables measured. The poor relationship between migration and the environmental variables is attributed to the study area being the wintering area for most of the waterfowl entering it. Thus, migrants which entered the area were strongly goal oriented and less likely to respond to meteorological cues.

More migration occurred on the Great Plains than in the Rocky Mountains; but within the mountains, geography had little influence on the density or direction of migration. Evidence indicates that waterfowl move over the mountains (up to 2000 m above the surrounding terrain and 3500 m above sea level) rather than around them.

VEGETATION AT THE LOVE CANAL CHEMICAL DUMP SITE IN NIAGARA COUNTY, NEW YORK. Kenneth Dunne, William Leary, and Eleanor O'Hern, Department of Biology, Niagara University, New York.

A plant community analysis was conducted on the Love Canal chemical dump in Niagara Falls, New York. On and immediately adjacent to the heavy clay soil cap used to seal the dump, a gradient of vegetation is found extending from intensely polluted bare soil to apparently normal old field communities. This change occurs within a distance of 50 meters. A solid stand of Puccinellia distans (L.) Parl. with an occasional congregation of Heleochloa schoenoides (L.) Host or Muhlenbergia asperifolia (Nees & Meyen) Parodi surrounds most bare areas. As distance from the bare areas increases or slightly higher ground is encountered, communities composed of varying amounts of Bromus inermis, Daucus carota, and Cichorium intybus are found. Further along the apparent pollution gradient, vegetation is more diverse and is composed of such genera as Bromus, Dactylis, Agrostis, Poa, Agropyron, Melilotus, Solidago, and Aster which characterize old fields in Niagara Falls.

A QUANTITATIVE STUDY OF THE TERRITORIALITY AND SPACE UTILIZATION BEHAVIOR IN THE PAINTED BUNTING, PASSERINA CIRIS. Mark A. Finke, Department of Biology, Gary Towsley, Department of Mathematics, State University College, Geneseo, New York and Charles F. Thompson, Department of Biology, Illinois State University, Normal, Illinois.

A study on the territoriality and space utilization behavior of the Painted Bunting was conducted on St. Catherine's Island, Georgia. The study area was subdivided into 20-m grids. Movements of color-banded birds were recorded for two breeding seasons, 1977 and 1978. The behavior, position, time, and date of each observation were recorded and the relative distribution of the behaviors within the territory was noted.

Analysis indicated that certain behaviors (e.g., singing and foraging) were significantly non-random in their distribution. Other behaviors (e.g., movements of males associated with females) were exhibited with equal probability in any part of the territory and were random in their distribution. It was also shown that certain behaviors (e.g., singing) were concentrated in a small area of the territory, while other behaviors (e.g., foraging) occurred throughout the entire territory. Analyses indicated that each behavior differs significantly in the utilization of space.

A PRELIMINARY STUDY OF THE FEEDING HABITS OF THE BEETLE
DENDROIDES CANADENSIS LATREILLE. Steven W. Hamilton,
Entomology Department, University of Kansas, Lawrence, Kan.
and Carey E. Vasey, Biology Department, State University
College, Geneseo, N.Y.

Dendroides canadensis Latreille is an uncommon beetle species occasionally collected on flowers or under the bark of trees. This colorful insect is a member of the family Pyrochroidae; a group popularly called the Fire-Colored Beetles. The larval stage is more frequently encountered than the adult and is often found under the bark of fallen trees. The life cycle of this insect is incompletely known. The initial purpose of our investigation was to make a complete study of this species' post-embryonic development under laboratory conditions. To achieve this necessitated our knowing what constituted the larvae's diet. Arnett (1968) had stated that D. canadensis larvae were carnivorous. However, numerous species of animals in various stages of development coexisting under the bark with these larvae failed to substantiate this claim. Removal and microscopic examination of gut contents stained with safranin was positive for lignin. Vascular plant tissue as well as fungal hyphal threads were also found. A study of the mouthparts of larvae revealed structural similarities akin to those of well-known plant eating species. These studies offer evidence strongly suggesting that D. canadensis is phytophagous and not carnivorous.

NOVEL GRASSES ON A CHEMICAL DUMP SITE IN NIAGARA COUNTY, NEW YORK.
William Leary and Eleanor O'Hern, Department of Biology, Niagara
University, New York.

A vegetation analysis of the Love Canal chemical landfill in Niagara Falls, New York, has revealed the presence of three grasses previously not recorded from the area. Puccinellia distans (L.) Parl., Helechloa schoenoides (L.) Host, two European introductions, and Muhlenbergia asperifolia (Nees & Meyen) Parodi, an adventive from Western North America, are all common on the dumpsite. Of these only P. distans is well represented in western New York where it has been gathered on saline soils and areas of chemical refuse in Onondaga and Cayuga Counties. In New York State H. schoenoides has previously been recorded only from the metropolitan New York area, while M. asperifolia is a recent and aggressive introduction into Niagara County.

SOME OBSERVATIONS ON THE FEEDING HABITS AND THE REPRODUCTIVE BIOLOGY OF ETHEOSTOMA VARIATUM, E. CAERULEUM AND E. ZONALE. Russell J. Nemecek, Department of Biology, St. Bonaventure University, St. Bonaventure, N.Y.

The feeding habits and several aspects of the reproductive biology of three species of the genus Etheostoma were studied in order to determine how these darter species compete in a seemingly uniform riffle habitat. Stomach analysis were done on a seasonal basis. In the spring, E. variatum relies upon Trichopteran, Tendipedids, Ephemeropterans and Plecopterans. E. caeruleum feed rather heavily upon Tendipedids, while E. zonale feed almost exclusively upon Tendipedids. During the summer, Trichopteran and Tendipedids comprised the bulk of the diet of E. variatum. E. caeruleum became more dependent upon Tendipedids. The Tendipedidae remained the major food item of E. zonale. In the fall, Tendipedids became the major food source for all three species. In the diet of E. variatum, Trichopteran decrease greatly, but Ephemeropterans and Simuliidae increase. The percentages of Tendipedids in both E. caeruleum and E. zonale increased.

The percentages of ovary weight to body weight and the presence of mature or nearly mature eggs indicate that E. variatum completes spawning activity by the first week in June, E. caeruleum by the middle of June and E. zonale by the latter part of July.

Pre-spawning activity was observed in the same riffle for both E. caeruleum and E. zonale. Although eggs were not collected, it appears that E. caeruleum lays its eggs in a gravel substrate beneath cobble size rocks. Current velocity was greater than 150 cm. per second. E. zonale appear to spawn in Cladophora beds where the current velocity was less than 60 cm. per second. Ripe male and female E. variatum were collected together in a riffle with large cobble and boulders present. Current velocities were greater than 150 cm. per second.

Although feeding habits are similar, there appears to be enough variation to limit competition. Different spawning times and locations allow the three species to utilize the same riffle for reproductive purposes.

PLANT COMMUNITIES AS INDICATORS OF CHEMICAL POLLUTION AT SELECTED AREAS IN NIAGARA COUNTY, NEW YORK. Gary Pierce, William Leary, Kenneth Dunne, and Eleanor O'Hern, Department of Biology, Niagara University, New York.

Based on an examination of vegetation at the Love Canal in Niagara Falls, New York, it was suspected that Puccinellia distans (L.) Parl., Heliochloa schoenoides (L.) Host, and Muhlenbergia asperifolia (Nees & Meyen) Parodi might serve as indicators of severe chemical pollution and leaching from chemical dumps. - These three species, particularly the first two, are unusual in the Buffalo area, but are common at the Love Canal. At five additional areas, where chemical waste disposal is known, from one to all three species are common in an ecological relationship like that at the Canal. One further spot where the composition of landfill is unknown has yielded two of the indicator plants. The possibility of locating and monitoring chemical refuse on the Niagara Frontier is suggested by this study.

Concurrent Session No. 2 - Anthropology
S. N. Roark-Calnek, presiding

SOME PROBLEMS IN RESEARCHING CENTRAL ASIAN LANGUAGES AND CULTURES FOR THE PREPARATION OF "A CULTURAL AND POLITICAL HISTORY OF THE UZBEKS" AND "A COMPREHENSIVE UZBEK-ENGLISH DICTIONARY." COLOR IS USED TO EXEMPLIFY INTERPRETATION DIFFICULTIES.

Harold R. Battersby, Department of Anthropology, State University College, Geneseo, N.Y.

These long-term projects have involved considerable multi-faceted research. The originality of the work complicates their compilation. Neither a history devoted to the Uzbeks, nor a dictionary for their language, has been published in English.

Research is complicated by the historically complex ethnic composition of Uzbeks, by the relatively late establishment of Uzbek as an ethnonym, by their still being in the process of absorbing peoples, and by Russification and Sovietization since the 1880s and 1920s, respectively.

Extreme care is necessary to draw correct meanings from the content of materials, both oral and written, gathered from various parts of the world and in different languages, and from peoples of dissimilar lifestyles, including political refugees.

During research, often problems arise from identical phenomena being interpreted, valued, or seen differently by peoples of different ethnicity and status. In the case of ethnicity, this can be vividly exemplified by a color-name chosen from the Uzbek color terms.

THE FOUNDING OF THE AZTEC CAPITAL, TENOCHTITLAN.
Edward E. Calnek, Department of Anthropology,
University of Rochester, Rochester, N.Y.

Recent studies in pre-Hispanic Central Mexican archaeoastronomy by Aveni, Druckers, and others have shown that major site orientations are confined to a narrow band of angles skewed clockwise from the cardinal directions by anywhere from a fraction of 1° to slightly more than 27° . The primary axes of the Aztec capital, Tenochtitlan, were marked by wide avenues - still in use to the present day - which conform to this pattern. The possible significance of these alignments has been controversial. In most cases, hypotheses based on the supposition that line-of-sight orientations marked horizon positions where the rising or setting of prominent celestial bodies could be observed at regularly recurring intervals offer the best possibilities for understanding their intended purpose. Well defined patterns involving two or more such alignments can also be checked against known characteristics of the Mesoamerican calendrical system to see if the time intervals involved coincide. Further questions involving the culturally defined meanings and consequences of such orientations are, nonetheless, left unresolved, since they depend on symbolic codes which cannot be fully deciphered until the metaphysical languages from which they derive are better known. This directs attention to ethnohistorical data which describe the actual founding of known communities as a means for verifying archaeoastronomical interpretations, and for determining how the primary observations required to establish primary site orientations were accomplished.

This paper analyzes historical texts dealing with the founding of the Aztec capital, Tenochtitlan, in which ritual procedures based on esoteric knowledge transmitted within the priesthood are apparently defined. These include references to the identification and sanctification of prominent natural features and locations still identifiable in or near modern Mexico City by the city's founders, all of which can be shown to mark line-of-sight orientations closely associated with the observation of sunrise at intervals determined by the ritual calendar of twenty-day months. The implications of these findings for the interpretation of orientations and alignments at archaeological sites for which historical records are not available are also discussed.

TIME'S DIRECTION: SITE ORIENTATION AND THE CALENDAR IN PRECOLUMBIAN MESOAMERICA: A GENERAL FRAMEWORK. R. David Drucker, Department of Anthropology, State University College, Geneseo, New York.

A. Aveni, S. Gibbs, H. Hartung and others have noted that building and site orientations in pre-Columbian Mesoamerica tend to cluster around a limited number of axes, each of which bears east of Astronomic North.

This paper demonstrates that these particular axes may be generated systematically by correlating the azimuth of sunrise or sunset on particular dates (corrected to the relevant eras in Mesoamerican chronology) with the endpoints of intervals within a common calendric framework built on the Mesoamerican year of 18 "months" of 20 days plus one 5-day month. This calendric framework is based on the 9 "month" (180 day) interval between the Autumnal and the Vernal Equinox and is supported by 16th-century ethnographic accounts of the Mesoamerican calendar at the time of the Spanish conquest.

Of particular interest is the finding that the orientations of the 2 major Central Mexican Highland PreColumbian metropoli of Teotihuacan and Mexico-Tenochtitlan, although not identical to each other, conform to this framework.

INTER-TRIBAL RELATIONS IN THE INDIAN TERRITORIES DURING THE NINETEENTH CENTURY: ANTECEDENTS OF INDIAN ETHNICITY. Sue N. Roark-Calnek, Department of Anthropology, State University College, Geneseo, N.Y.

During the nineteenth century, remnants of what Muriel Wright has estimated as some sixty-seven once-distinct tribal populations were resettled in the Indian Territories (now the states of Kansas and Oklahoma) under the Federal policies of trans-Mississippi removal of the Eastern Indian population and the punitive relocation of hostile Western tribes. In these new settings, Indians of very diverse cultural and linguistic affiliation and historical experience came into contact with each other.

This paper reports on research, begun in 1973-1974 and continued in the summer of 1978, on the structure of inter-tribal relations which evolved in these settings, and on its role in the shaping of a supra-tribal "Indian" ethnic consciousness of kind. It is argued that Indians came to recognize a very complex ethnic taxonomy or hierarchy, in which "tribal" distinctions were redefined as only one level of contrast.

Oral histories, genealogies indicating inter-tribal kinship and affinal networks, and ethnic taxonomy data were gathered in 1973-1974 from Delaware informants as part of a study of the role of dance and other public performances in articulating Delawares into this emerging structure. In the summer of 1978, these data were extended in work with informants of other tribes, and in particular in documentary research conducted at three archives in Oklahoma. Materials from the Indian Archives Department (Oklahoma State Historical Society), the Western History Collections (University of Oklahoma) and the History Room (Bartlesville Public Library) are now in process of coding and preliminary analysis. The materials include censuses, Federal Agency files and correspondence, and the papers of the Cherokee Nation, into which the Delaware were temporarily incorporated. This work is briefly described, and illustrated by reference to Delaware political relations in the later nineteenth century, and how these relations manifest an adaptive redefinition of sub-ethnic boundaries.

Concurrent Session No. 2a - Geography

R. L. Lougeay, presiding

FIELD STUDY OF THE URBAN HEAT ISLAND OF ROCHESTER, NEW YORK.
Mark Gile, Jeff Greenough, Derrick Vile, Earth Sciences, State University College at Brockport, Brockport, New York.

The Rochester urban heat island, as expressed through air temperature measurements, was examined. Field measurements were taken over a relatively short time period as simultaneous transects of Monroe County were made on a clear, calm evening.

Temperatures were observed the night of March 9, 1978 at points along the transects, starting west of Rochester, passing through the city eastward and again on the return trip. Calibrated mercury thermometers were utilized for the measurements. The information is presented graphically and on isotherm maps. Elevations were also observed in the observation network and the effects of elevation are discussed.

RADIOMETRIC HEAT LOSS STUDIES AT STATE UNIVERSITY COLLEGE, GENESEO, NEW YORK. Roy Janson and Ray Lougeay, Department of Geography, State University College, Geneseo, N.Y.

Radiometric measurements of thermal emittance from roof tops, walls, and ground surfaces have been used to identify areas of exceptional heat loss. This study, conducted at the request of the Plant Department at the Geneseo Campus, involved mapping values of apparent surface temperature as detected with a Barnes Inc. infrared thermometer sensitive to emitted radiant energy between 6,500 and 20,000 nanometers. To facilitate map interpretation by Plant Department personnel, final maps portrayed surface temperatures rather than true emittance values. Actual radiant emittance is directly proportional to the fourth power of the absolute surface temperature. Emissivity could be ignored since all surfaces mapped consisted of homogeneous materials. Final computer-generated maps of surface temperature graphically displayed regions of greatest heat loss, identifying those spots needing the most immediate attention for increased insulation.

POTENTIALS OF MAPPING BURIED GLACIER ICE WITH LANDSAT-D IMAGERY. Ray Lougeay, Department of Geography, State University College, Geneseo, N.Y.

Field observations conducted during the summer of 1978, in the Wrangell Mountains of Alaska, reveal information concerning the nature and extent of buried ice when the scene is observed in the thermal infrared spectrum. This information is not available from the visible and near-visible RBV and MSS LANDSAT imagery. When the mantle of morainic detritus is thinner than the diurnal thermal damping depth, strong contrasts between ice-cored moraines and dry glacial drift deposits are present. In addition, simulations of LANDSAT III thermal imagery display strong contrasts between areas of relatively different surface activity within the mass of buried ice. The thematic mapper, planned for LANDSAT-D, will contain one imaging spectral band in the thermal infrared. This imaging system will have a finer spatial and thermal resolution than the thermal band of the multispectral scanner aboard LANDSAT III. LANDSAT III's thermal channel was reported to have been turned off on July 11, 1978 due to system problems.

THE ROCHESTER URBAN HEAT ISLAND. Jonathan Smith, Department of Geography, State University College, Geneseo, N.Y.

In this study the Rochester, New York heat island was observed and mapped by teams from S.U.N.Y. Geneseo and Brockport, using nighttime mobile transects through the metropolitan area. The urban heat island phenomenon is the result of surface modification, artificial energy inputs, and altered energy systems. It is not only an academic problem, but ramifications of such environmental alterations, even on this micro scale, range from intensification of atmospheric pollution to long-term climatic change. In this case ambient air temperature closely correlated with the density of urban land use. Downtown Rochester was found to be 4.0°C warmer than the surrounding countryside on a clear, calm winter's evening.

Concurrent Session No. 3 - Chemistry Physics
K. Nahabedian, presiding

ELEMENTAL ANALYSIS OF SERUM FROM LEGIONNAIRES' DISEASE CASES. James R. Chen and John M. Anderson, Department of Physics, SUNY at Geneseo, Geneseo, N.Y. 14454.

Forty-eight serum specimens consisting of recent "sporadic" cases of Legionnaires' disease in the U.S.A. and controls have been analysed along with thirty serum specimens from the 1976 Philadelphia Legionnaires' disease outbreak for their trace elemental contents. The acute and convalescent Legionnaires' disease specimens had been assayed elsewhere for indirect fluorescent antibody against the Legionnaires' organism. To determine the trace element concentrations the technique of proton-induced x-ray emission (PIXE) was used. A 2 MeV proton beam was incident on each of the serum targets, which were prepared by lyophilizing 25 μ l of the serum on a thin Mylar backing. Characteristic x-rays induced by the proton bombardment were analysed by a Si(Li) detector-pulse height analysis system. Each specimen was analysed both on-line and later on a Cyber 173 computer for its concentration of Fe, Ni, Cu, Se, Br, Rb, Ba and/or Ti. Ph.

The average elemental concentrations were found to be approximately the same for the three groups of sera: acute, convalescent and controls. However (1) the selenium concentrations in the convalescent sera of the cases were systematically higher than in the corresponding acute sera.* This trend was not seen in the controls; and (2) while the nickel levels of the "sporadic" cases were the same as the controls, the nickel levels in the Philadelphia cases were consistently higher than in the controls.†

*P < .003

†P < .001

COMPUTER ASSISTED EXPERIMENTS IN QUANTUM CHEMISTRY
I. THEORY AND APPLICATIONS OF THE PARTICLE-IN-A-BOX
MODEL.* Douglas W. Spooner and Bhairav D. Joshi, Chem-
istry Department, State University College, Geneseo,
NY 14454; and James E. Eilers, Chemistry Department,
State University College, Brockport, NY 14420.

Computer generated data for the ideal quantum mechanical system of a particle-in-a-box will be investigated and discussed. The systems to be investigated are: (1) a particle in an infinite box; (2) a particle in a finite box; (3) a particle in an infinite box with a sloping bottom and (4) a particle in an infinite box with a cosine function bottom. The Expansion theorem, Perturbation theory and their applications will be discussed. The application of the particle-in-a-box model to the visible spectra of conjugated polyenes and other chemical systems will be made. Classical mechanical contrasts will be made when possible and computer graphics will be presented if available.

*This work was sponsored by a grant from State University of New York Research Foundation, Grant No. 125-4006A.

COMPUTER ASSISTED EXPERIMENTS IN QUANTUM CHEMISTRY, II. APPLICATIONS OF THE RIGID ROTOR AND HARMONIC OSCILLATOR MODELS TO DIATOMIC MOLECULES.* Stephen E. LaGrou and Bhairav D. Joshi, Department of Chemistry, State University College, Geneseo, NY 14454; and James E. Eilers, Department of Chemistry, State University College, Brockport, NY 14420.

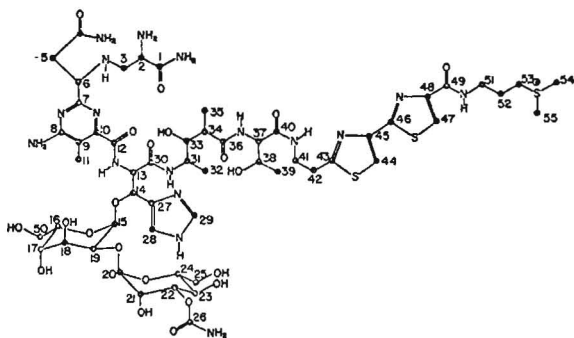
This paper will discuss some of the results obtained from the quantum mechanical treatment of the rigid rotor and harmonic oscillator model systems. It will then develop these results and ideas into an account of various spectroscopic properties of HCl and its isotopes. Among the properties to be discussed are: moments of inertia, bond length, rotational frequency, angular momentum, rotational energy, fundamental vibrational frequency, vibrational force constant, relative populations of vibrational energy levels at various temperatures, and the probability of finding a harmonic oscillator in the classically forbidden region. Particular attention will be paid to the intuitive oddities of the quantum mechanical results.

*This work was sponsored by a grant from State University of New York Research Foundation, Grant No. 125-4006A.

SURFACE TENSIONS OF MOLTEN SALT MIXTURES. Jerry Goodisman, Department of Chemistry, Syracuse University, Syracuse, New York.

Two effects make the surface tension of a molten salt mixture lower than the average (weighted by mole fractions) of the pure salt surface tensions. The difference between the surface composition and the bulk composition (enrichment of the surface in the component with lower surface tension) and its contribution to lowering the surface tension are computed by a formula due to Guggenheim. A long-range effect, connected with the electroneutrality constraint for systems composed of charged particles, is computed in terms of the distribution functions for the system of ions. The assumptions used are those employed in our previous calculations of surface tensions of pure salts. When this effect, which is more important than the surface composition effect, is taken into account, good agreement with experimental results is obtained in the cases studied.

THE ANTITUMOR ANTIBIOTIC BLEOMYCIN A₂: AN ELECTRO-CHEMICAL STUDY. James C. Dabrowiak and Frank S. Santillo, Department of Chemistry, Syracuse, New York, 13210. Dc polarographic and cyclic voltammetric studies on bleomycin A₂ (BLM-A₂), a series of its metallo-derivatives and two of its components, pseudotriptide and an amino acid bithiazole have been conducted. The antibiotic itself exhibits two reduction processes. The first, at -1.22V, has been assigned to the two electron reduction of the 4-amino pyrimidine moiety of the drug. A second multielectron reduction process appears to be associated with the bithiazole portion of the antibiotic. The first polarographic wave, due to the pyrimidine moiety, is sensitive to metal binding phenomena. The binding of Fe(II), Co(II), Ni(II) and Zn(II) to the antibiotic, causes this wave to disappear from the polarogram of the metalloderivative. Thus, for these metal ions the pyrimidine appears to be a metal ligating site. The involvement of this group in metal ligation in the case of Fe(III) is highly dependent on the mode of preparation of the complex. While the Fe(III)-BLM-A₂ complex produced by air oxidation of Fe(II)-BLM-A₂ contains a bound pyrimidine moiety, the complex formed directly by the reaction of Fe(III)(ClO₄)₃ and BLM-A₂ does not. Neither BLM-A₂ nor any of the metalloderivatives exhibited oxidation behavior in the polarographic range studied (+1.5 to -1.8V).



THE REACTIVITY AND PERIPHERAL MODIFICATIONS OF A MACROCYCLIC SCHIFF BASE. David A. Place, John J. Harland, Gerald P. Ferrara and James C. Dabrowiak, Department of Chemistry, Syracuse University, Syracuse, N.Y. 13210

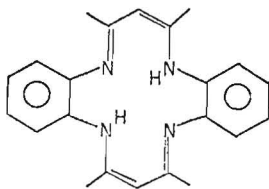
The macrocyclic Schiff base $H_2[14]12eneN_4$ and its nickel(II) complex, $Ni(II)[14]12eneN_4$, were found to undergo electrophilic substitution reactions. The reactivity of the macrocyclic framework was used to synthesize a variety of methine substituted macrocycles. Reagents ranging in reactivity from elemental bromine to ethyl bromoacetate were found to react with the cyclic structure. A series of molecules having chlorine, bromine, and iodine substituted at the methine positions are included in the prepared derivatives.

Oxidizing conditions cannot be used to substitute $Ni(II)[14]12eneN_4$. The ligand framework has a low oxidation potential and it is readily oxidized to a dinuclear macrocyclic complex.

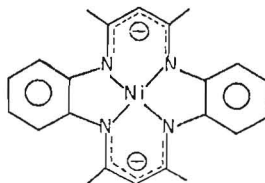
The use of substituted components in the template synthesis was shown to be a viable approach to peripheral modification of $Ni(II)[14]12eneN_4$. Both phenyl and methine substituted components were successfully used to prepare new macrocyclic derivatives.

The complexes that were synthesized were fully characterized using ir, nmr and ultraviolet absorption spectroscopy. The presence of substituent groups on the cyclic framework helped to assign the electronic transitions exhibited by the compounds. For all of the complexes, the two bands which occurred at lowest energy were found to be due to metal-to-ligand charge transfer transitions. A charge transfer band of the opposite sense, ligand-to-metal, was also assigned for the complexes.

LIGAND STRUCTURE



$H_2[14]12eneN_4$



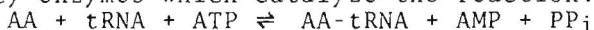
$Ni[14]12eneN_4$

STUDY OF THE RING OPENING REACTIONS OF 4-BROMO-3,4-DISUBSTITUTED-2-ISOXAZOLIN-5-ONES WITH AQUEOUS SODIUM HYDROXIDE. Augustine Silveira, Jr., Department of Chemistry, State University of New York, College at Oswego, Oswego, New York.

3-methyl-4-benzyl-4-bromo-2-isoxazolin-5-one and 4-bromo-3,4-diphenyl-2-isoxazolin-5-one were synthesized from the appropriate β -keto ester by reaction with hydroxyl amine to give the corresponding 3,4-disubstituted-2-isoxazolin-5-one which on halogenation with bromine gave the 4-bromoisoxazolone. The final reaction involved treatment of the resultant bromoisoxazolone with dilute aqueous sodium hydroxide at 0°C and after acidification the product obtained was 2-benzal-3-hydroxyimino butanoic acid. Alternatively, 4-bromo-3,4-diphenyl-2-isoxazolin-5-one on reaction with dilute aqueous alkali at 0°C yielded benzil as the product. Pertinent proton magnetic resonance, infrared, ultraviolet and mass spectral data were used in characterizing the products and possible schemes for the ring opening reactions will be presented.

ARGINYL-tRNA SYNTHETASE: ISOLATION AND INHIBITION. Richard A. Smith and Steven K. Honnold, Department of Chemistry, State University College, Geneseo, N.Y. 14454.

The aminoacyl-tRNA synthetases are a group of twenty enzymes which catalyze the reaction:



Their high specificity is required in order that amino acids may be added to growing protein chains in the proper sequence. We have isolated the arginine-specific enzyme from rat liver, using a purification sequence which includes ultracentrifugation and chromatography on Sephadex G-100, DEAE-cellulose, and phosphocellulose. The enzyme is assayed by measuring the rate of aminoacylation with tritiated arginine. Inhibition studies were carried out in order to determine what portions of arginine molecule are essential for recognition by the enzyme. Preliminary results indicated strong inhibition by arginine esters, and moderate inhibition by amino-acylated arginine. We hope to extend these studies to the development of highly potent inhibitors with potential chemotherapeutic activity.

Concurrent Session No. 4 - Anatomy; Physiology
Carey Vasey, presiding

UPTAKE OF ZINC BY ACHLYA FLAGELLATA. William D. Edinger & John C. Clausz, Biology Department, State University of New York at Geneseo.

Investigations of the uptake of heavy metals by Achlya flagellata agree with evidence from published studies on other types of fungi which suggest a two-stage process of uptake involving an initial reversible binding to a general cation-binding site on the cell wall and a second stage of non-reversible absorption into the cytoplasm.

Achlya is a genus of ubiquitous saprophytic water molds. The present study involves the uptake of zinc, an essential mineral for fungal growth, during the log phase of growth of this fungus. Uptake was measured using Zn-65 as a tracer, and the effects of culture medium, added glucose, and carbonyl m-chlorophenylhydrazone (CCCP - an inhibitor of oxidative phosphorylation) were investigated.

Results showed an uptake pattern similar to that found for other fungi. Initial uptake was rapid, averaging 0.37 nmol/mg dry wt/min during the first five minutes, and maximum accumulation was approximately 8 nmol/mg after two hours. CCCP inhibited total accumulation but not initial binding; glucose added two minutes before the uptake period stimulated uptake. Rate of growth and rate of uptake were both markedly increased using peptone-yeast extract-glucose broth for substrate, as compared to a chemically defined medium.

In preliminary experiments, killed cells were found to have bound zinc reversibly, a phenomenon observed by other investigators, providing further evidence for the presence of cell-wall binding sites.

The movement of zinc into the cell apparently follows Michaelis-Menten kinetics, as found previously for other fungi, lending support to the theory of an active transport mechanism involving glucose metabolism for the uptake of metal cations by the fungal cell.

THE USEFULNESS OF SCANNING ELECTRON MICROSCOPY IN BIOCOMPATIBILITY TESTING. Steven S. Eilenberg, Alfred University, Alfred, New York 14802.

Comparative tests of commercial polymethylmethacrylate (PMMA) and experimental PMMA-alumina bone cements are being performed.

These cements are introduced, unpolymerized, into the medullary canals of live albino rat femurs through large drilled defects. At set post-operative intervals, the animal is sacrificed and the defect area, with surrounding soft tissue, is excised and immediately fixed.

The sample is then gradiently dehydrated, and embedded in a low viscosity plastic resin. The sample is then cut into 100 um sections and is secured to an SEM stub.

The section is observed using the backscatter mode, and the energy dispersive system of the electron probe micro-analysis.

These techniques have proved to be valuable adjuncts to the conventional histologic examinations using the light optical microscope in that they provide a quick assessment of the degree of mineralization, show areas of stress, and delineate the old bone-new bone interface. Currently being explored is the heavy metal staining of the soft tissue which should provide valuable information as to the degree of bio-compatibility and general tissue reaction to the presence of a foreign substance.

STUDIES ON HISTOLOGICAL TECHNIQUES FOR BIO-COMPATABILITY ASSESSMENT. John A. Hipp, Jr., Undergraduate Biology Major, Alfred University, Alfred, New York 14802.

An experimental bone cement (35% Al_2O_3 - 65% PMMA) is implanted into a groove bored into the lateral aspect of adult rat femurs. Commercial PMMA is implanted into a similar groove in the contralateral femur. At the time period under study, the femurs and local tissue are removed. Fixation, dehydration and embedding follow.

Several techniques of preparing these specimens are considered. The parameters evaluated are: clarity at low magnification for gross orientation, preservation of interface features, identification and preservation of the initial features of new bone formation, quantitative and qualitative data on cellular type and organization, and general ease of use. The light and electron microscopes are used to evaluate the preparations.

A COMPARATIVE STUDY OF THREE SPECIES OF ACTINOPHYRD HELIOZOANS WITH PARTICULAR REFERENCE TO THE AXIAL FILAMENTS. Hiram D. Lyon and Edward Ritter, Department of Biology, State University College, Geneseo, N.Y.

The nuclear-axonemal relationships have been important taxonomic criteria in species descriptions of Actinophrys sol, Actinosphaerium eichhorni and Actinosphaerium nucleofilum. Actinophrys is uninucleate and has microtubules arising from nucleating sites on the nuclear envelope. Both A. eichhorni and A. nucleofilum are multinucleate, with the nuclei distributed around the periphery of the endoplasm near the border between the endo- and ectoplasmic regions. The microtubules which form the axial filaments also arise in this area.

The description of A. nucleofilum into a separate species was based primarily upon Barrett's light microscope evidence for the apparent origin of the axial filaments from indentations on the nuclear membrane. A number of investigators have placed this form into a new genus, Echinosphaerium, on the basis of the origin of microtubules, as suggested by Hovasse. The ability to demonstrate origin sites of microtubules on the nuclear membrane is quite clear in Actinophrys. However, our electron micrographs indicate that the microtubules in Echinosphaerium frequently are near indented nuclear areas but appear to arise as readily from nucleating sites in the cytoplasm, as in the genus Actinosphaerium. Thus, if the origin of the microtubules is essentially similar to that seen in Actinosphaerium, then the genus Echinosphaerium should be abandoned and nucleofilum returned to the genus as described initially by Barrett.

OBSERVATIONS ON NUCLEAR MEMBRANE DEVELOPMENT. William M. Marceau and Edward Ritter, Department of Biology, State University College, Geneseo, N.Y.

In an ultra-structure study designed to detect allelopathic effects of the bracken fern, Pteridium aquilinum, on root tip cells of white clover, Trifolium repens, several micrographs indicated structures suggesting the development of nuclear membrane from other membranous material similar in appearance to Golgi.

Tissues taken from seeds germinated in an aqueous solution of KCl, isotonic with an aqueous extract of P. aquilinum fronds, and fixed in permanganate, showed several examples of double membraned structures suggestive of forming nuclear membrane. The membranes ranged from less than semi-circular to almost fully so, and enclosed areas large in proportion to the total cell. These enclosed areas were devoid of vesiculation and contained scattered electron dense material. Where gaps occurred in these membranes, nearby cisternae or vesicles similar to Golgi vesicles frequently appeared to be closing the gaps.

Although Golgi material is known to be involved in cell wall formation and in maintenance of the cell membrane, there is no comparable support for the notion of its involvement in nuclear membrane formation as suggested by these micrographs.

HYPOPHYSIAL AND HORMONAL CONTROL OF ION BALANCE IN THE LAMPREY AMMOCOETE. Barbara A. McCabe, Science Division, Keuka College, Keuka Park, New York.

The effect of hypophysectomy or injection of exogenous hormones on ion balance was investigated in the ammocoete of the fresh water lamprey Lampetra richardsoni.

The results of destruction of separate parts of the pituitary on ion balance were tested by measurement of sodium and chloride ion losses to a low sodium environment (0.075mM NaCl) by ammocoetes that had been loaded with these ions by immersion in a solution of 100mM NaCl, 1mM CaCl₂. Following destruction of the pars intermedia and pars nervosa, ammocoetes lost less sodium in eight hours than did sham operated controls only if the ammocoetes were handled immediately before the loss of ions was measured. When ammocoetes were not handled immediately prior to testing, destruction of the pars intermedia and pars nervosa did not decrease net loss of sodium in eight hours, but rather there was a change in the pattern of exchange: hypophysectomized ammocoetes showed a relatively rapid early loss, followed by a decreasing rate of sodium ion loss; in sham operated ammocoetes, the rate of loss was relatively constant. Following ablation of the pars distalis in animals in which the pars intermedia and pars nervosa were left intact, in experiments in which ammocoetes were not handled immediately before measurement of ion exchange, ammocoetes lost more sodium and chloride ions than did sham operated controls. The result of experiments in which ion exchanges through the gills and kidneys were measured separately suggested that ablation of the pars distalis increased sodium and chloride losses through the gills but not through the kidneys.

Injection of intact ammocoetes with ovine prolactin had no clear effect on the loss of sodium ions two days later by ammocoetes that had been sodium chloride loaded. Injection of arginine vasotocin under the same experimental conditions enhanced sodium and chloride ion losses by the ammocoetes. Administration of this hormone immediately before measurement of ion exchange also resulted in a consistent increase in the loss of ions by ammocoetes that were not loaded with sodium chloride.

EFFECTS OF ANTI-ESTRADIOL-17 β AND FETECTOMY ON OVARIAN AND PLACENTAL FUNCTION IN RATS. E.T. Natoli, S.W.C. Chan, Department of Biology, SUNY Brockport.

Placental hypertrophy in rats following ovariectomy leads to the belief that maternal factor(s) from the ovaries inhibits the development of the placenta. Fetus removal, however, results in retardation of placental growth. The following experiments are designed to clarify the possible role of estradiol-17 β and the impact of fetectomy on placental development as well as their interactions with ovarian function.

males of the same strain. They were given injections of estradiol-17 β antiserum (0.5 ml., i.p.)/0.9% saline on two successive days, starting D-10 of pregnancy. On autopsy the number of conceptuses, fetal weight, and placental weight were individually recorded. Placenta protein and RNA, DNA content were determined. Results indicated that anti-estradiol-17 β significantly increased placental weights; protein, RNA and DNA contents were also significantly increased compared with control rats.

Fetectomy was performed on D-12, 13, and 14 (F-12, 13, and 14), respectively and animals autopsied on D-16, 18, 20, and 22, respectively. Circulatory progesterone levels were measured by radioimmunoassay technic. Fetectomy apparently had no effects on ovarian weights, but placental development was impaired. Serum progesterone, however, was higher in F-12 and F-13 groups compared with controls, but not the F-14 animals.

It is concluded from these experiments that estradiol-17 β secreted by ovaries of pregnant rats regulates placental development by acting as a growth inhibitor. Fetectomy results in reduced labyrinth tissue and therefore retarded growth, but appears to enhance progesterone secretion from the ovaries. Thus maternal-placental-fetal interactions maintain a delicate balance of growth and function in pregnancy.

TISSUE REACTION IN RAT FEMURS INDUCED BY POLYMETHYL-METHACRYLATE (PMMA) OR PMMA- Al_2O_3 BONE CEMENTS. James P. Rausch, Division of Biology, Alfred University, Alfred, New York 14802.

Commercially available polymethylmethacrylate (PMMA) and PMMA- Al_2O_3 composite bone cement samples were mixed on site. These samples were implanted in the medullary cavity through grooves ground into the lateral surface of the femur of adult female, white rats. The animals were killed after periods of 3, 6, 9 weeks; 6 and 9 months.

Recovered femurs containing their defect sites were fixed, dehydrated, and embedded in Spurr low-viscosity, epoxy embedding resin, sliced by a water-cooled diamond saw, hand-ground to 10 μ m on a lap wheel, stained with Paragon 1301 and viewed with an optical microscope.

Photomicrographs of tissue specimen containing PMMA-alumina bone cement showed thinner capsules and in some cases no capsule at all, thus suggesting that the composite bone cement is more biocompatible than pure acrylic bone cement.

These observations, coupled with the improved engineering data indicate an improved cement for possible use in orthopedic applications.

CRYSTALS OF POTASSIUM CALCIUM SULFATE IN THE VEGETATIVE ORGANS OF CAPPARIS FLEXUOSA. Barrett N. Rock, Division of Biology, Alfred University, Alfred, New York 14802.

Crystals in both leaves and secondary xylem parenchyma of Capparis flexuosa appear as different from typical calcium oxalate crystals when viewed with crossed nicols of a polarized light microscope. Analysis of these crystals in situ using the scanning electron microscope and electron microprobe (EDXA) indicates that they are composed of potassium, calcium and sulfur. These crystals are highly water soluble (not characteristic of calcium oxalate crystals) and when a drop of $BaCl_2$ is added to a few dissolved crystals, a white precipitate is formed, suggesting the presence of the sulfate ion. Occurrence of such crystals is restricted to the procumbent ray cells in the wood and is very common, frequently two or more crystals occurring in the same cell. Frequency of occurrence is much less common in the leaves, the only cells containing crystals being upper epidermal cells. Microprobe spectrum data will be presented, along with light and electron micrographs.

OBSERVATIONS ON TWO GENERA OF CILIATES PARASITIC IN VIVIPAROUS SNAILS OF CONESUS LAKE. Jean Q. Wade and Edward Ritter, Department of Biology, State University College, Geneseo, N.Y.

Viviparous snails from Conesus Lake, New York, have been shown to harbor two genera of ciliates, Anoplophrya and Colpidium. The two ciliate types generally occupy different portions of the intestinal tract with Anoplophrya usually found in profusion in the "yellow gland" associated with the stomach and upper portion of the intestine while Colpidium occurs further down the tract, nearer to the anal pore area. The astomate members of Anoplophrya are also frequently encountered in areas containing pink material which have been termed "clouds". These pink clouds are also encountered in the upper portion of the digestive tract.

The cytology of these ciliates has been studied using classical silver impregnation techniques to demonstrate ciliary row patterns and to determine numbers of genera that might be present. Some of the problems that can be encountered using Klein's dry technique are discussed. Ciliary patterns, particularly of the astomates,

were also studied in living material and in glycerine fixed material with the aid of an interference microscope. The latter techniques are also of value in depicting vacuolar patterns and the typical micronuclear and macronuclear arrangements of ciliate structure and taxonomy.

Preliminary ultra-structure studies of the astomates indicate a typical pattern of ciliate structure with confirmation of the single elongate macronucleus and an ovoid micronucleus as seen in the interference microscope. Mitochondria are numerous and appear to be arranged in pairs at the base of each cilium. No Golgi material was seen in our initial micrographs.

At neither the light nor electron microscope level could evidence for pathogenicity be demonstrated. It is assumed, therefore, that these are commensal forms.

A CYTOLOGICAL STUDY OF THE INTEGUMENT OF XENOPUS LAEVIS, THE SOUTH AFRICAN CLAWED TOAD. James D. Dwyer and Edward Ritter, Department of Biology State University College, Geneseo New York and Jay I. Clark, Department of Biology, Ricker College, Houlton, Maine.

Xenopus laevis, an amphibian native to South Africa, is frequently called a clawed toad but is actually a frog and requires a moist habitat. In its native South Africa these frogs undergo aestivation when the rivers and streams dry up and return to the surface of the stream beds with the appearance of the fall and winter rains.

The integument of the amphibian, seen in light microscopy, consists of the typical epidermal and dermal layers characteristic of amphibian material. The thinness of the stratum corneum can be correlated with the shortness of time the adults remain out of water, as indicated by Goin and Goin for other amphibians. The dermal region contains the specialized mucous and poison gland cells as well as the chromatophores which contain the pigment.

At the electron microscope level the cells of the dermal layer reveal two distinct sizes of cytoplasmic granules--relatively uniform small spherical ones and larger irregular shaped granules. The origin and function of these granules is not known. Cells in the lower epithelial layers are interlocked with neighboring cells by multiple interdigitations and show frequent desmosomes. As these cells keratinize and move upward, they become increasingly more dense and filled with tonofilaments. The serous cells of the mucous and poison glands appear as coarse-grained cytoplasmic units.

THE RELATIONSHIP OF CERTAIN FACTORS TO THE CONSUMPTION OF ALCOHOL BY STUMPTAIL MACAQUES (MACACA ARCTOIDES). Mark Andersen Waruch, Dept. of Biology, St. Bonaventure University, St. Bonaventure, N.Y. 14770.

Several factors, thought to be influential in the drinking of alcohol, were correlated with the amounts of alcohol consumed by seventeen stumptail macaques in order to determine their relationship to alcohol consumption in this species of Macaca. Those factors studied were the age, weight, sex, and dominance position of an individual. The amount of stress a monkey was subjected to was also studied, and was measured in terms of the amount of aggression that was directed towards that individual by all other members of the group.

A negative relationship resulted for the correlations between the amount of alcohol consumed by a monkey and its age, weight, sex, and dominance position. Only a monkey's age and weight were found to have a significantly ($p < .02$) negative relationship with alcohol consumption.

The amount of stress a monkey was subjected to, in the form of aggression directed towards him, resulted in a significantly ($p < .01$) positive relationship when correlated to the amount of alcohol consumed by that monkey.

In addition to these factors, the amount of group social tension was also studied to determine its influence on overall group consumption of alcohol. Comparison of group social tension, measured as the total amount of aggression occurring within a group, for two groups of stumptail macaques resulted in a significant difference ($p < .05$). Comparison of the total volume of alcohol consumed by each group revealed that the group with the highest group social tension also consumed significantly more alcohol ($p < .05$).

Concurrent Session No. 5 - Geography; General
D. Q. Innis, presiding

SIR ERNEST RUTHERFORD: ACCENT ON THE NEW ZEALAND YEARS. Donald S. Allen, Professor Emeritus, Eisenhower College, Seneca Falls, N.Y.

Much has been written about the world-shaking atomic physics achievements of Sir Ernest Rutherford at McGill University in Canada, at Manchester and Cambridge Universities in England. Less well known is the story of his boyhood in the then pioneering country of New Zealand.

Here in a country in which large-scale colonization had started little more than 30 years before his birth, the educational foundations for his great work were laid and his remarkable creativity, doubtless stimulated. Even though he was a real red-blooded boy, he was nevertheless, at the end of his secondary school training, at the top of his class in every subject he studied.

While this paper emphasizes the pioneering milieu in which he grew up and briefly outlines his major accomplishments, it also brings out some of the lesser known human-interest facets of his eventful life.

THE INTEGRATION OF LUNR AND SOIL SURVEY DATA FOR THE PURPOSE OF ANALYZING AGRICULTURAL LAND USE PATTERNS. Jon P. Amato, Department of Geography, State University College, Buffalo, New York.

The New York Land Use and Natural Resource (LUNR) Inventory, a state-wide geographic information system, provides land use analysts and regional planners with a valuable research tool. This paper outlines a method for incorporating detailed soil survey information into the LUNR data bank for the purpose of analyzing the relationship between agricultural land use patterns and conditions of the physical environment in the Counties of Erie and Niagara. Information on soil parent material, soil depth, and slope was used to delineate ten landscape types in the study area. The landscape type data encoded to the LUNR system were then cartographically and quantitatively analyzed in association with data on selected LUNR agricultural land use types. The analytical results pertaining to the relationship between landscape type and orchard land use on the Outer Ontario Plain are discussed in order to illustrate an application of the method and its implications for agricultural land use planning.

THE IMPACT OF THE AMERICAN REVOLUTIONARY WAR ON AMERICAN MEDICAL PRACTICE. Richard L. Blanco, Department of History, State University College, Brockport, N. Y.

The Revolutionary War took a heavy toll of American servicemen, and pestilence frequently rendered army regiments inactive for months. During the struggle, the Continental Congress failed to establish adequate medical care, and, consequently, General George Washington's troops suffered intensely from smallpox, typhus, and dysentery.

Yet the War had a definite influence on the practice of medicine. The state assumed more responsibility in providing public hospitals, some minor improvements occurred in wound

surgery; the domestic production of drugs was stimulated, and the apothecary's functions became more specialized. Furthermore, six army doctors published accounts of their observations during campaigns, some states enacted licensing requirements for practitioners, and about 1,400 physicians and surgeons during the War had novel opportunities to observe disease on an unprecedented scale. Clearly, the Revolution hastened the professionalization of American medicine.

PLANT INTRODUCTIONS FROM ABROAD HAVE CONTRIBUTED GERMLASM TO AMERICAN CULTIVARS. Desmond D. Dolan, Northeast Regional Plant Introduction Station, Department of Seed and Vegetable Science, N. Y. State Agricultural Experiment Station, Geneva, N. Y.

This fall the Northeast Regional Plant Introduction Station has completed 25 years of operation. This involved the growing, evaluation, seed increase and seed distribution of 17,500 introductions introduced from all countries of the world. Increase seed lots of each plant introduction are now maintained in a controlled atmosphere seed storage at the Regional Plant Introduction Station. On request, seeds are distributed to cooperating plant breeders, geneticists and crop improvers in the State Agricultural Experiment Stations and also to plant breeders in commercial seed companies. Examples will be given of some of the payoff introductions that have been used in breeding new cultivars or in genetic studies.

Examples of introductions that have valuable genetic traits and have been used in breeding are as follows: (1) A pea from Iran that carried one dominant gene for resistance to Pea Enation Mosaic Virus. This resistance has now been incorporated into three new cultivars. (2) A wild type bean from Mexico that has resistance to root rot. This resistance has now been transferred to several breeding lines. (3) A bean collected in domestic exploration in West Virginia that has resistance to Bean Virus 1, Bean Mosaic Virus. (4) A tiny fruited, wild type tomato from South America carrying resistance to the fusarium wilt organism and also having the fruits rich in vitamin C. (5) Eggplant introductions from Turkey with resistance to the verticillium wilt organism. (6) A cucumber from Korea bearing only female flowers. It has been named gynoeocious and now most seed catalogs have gynoeocious F₁ hybrid cucumbers. (7) Cucumbers from the Orient (China and Japan) carrying several types of resistance to Cucumber Mosaic Virus. Hybrids between the two resistant types had more resistance than either resistant parent. (8) Bush type squashes from both Argentina and Turkey. (9) A squash introduction from Turkey resistant to Squash Mosaic Virus. (10) An alfalfa from Denmark producing a short branched, dense, leafy plant.

THE EFFECTS OF INCREASING POPULATION PRESSURE ON THE ENVIRONMENT IN INDONESIA. Christine Drake, Department of Geography, State University College, Geneseo, N.Y.

Indonesia, the fifth largest country in the world in population size, with approximately 140 million people, is suffering from intense population pressure particularly in Java, where over 88 million people live on a land area only slightly larger than that of New York State. An increase in population of 3 million a year is straining the ability of the country to meet basic human needs whilst the carrying capacity of the environment is being reduced often inadvertently through ecologically unsound practices. Shortened forest fallow periods in areas of shifting cultivation in the Outer Islands result not only in decreased yields but in the ultimate destruction of the potential of the land to support even a minimal population as tough, inedible, and tenacious alang-alang grass (Imperata cylindrica) becomes established in place of secondary growth forest. In areas of sedentary cultivation slopes, which for watershed and groundwater purposes should be left forested, are being cleared and planted, with consequent increase in soil erosion and the lowering of water tables. In wet rice cultivated areas (sawah), particularly in Java, the clearing of steep slopes in an attempt not only to expand the cultivated area but also to meet the acute and increasing shortage of firewood both causes soil erosion that clogs the intricate system of irrigation canals and upsets the normal pattern of water flow. Increasing crop yields through intensification - better hybrids, more use of fertilizer and pesticides, better weeding methods, reduced crop losses during and after harvest, and so on - have great potential for meeting the food requirements of an expanding population; but unless the basic need for fuel for household use is confronted and met, through fast-growing forest plantations or alternative sources such as biogas or direct solar energy, the whole basis of this highly productive and delicately balanced ecosystem will continue to be severely undermined, with potentially disastrous consequences.

DR. SAMUEL A. LATTIMORE (1828-1913), THE MICROSCOPICAL SOCIETY (1879-1881), AND THE FOUNDING OF THE ROCHESTER ACADEMY OF SCIENCE (1881). L.J. King, Biology Department, State University College, Geneseo, N.Y.

The Rochester Microscopical Society developed from a suggestion of Dr. Charles E. Rider with the first conference meeting in Dr. S.A. Lattimore's chemistry lecture room in Anderson Hall, University of Rochester. The first meeting of organization was held in Dr. Rider's office on Jan. 13, 1879, with Dr. Lattimore serving as the first president. Edward Bausch, E.E. Bausch, Ernst Gundlach an optical specialist, and others were early enthusiasts.

The question of establishing an Academy of Science was considered at the time of organizing the Microscopical Society, but it was then deemed best to begin with that area of greatest interest (microscopy) and afterwards extend the scope of the Society, if desired. Records of the Society have been lost, but the annual report (1880) presented at the meeting of Jan. 10, 1881, has been found in the Rochester Daily Union and Advertiser (Jan. 11, 1881). The total membership then was 119, of which 110 were active and 9 honorary. Dr. C.E. Rider was the treasurer. With changing interests a broader society was subsequently formed at the organizational meeting of March 14, 1881, and the Academy was incorporated May 14, 1881. The microscopical group continued as a section of the Academy.

Samuel A. Lattimore was born in Union County, Indiana May 31, 1828, and received his B.A. degree from Depauw University in 1850. He began teaching chemistry in 1860 at Genesee College, Lima, N.Y. In 1867 he became professor of chemistry in the University of Rochester, where he organized the laboratory of analytical chemistry in Anderson Hall - moving later to the Reynolds Laboratory built in 1886. He held many important posts on the State Board of Health, the State Department of Agriculture; having responsibilities involving food and water supplies; and was twice a commissioner on the coinage assay at the Philadelphia Mint. Studies were continued at Harvard College in 1865-1866 and he received in 1873 both the Ph.D. from Depauw University and the LL.D. degree from Hamilton College. He was acting president of the University, 1896-1898, and a charter member of the American Chemical Society. In 1908 at the age of eighty, and after forty-one years of active service he became professor emeritus. He died Feb. 17, 1913.

FLOWER NECTAR AND TREE SAP AS ENERGETIC FOODS FOR POLLINATORS. Edward E. Southwick, Department of Biological Sciences, State University of New York, College at Brockport, N.Y. 14420.

Field investigations showed that the Ruby-throated Hummingbird (Archilochus colubris) feeds on phloem sap in the northern part of its breeding range. The sap food source is contained in holes drilled by Yellow-bellied Sapsuckers in birch trees. Sap is preferred over nectar in flowers by brooding females. Although the hummingbird is the most incessant visitor, other birds and many insects are associated with sapsucker feeding trees.

Sap from trees has 16% sugar concentration and laboratory studies indicated that pollinators can be supported by this food. For hummingbirds tested in the laboratory, total energy consumption remained about the same ($0.16 \text{ cal g}^{-1}\text{hr}^{-1}$) while volume and frequency of feeding depended on the sugar concentration of the feeding solution.

Hummingbirds and many other pollinators are opportunistic sapivores and nectarivores and their distribution may be significantly affected by active summer feeding trees of Yellow-bellied Sapsuckers.

VALUES AND THE PHYSICAL SCIENTIST. John A. White, College of General Studies, Rochester Institute of Technology, Rochester, NY 14623.

Our motivations to do science can be illuminated in two ways, as the logical outcome of certain axiomatic statements about the nature of the world, and in the practice of the "scientific method". It is shown that despite the supremely rational nature of science, both routes are necessarily involved with values in several ways. Thus science, as is shown by Whitehead, Jaynes, and others, is fundamentally similar to religion, each being a quest for authorization for certainty and action. It is desirable that all scientists understand this, so as to give due consideration in their work to the values of others seemingly incompatible with science.

CORN FARMING FOR THE FUTURE. Donald Q. Innis, Department of Geography, State University College, Geneseo, N.Y.

Maximum yields for the amount of nutrients, water, sunshine and space available are not obtained from mechanized farms but from intensively worked small farms using animal power or even human labor as the Mennonites do. Experiments and observations in several parts of the world show that intercropping or growing additional crops in a corn field uses soil, water and nutrients more efficiently, gives greater yields, helps reduce damage from insects and funguses, reduces soil erosion and maintains soil fertility.

Farming in Canada and the United States faces serious problems as fuels and fertilizers become more expensive and non-replaceable resources are used up. This paper, based on the author's field work in Jamaica and India, examines alternative for the future using corn cultivation as an example. Large modern agribusiness farms using increasing amounts of fuel, chemical fertilizer, pesticides and weedicides may continue to develop for a few more years. Much land may come to be owned by banks as farmer's needs for working capital increases. This will make it more difficult to get land back into the hands of small farmers who could conduct types of farming which do not use up non-renewable resources.

Concurrent Session No. 6 - Ecology; Environmental Science
R. C. Beason, presiding

THE AMERICAN CHESTNUT IN WESTERN NEW YORK: CONDITION AND DISTRIBUTION. R.J. Cook, Rochester, N.Y.

A survey of some American Chestnuts (Castanea dentata) in Western, New York.

Trees reported to be C. dentata of flowering age in the study area were visited. Rough measurements were made of trees size. Species identity were confirmed. Locations were recorded. Particular attention was given to whether the Asiatic chestnut blight (Endothia parasitica) was present and if so, whether there showed tolerance or possible presence of hypovirulent E. parasitica) Attention was given to the presence of other C. dentata, past or present, in immediate vicinity of study trees. Other species of trees were noted of each site to get a better understanding of what sort of site C. dentata could be expected on or grown on. Data was obtained from

approximately 25 mature trees in Orleans, Genesee, Monroe, Wayne, Livingston, Ontario, Yates, Steuben, and Allegheny. The results enable the first mapping of the species distribution following the near elimination of the population by the blight.

THE EFFECT OF WIND ON THE PLANKTON POPULATION IN LAKE MICHIGAN AT CHICAGO, David S. DeVault, Joseph Makarewicz, Department of Biological Sciences, State University College, Brockport, N.Y.

In the analysis of long term plankton data from fixed sites it is important to understand the effects of as many environmental parameters as possible. To this end, plankton data collected by the City of Chicago were analyzed to determine the effects of wind direction and velocity on the observed plankton densities at a shore and nearshore station in 1975.

Regression analysis and nonparametric statistical analysis indicate that both wind direction and velocity are important in producing daily fluctuations in the plankton population. Winds with northerly or southerly components appear responsible for increases in plankton densities in proportion to their velocity. This relationship is strongest at the shore where 10.7% of the daily variation in plankton density may be accounted for by the relationship $Y=1071+9.66X$ (significant at .01) where $X=(\text{sine of wind direction} \times \text{velocity})^2$. The variation explainable in terms of wind direction and velocity was only 2.5% at the nearshore site.

THE NEW YORK STATE FRESHWATER WETLANDS ACT: APPLICATION OF PLANT ECOLOGY. Herman S. Forest, Department of Biology, State University College, Geneseo, New York.

The Freshwater Wetlands Act became law in September, 1975, but many details of its administrative procedures are still in the formative stage. A series of proposals for regulations and methodology are offered for public comment and are subjected to the trial and error of practice. The essential requirement is a permit or notification before modifying a wetland. "Wetlands" consequently must be defined, mapped, and evaluated for quality. Plant communities have provided the most meaningful criteria for definition and mapping. Since water regime and quality, aesthetics, protection of uncommon plants and animals, as well as wildlife management are recognized goals of the law, a broad spectrum of wetland communities has been included, from wet meadows to submerged aquatic plants. Certain indicator species are recognized for each type.

Although plant communities certainly appear to be the best descriptors of wetlands, there are serious difficulties in attempting to apply simple generalities to actual cases. In addition, the classes adopted by the State differ from those formulated by the U.S. Fish and Wildlife Service. A strong need is felt for professional level interpretation and criticism by plant ecologists if the law is to be effective and rational.

A PROCEDURE FOR THE QUANTITATIVE ANALYSIS OF MIREX IN FISH FROM LAKE ONTARIO BY CONVENTIONAL GAS CHROMATOGRAPHIC/ELECTRON CAPTURE DETECTOR (GC/ECD) METHODS. Samuel Insalaco, Joseph C. Makarewicz, Department of Biological Sciences, S.U.N.Y. Brockport, Brockport, N.Y.

A procedure is described for the isolation and quantitation of the pesticide mirex from tissues of fish from Lake Ontario. Concentrations of Polychlorinated Biphenyl (PCB) interferences in Lake Ontario fish are generally found to be 5-100 times greater than mirex making the quantitation of mirex by conventional Gas Chromatographic/Electron Capture Detector (GC/ECD) techniques nearly impossible. PCB interferences are nitrated with a 1:1 mixture of fuming Nitric Acid/Concentrated Sulfuric Acid and separated from mirex on an unactivated Florisil column with hexanes. Photo-mirex isomers are also retained intact by this method. Recovery rates range from 87 to 96% and quantitation of peaks as small as 100 picograms have been made.

THE INFLUENCE OF RANGE CATTLE ON A YELLOW-HEADED BLACKBIRD POPULATION. Lorraine Kapilow, Department of Biological Sciences, California State University, Chico, CA.

This particular study observed the entry of range cattle into a fresh water marsh inhabited by a breeding population of Yellow-headed Blackbirds. The Yellow-headed Blackbird population has been studied at this marsh for the past 6 years. The water level has varied from year to year but it has never been so low as the present depth. Cattle have roamed freely in the marsh area for the past 6 years and there have been no records of their entrance into the water or of their consumption of the emergent vegetation. The low water depth is believed to have permitted the cattle to invade the marsh and consume the emergent vegetation resulting in the virtual destruction of the Yellow-headed Blackbird breeding area.

PROBLEMS WITH WATER MILFOIL (MYRIOPHYLLUM SP.) Kenneth J. Korndorfer, Department of Biology, State University College, Geneseo, N.Y.

Over the past century species of Myriophyllum have been reported growing in the Western Finger Lakes and in the two largest bays of Lake Ontario in New York State. Only in a few cases actual specimens exist to confirm reports. Most were collected in the early 1900's. Information is sketchy and much is not known about the distribution and frequency of the genus.

Identification of the different species of Myriophyllum is difficult. Many of the plants reported as being different species may in reality be the same. This problem arises because different vegetative characteristics have been used in the identification process.

Taxonomists, such as Fernald and Ogden, have reported different findings concerning Myriophyllum. Fernald designates M. exalbescens to be the common native American species occupying the waters of Western New York. However, Ogden preferred to regard M. exalbescens as a sub-species of M. spicatum L., a Eurasian species, and said that both were present.

Clausen failed to find either one of these species in Irondequoit Bay in 1939, when Myriophyllum had been known to grow there. This suggests that different species occupied the bay in the early 1900's and now. Has the American species been replaced by the Eurasian or has a hybrid evolved? The single specimen with mature fruits (1909) turns out to fit still another species, M. verticillatum, and, by vegetative characters the present Myriophyllum appears to be the same one.

Recently, study of vegetative characters suggests the existence of two or more Myriophyllum species growing in the Finger Lakes area. Some lakes have a mix of the two or more species, such as Silver, Honeoye and Sodus Bay. Others have only one occurring, these include Canadice, Hemlock, and the inlet area of Canandaigua Lake.

More information is needed about the variability of plants and the reliable differences among species growing in these waters. Preliminary results indicate that neither of the supposed common species M. exalbescens or M. spicatum are predominates in some of the lakes. Certainly, there is little evidence that European species has displaced entire populations of other species in the Western New York waters.

GENESEE RIVER WATERSHED AREA SMALL FISH SURVEY.
Stephen T. MacIntyre, Rochester Gas and Electric Corp.,
Rochester, New York

This study was undertaken as a supplement to the ongoing environmental monitoring program at RG&E Station 3 located on the Genesee River in the City of Rochester. In order to compare small fish species impinged at the power plant to those inhabiting the watershed area, a qualitative investigation in that area was undertaken. Samples were taken at four locations in the watershed area south of Station 3 using a 5' x 10' x 5', 1'4 inch bar seine. Twelve sampling dates from 9/23/77 to 11/18/77 included dates during which small fish were expected to be impinged on the traveling screens. Samples were taken in the Barge Canal at locations both east and west of the Genesee River as well as in both Honeoye and Conesus Creeks.

Species composition of small fish at each location and comparative diversities are addressed as well as a limited quantitative site to site comparison. The results of this study should serve as a supplement to already existing data pertinent to the Genesee River Watershed Area.

ENERGY ALLOTMENT IN REDWING BLACKBIRD EGGS. B.A.
MacVittie, C.F. Thompson, J. Clausz, Department of
Biology, State University College, Geneseo, N.Y.

The eggs of the Redwing Blackbird (Agelaius phoeniceus) were studied to determine the existence of a regular pattern of variation in the size of the eggs within the clutch of an individual. The purpose of the study was to determine whether the last egg was the largest and heaviest and whether any variation in size was due to an increase in the nutrients critical to the growth of the embryo. Particular emphasis was placed upon examination of the fatty acid content of the yolk. Results showed that the eggs do increase in size with sequence of laying. Yolk size, however, did not vary as predicted. Albumen weight did increase directly with egg size.

INVESTIGATIONS INTO THE ALLELOCHEMICAL POTENTIAL OF BRACKEN FERN.
William M. Marceau and Archibald Reid, Biology Department, State
University College, Geneseo, New York.

Field observations on Pteridium aquilinum var. latiusculum (bracken fern) in central New York State indicated that some associated vascular plant species may be affected allelochemically by this fern. Twelve species so indicated were bioassayed for allelochemical effects induced by bracken on their germination phase: Anemone virginiana, Asclepias syriaca, Chrysanthemum leucanthemum, Daucus carota, Hieracium sp., Taraxacum officinale, Trifolium repens, Fragaria virginiana, Fraxinus americana, Achillea millefolium, Cichorium intybus, and Impatiens pallida. T. repens was assayed in lieu of T. agrarium, for which field data indicated inhibition by bracken but for which seeds could not be procured. Seeds generally were collected from wild plants. Selected inhibited and stimulated species associated with bracken were bioassayed for allelochemical effects by germinating their seeds in aqueous extracts of bracken fronds and litter. Controls were distilled water, and solutions of mannitol, KCl, and acetate buffer (sodium acetate/acetic acid) prepared isotonic to the bracken extract to eliminate osmosis as a factor in germination patterns. Daily germination totals were analyzed with the Z-test. Data for T. repens and A. millefolium indicated bracken inhibition. Data for F. americana, T. officinale, A. syriaca, and A. virginiana indicated bracken stimulation.

A VEGETATION SURVEY OF THE BUFFALO MUSEUM OF SCIENCE'S SHALE CREEK NATURAL AREA. Mary Pierce, Department of Biology, Niagara University, Niagara University, New York.

A vegetation survey of the Buffalo Museum of Science's Shale Creek Natural Area was conducted in the late winter of 1978 by a graduate class of Niagara University. This survey shows that the forest is proceeding toward a Beech-Maple-Hemlock climax. About one quarter of the area is mature forest and one half of the area is covered with mid-serie mixed hardwood species (Red oak, Red maple, and Yellow birch in the canopy with Beech and Maple saplings). Much of the remainder of the forest is in early succession with Locust, Black cherry, and Large-toothed aspen in various areas. There is a small grove dominated by Hemlock and Cherry birch. Several large, burn-scarred White pine stumps attest to the earlier history of the region.

A STUDY OF THE PREVALENCE OF HAIR FOLLICLE MITES, DEMODEX FOLLICULORUM (SIMON) AND D. BREVIS AKBULATOVA IN A SELECTED HUMAN POPULATION IN WESTERN NEW YORK (ACARI: TROMBIDIFORMES).
Howard G. Sengbusch and J. W. Hauswirth, Department of Biology, State University College, Buffalo, New York.

A survey was conducted in Western New York to determine the infestation rate of hair follicle mites in a selected human population, and to investigate various epidemiological factors associated with transmission and possible pathogenicity. The sample consisted of 322 volunteers from several local hospitals and the Buffalo State University College. Sebum was expressed from the nasolabial folds, mounted in Hoyer's medium, and examined under phase microscopy. The following variables were studied: age, sex, race, type of birth, postnatal feeding, facial hygiene, and use of corticosteroids. 183 (65.8%) of the volunteers were found to be positive for one or two species, 147 (45.7%) contained D. brevis, 82 (25.2%) had D. folliculorum, and 46 (14.3%) harbored both. Chi-square analysis demonstrated an association (χ^2 , $p = .005$) between the presence of mites and breast feeding. A similar relationship was found to exist with advancing age, where 124 (70.9%) of those 51 or over were infested. All other epidemiological factors failed to disclose any correlations.

Concurrent Session No. 7 - Geological Science
R. A. Young, presiding

COMPOSITION AND STRUCTURE OF CHRYSOPRASE, GREEN AVENTURINE AND BLUE AVENTURINE. Mary Bliss, Dr. Eugene Monroe, Alfred University, Alfred, N.Y.

An analysis of the once popular semi-precious gemstones, chrysoprase, and the blue and green aventurines using light microscope, scanning electron microscope, transmission electron microscope, and x-ray diffraction. The quartz matrix of green aventurine was identified as containing fuchsite, a green chromium mica, almandite garnet, and trace rutile all in crystal form. The coloring agent in the blue aventurine, also based on quartz, was identified as dumortierite, along with sericitic mica, a weathering product of dumortierite. New evidence is offered as to the coloring agent of quartz in chrysoprase, a point of conflicting opinion. Scanning electron microscopy and x-ray diffraction tentatively identify the coloring mineral to be a serpentine known as garnierite. This confirms Russian data identifying nickel in the plus two oxidation state. It is also supported by the fact that chrysoprase occurs in serpentine beds.

STUDY OF A DREDGED CHANNEL: BRADDOCK BAY, NEW YORK.
Robert W. Adams and John E. Hubbard, Department of
The Earth Sciences, State University College,
Brockport, N.Y.

Shallow water at the mouth of Braddock Bay periodically limits its use for boating. This led to the authorization of dredging a channel between the bay and Lake Ontario during the summer of 1977. A study of the dredging effects was conducted following the dredging operation.

Surveys were made to (1) locate the channel, (2) determine the characteristics of the sediment disposal area, and (3) describe the adjacent bay and lake floors. Sediment samples from each area were analyzed to characterize the particle size distribution with respect to inferences of sediment transport processes at work.

The studies demonstrate that the channel was filled in and the disposal materials have been dispersed within a period of less than one year. Evidence of what took place is presented with hypotheses to suggest the cause for the movement of sediment into the channel.

BARINOPHYTON CITRULLIFORME, A VASCULAR PLANT OF UNCERTAIN TAXONOMIC AFFINITIES FROM THE UPPER DEVONIAN OF PENNSYLVANIA. David F. Brauer, Department of Biology, State University College, Geneseo, N.Y.

Fertile specimens of Barinophyton citrulliforme were collected from a Famennian locality in Pennsylvania. A fertile segment of the plant consisted of a main axis that bore up to eight spirally arranged strobili. Each strobilus had two rows of alternate sporangiferous appendages that recurved below the strobilar axis. One large, heterosporous sporangium that produced both microspore and megaspores was borne inside the curve of each appendage. The microspores ranged from 33.0 to 48.5 μm in diameter and the megaspores from 700 to 900 μm in diameter. This is the first species of Barinophyton shown to be vascular. The vascular cylinder of the main axis of the fertile segments was an exarch protostele composed of seemingly annularly thickened tracheids. However, when examined with the SEM, the tracheids were shown to have a continuous secondary wall that invaginated at regular intervals to form the thickenings. The core of the thickenings was hollow, so the thickenings were U-shaped. Between the thickenings the wall was covered by minute pit-like structures.

PLEISTOCENE GEOMAGNETIC SECULAR VARIATION IN WESTERN NEW YORK. William J. Brennan, Department of Geological Sciences, State University College, Geneseo, N.Y.

Paleomagnetic studies of Pleistocene lake clays deposited in proglacial lakes which existed during the deglaciation of Western New York have revealed new information on the secular variation of the geomagnetic field. Measurement of remanent magnetic vectors and alternating current demagnetization have confirmed that the clays carry a stable detrital remanent magnetization (DRM) which records the geomagnetic secular variation that occurred during the deglaciation which ended approximately 12,300 years ago. In some localities, the basal clay-rich portions of the Pleistocene tills upon which the clays were deposited also carry a stable DRM.

Oriented samples of the lake clays have been collected from immediately above the till-lake clay contact at each sampling site. As a result, the age of the lake clays collected at an individual site is the same as the time of the transition from deposition of till to deposition of lake clay which occurred as the ice front retreated past the site. Thus, the paleomagnetic direction determined for each site represents the direction of the geomagnetic field at the point in time when the ice front retreated past the site.

The paleomagnetic inclination recorded in the lake clays is approximately 30° to 40° less than that of the present geomagnetic field which suggests that an inclination error is present in the record. As observed in other studies of this type, the paleomagnetic declination record appears to be more reliable and therefore more useful as a magnetostratigraphic indicator.

Preliminary results obtained from sampling sites located along the path of retreat of the ice front demonstrate that the geomagnetic declination has varied from 27° when the ice front was near the southern limit of glaciation to 311° when the ice front was located just north of the present shoreline of Lake Ontario. These results indicate that a record of the geomagnetic secular variation will be of considerable value in the correlation of widely scattered exposures of Pleistocene lake clays and till in Western New York.

GEOGRAPHIC DISTRIBUTION OF THE EURYPTERUS PITTSFORDENSIS
EURYPTERID FAUNA, PITTSFORD SHALE, UPPER SILURIAN OF
WESTERN NEW YORK STATE Samuel J. Cieurca, Jr.

During the deepening of the Erie Canal in 1897-1898, Clifton J. Sarle discovered an unusual eurypterid fauna in strata lying between the Lockport Formation and the typically red Vernon Shale (basal Salina Group). This strata, usually referred to as the Pittsford Shale or phase, contains several eurypterid genera. Two forms, however, characterize this interval, viz. Eurypterus pittsfordensis and Hughmilleria socialis. Because the Pittsford Shale is usually never exposed, it is important to note any new occurrences of this stratigraphic interval.

Reinvestigation, during the past several years, shows that the Pittsford Shale is much more widespread in occurrence than heretofore known. Several new localities were discovered. Many of these form a cluster around the originally defined site, i.e. the Erie Canal excavation behind the Spring House on Monroe Avenue. These provided numerous specimens of Hughmilleria, and rarely Eurypterus. Another new site several miles to the west (near North Chili) revealed only the presence of Eurypterus. This is also true of the new locality at 'Gananda' several miles to the east. A study of numerous fragmentary remains collected by R. Hamell, and kindly given to the author, and numerous other remains collected, indicate only the presence of Eurypterus. Both of these sites show primarily a dark, black to greenish black, matrix.

It appears that both eurypterids occupied distinct habitats. Communication between the habitats, or at least access to a common site of burial and preservation, is indicated by the presence of both Hughmilleria and Eurypterus in some layers. Detailed study of the fossils obtained from these new sites is in progress.

A NEW OCCURRENCE OF THE SULURIAN EURPYTERID:
EURYPTERUS PITTSFORDENSIS. Richard D. Hamell,
Department of Geo-Sciences, Monroe Community College,
Rochester, N.Y.

During the initial stage of the development of the "Town" of Ganada in Wayne County, subsurface bedrock was exposed. The strata observed is of similar lithology to the Pittsford Black Shale that was discovered during the enlargement of the Erie Canal behind the Springhouse Restaurant in Pittsford, New York. Bases for this correlation is on lithology, stratigraphic position (overlying the Lockport Dolostone), and the presence of the eurypterid: Eurypterus pittsfordensis.

The sequence of strata at Pittsford had yielded a wide variety of unusual and unique extinct chelicerates; Eurypterus pittsfordensis being the characteristic species. At the Ganada Site only one species has been recognized (E. pittsfordensis) and no other fossils have been found. The Ganada locality is only one of the most recent discoveries that have given support to an areal extent of this lithology.

THE ALFRED SHALE: A PROBLEM IN PALEOECOLOGICAL INTERPRETATION. Daniel B. Sass, Department of Geology, Alfred University, Alfred, New York 14802, Robert A. Condrate and Timothy R. Alderfer, New York State College of Ceramics, Alfred University, Alfred, New York 14802.

A starfish bed containing a single species tentatively designated as Furcaster leptosoma (Salter, 1857) by F.H.C. Hotchkiss (personal communication) lies at or near the base of the Alfred shale at 1561.06' AT. The ophiuroids occur in profusion only on this horizon and appear in life or near-life positions. Smothering may have been a principal factor in their preservation as has been suggested for similar beds elsewhere by Goldring and Stephenson (1972). However, the analyses of approximately 20 trace elements and the mineralogy of the starfish and succeeding beds seems to indicate a possible change in geochemistry and sedimentation as causes for their disappearance from the succeeding paleoenvironments.

A STUDY OF SILURIAN PHOSPHORITE NODULES, WESTERN NEW YORK. Hoyt B. Sutphin and P. D. Boger, Department of Geological Sciences, State University College, Geneseo, N.Y.

The occurrence of nodules in the Silurian rocks of western New York is well documented. The nodules are described as being phosphoritic, although the available literature does not include a specific mineralogical analysis. The main objective of this study was to determine the specific mineralogical composition of these nodules. Additional objectives were to compare the mineralogical compositions from laterally equivalent units in order to test for regional differences, and to compare the mineralogical compositions of nodules collected from different horizons in order to determine changes in the chemical environment of formation as a function of time.

The Clinton Group (Silurian) rocks of western New York contain several phosphorite-bearing units that are laterally continuous. Nodule samples were collected from the Williamson Shale of the Upper Clinton as well as from the Brewer Dock Limestone and Maplewood Shale of the Lower Clinton. The Maplewood Shale was sampled at two exposures approximately four miles apart.

The mineralogical composition of the nodule samples was determined from strip-chart recordings of the x-ray diffraction patterns. The criterion for positive identification was the matching of at least three major peaks with the data listed in the ASTM Powder Diffraction File. The results of this identification procedure indicate that the major phosphorite mineral is fluorapatite, $\text{Ca}_5\text{F}(\text{PO}_4)_3$. The diffraction patterns suggest the presence of another phosphorite mineral which has been tentatively identified as liroconite, $\text{Cu}_2\text{Al}(\text{As}_9\text{P})\text{O}_4(\text{OH})_4 \cdot 4\text{H}_2\text{O}$. All of the nodule samples analyzed have the same mineralogical composition, which implies that the chemical environment of formation was both widespread and recurring.

SIGNIFICANCE OF THE REMAINS OF A PLEISTOCENE PECCARY (PLATYGONUS COMPRESSUS LE CONTE) BENEATH GLACIAL TILL IN LIVINGSTON CO., N.Y. R.A. Young and J.W. Scatterday, Department of Geological Sciences, State University College, Geneseo, N.Y. and Lawrence Hill, Linwood, N.Y.

The nearly complete skeleton of an immature peccary was recovered in July 1978 from a sand and gravel pit owned by Lawrence Hill. The bones were located in a disrupted section within ripple-laminated, silty sand beneath a compact, gravelly till. The pit is near the summit of a small moraine at an elevation of 930 ft. An irregular area surrounding the bones exhibits complete destruction of the stratification throughout the 20-foot exposure below the till. Around the outer edge of this structureless zone, the laminae are convoluted, upturned or irregularly contorted, and they show evidence of quazi-liquid behavior. The contact between the disrupted zone and the adjacent beds varies from sharp to gradational and from vertical to horizontal or overhanging. The degree of fluid deformation of the beds increases inward toward the edge of the disturbed zone. Another similarly disturbed section is present in the same pit a few yards north of the bone site. Both sedimentary structures indicate "quicksand" conditions. The elevation and topography of the site require the presence of a nearby ice sheet and glacial meltwater to explain both the stratified sand deposit and the hydrology. Hydrostatic pressure could have been caused either by loading from nearby ice or by escaping subglacial meltwater. The overlying till indicates an ice readvance over gravelly outwash after the time of burial.

Although the disturbed zones bear a superficial resemblance to some fossil ice-wedge fillings, they are quite dissimilar. A quicksand condition would explain the excellent preservation of the bones.

Tooth eruption studies on the modern peccary, Pecari tajacu, permit assignment of a 9-10 month age for the individual. An older animal might have avoided the quicksand. The sedimentological evidence confirms the conclusions of other workers that these animals are not indicative of warm interglacial climates as had been previously assumed. An age determination could provide much needed control on the timing of the late glacial readvances in western N.Y.

MARION FISH SCHNEIDER

FELLOW
1978

Marion was born in East Rochester, one of five children and a descendant of one of Rochester's earliest settlers. After graduation from East High School at age 16, she was accepted at both Albany State and Columbia University, but both stipulated waiting a year to enter. During that year she took a business course and was offered a job at Rochester Telephone Corporation just when she was preparing to leave for Columbia. Her father's business had failed and she was needed to support the family, so Marion gave up her formal education and entered the business world.

In 1936 she married Ronold Schneider, a builder and real-estate broker, and quickly became Secretary-Treasurer of his business, a position she still holds. They have four children, now all grown and away from home.

Through the years Marion's life-long interest in plants and what they do has continued to surface. She has had a leading role in the evolution of the Poison Control Center in Rochester. Beginning as a telephone volunteer, she became the plant consultant in 1960, and has written a Poison Plant Book, used as a reference at the Poison Control Center since 1962. The book is now in preparation for publication. She also was instrumental in organizing a volunteer network for the center which is now a part of the Lifeline network.

As a result of her years of self-taught plant study, she is the author of many articles, and is a lecturer for the Red Cross, the Medical Society and the Poison Control Center. She has taught a course on Edible Plants for the Rochester Museum and Science Center. When she joined the Botany Section of the Academy several years ago, she immediately became a Life Member of the Academy and began to work. She was Vice-Chairman of the Botany Section from 1975-1977 and is currently Chairman. She set up a well-received display on edible plants for the Science Exploration Days at St. John Fisher College in 1977, and plans to repeat the exhibit in 1978.

For her continuing enthusiasm and dedication in disseminating information on helpful and harmful uses of plants, and for her perseverance in attaining these goals, we are proud to elect Marion Fish Schneider a Fellow of the Rochester Academy of Science.

WILLIAM LEO HOLLINGSWORTH

FELLOW
1978

William L. Hollingsworth was born in Los Angeles, but grew up in Zanesville, Ohio, and graduated from Ohio State University with a B.A. degree in Geology. His work with IBM took him to five cities in nine years before he settled in Rochester with Eastman Kodak.

A few years after joining Eastman Kodak Company, he joined the Rochester Academy of Science Astronomy Section. After 33 years of service at Kodak as a Senior Development Engineer specializing in the design of optical testing equipment, he retired in 1976. He has not retired from the Academy, however but continues to contribute his knowledge and enthusiasm to enrich the lives of his fellow amateur astronomers.

In June 1954 he was a member of an expedition to Iceland to time and photograph a total solar eclipse. The expedition was sponsored by Georgetown College Observatory and the U.S.A.F. Geophysical Directorate.

For many years William was active in pictorial photographic circles, teaching and exhibiting, and still acts as a judge occasionally. He is a member of the Rochester Theater Organ Society, the Genesee Fossil Club, Kodak Genealogical Club and the David Freeman Audio-Visual Circle. This last is a worldwide organization whose members create slide shows with taped commentaries for circulation around the world. At present he is the North American representative of the organization, which is headquartered in England.

William has served as Vice-President and President of the RAS Astronomy Section and he has been a Councilor of the Academy. He is currently serving as Academy Representative to the Rochester Council of Scientific Societies and is our incoming Academy Vice-President. He and his wife Marie have three grown children.

In recognition of the contributions, support and enthusiasm of this many-faceted person, we are proud to elect William Leo Hollingsworth a Fellow of the Rochester Academy of Science.

WARREN LEWIS LLOYD

FELLOW
1978

A life-long interest in birds which was sparked by the acquisition of a Boy Scout Merit Badge on birds marks our candidate for Fellow. As a teenager he would don a knapsack, pick up his three power field glasses and his copy of Chester A. Reed's bird book, and hike the five miles to the lakeshore from his Webster home. There he would observe bird migration, look for resident birds and add to his fund of knowledge about bird behavior. While no longer dependent on foot power alone, he still pursues birds with vigor.

A new member of the Academy and the Genesee ornithological Society since 1959, Warren immediately became a member of the Field Trip Committee, served as chairman for several years and is still a member. He is present on most field trips offering rides to those without them or taking newer members along to acquaint them with different areas or to teach them where to find certain birds. He has been co-leader on trips as far afield as the Adirondacks, Cape Ann in Massachusetts and Brigantine National Wildlife Refuge in New Jersey.

When the Academy published "Getting Acquainted With Birds in Genesee Country", Warren wrote the Webster Park section, and his great familiarity with every nook and cranny was reflected in the detailed directions. He has co-authored two articles for the birding Baedeker which the Federation of New York State Bird Clubs is soon to publish.

He served as president of the G.O.S. in 1972 and 1973 and from 1974 to 1977 he served as Councilor of the Academy. Ever loyal to the Academy and the G.O.S., he worked tirelessly to help resolve the membership controversy that arose after he left the presidency.

Interested in all phases of birding, Warren is particularly interested in the hawk migrations which take place along the south shore of Lake Ontario. Most favorable spring days will find him at Hawk Lookout at Braddock Bay State Park helping to tally birds. He serves as liaison with the Hawk Migration Association of North America and is a charter member of that group. He is affiliated with other birding groups on the state and national level.

A skilled craftsman in his field of refinishing and repairing furniture, he turns damaged and broken pieces of furniture into things of beauty in which their owners take immense pride. His knowledge of wood equals his knowledge of birds.

For his dedication to extending the knowledge of birds in the Rochester area, for his loyalty and service to the Academy, for his interest in the out-of-doors in general and particularly in helping to preserve special areas of unusual natural interest, we are happy to elect Warren Lewis Lloyd a Fellow of the Rochester Academy of Science.

ROCHESTER ACADEMY OF SCIENCE

P.O. Box 1742
Rochester, New York 14603

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INVITATION

The Rochester Academy of Science invites its members and friends to the celebration of its 100th birthday, to take place Saturday, April 11, 1981 at the University of Rochester River Campus

Afternoon program:

Colloquium on the Geology of the Genesee Region with the following talks:

"Fairchild's New York: Landscapes and Concepts from the Past Revisited", Dr. Lawrence Lundgren, University of Rochester, Rochester, N.Y.

"Geologic Environments of the Rochester Shale: A New Look at the First-named Rock Unit in America", Dr. Carlton E. Brett, University of Rochester, Rochester, N.Y.

"Ancient Geologic Environments in the Genesee Valley: A Regional Perspective", Dr. Thomas X. Grasso, Monroe Community College, Rochester, N.Y.

"Glacial Geology in West-Central New York: Progress Since the Pioneering Studies of H. L. Fairchild", Dr. Ernest H. Muller, Syracuse University, Syracuse, N.Y.

"The Geologic Evolution of the Genesee Valley and Early Lake Ontario: A Review of Recent Progress", Dr. Richard A. Young, State University College at Geneseo, Geneseo, N.Y.

Dinner at Wilson Commons, followed by awards and recognitions.

Evening Speaker:

Dr. Thomas C. Dunstan, Western Illinois University, Macomb, Ill , on the subject "Eagles Through the Seasons".

The celebration will also be the occasion for the release of a special Centennial issue of the Proceedings, containing a history of the Rochester Academy of Science's first 100 years, written by Reginald W. Hartwell, F.R.A.S., 1958.

Further details will be announced in the Academy Bulletin.