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Concurrent Session No. 1 - Physiology
Gustav Garay, presiding

EFFECT OF AIR FLOW ON OXYGEN CONSUMPTION IN MICE. David R. Carlson, C. F. Herreid, and E. H. Schlenker, Department of Biological Sciences, State University of New York at Buffalo, Buffalo, New York.

Animal O_2 consumption studies traditionally use either an open flow or closed system. The high sensitivity and accuracy of paramagnetic O_2 analyzers has favored the use of the open system in recent years. The present study examines the effect of various flow rates on the metabolism of Mus musculus. The O_2 consumption and CO_2 production were measured using a Scholander 0.5 cc gas analyzer. Metabolic rate was determined at flow rates from 50 cc/min to 1,400 cc/min at three ambient temperatures (13°C, 23°C, 33°C). A significant increase in metabolic rate was found with increasing flow rate at all three ambient temperatures. Possible causes for this increase as well as the importance of standardizing flow rate in future studies will be discussed.

THE TERATOLOGY OF AMARANTH DYE (FD&C RED #2) AS AFFECTED BY ANTIBIOTICS. G. Chmieliwski, K. L. Foster, and J. V. Logomarsino, Department of Biology, State University College, Geneseo, New York, 14454.

Amaranth (FD&C Red #2) has long been the subject of controversy as to its teratogenic effects. Research has shown that gut microflora is capable of the breakdown of the dye into harmless byproducts. The teratogenic effect of amaranth in the presence of antibiotics was tested in two studies in an attempt to relate amaranth toxicity to reduced gut microflora.

Study I and Study II involved 25 and 28 mature virgin rats, respectively. Female rats were housed with male rats until pregnant, as indicated by the presence of vaginal sperm (day one of experiment). Animals were divided into four treatment groups: Group A, control; Group B, antibiotics; Group C, amaranth; Group D, amaranth-antibiotics. Treatment of amaranth was 200mg/kg/day body weight in Study I, and 400mg/kg/day in Study II, given by stomach tube (gavage). Antibiotics used in Study I were: polymyxin B sulfate, 2mg/100g/day gavage and 120mg/liter water; neomycin sulfate, 10mg/100g/day gavage and 3.0g/liter water. Study II antibiotics were given in a ground Purina lab chow mixture, in place of gavage.

Polymyxin B sulfate and neomycin sulfate dosages were halved, and a third antibiotic (bacitracin) was added in dosages of 500units/100g/day feed and 30,000 units/liter water. Study I and Study II treatments and observations continued until day 20, at which time animals were sacrificed, abdomen opened, uterine horns exposed, and a count of fetal swellings, placement, and resorptions made. The uterus was then opened to determine viability, weight, length, sex, and any malformations of fetuses.

Study I resulted in amaranth and amaranth-antibiotic groups having greater numbers of fetuses and heavier fetuses than other groups in this study. Study II resulted in the amaranth group having fewer but heavier fetuses, and the amaranth-antibiotic group having fewer but lighter fetuses. The antibiotic group also had lighter fetuses than the control group.

In neither study was there late death or visibly malformed fetuses. The antibiotic group of Study I was the only group with significant numbers of resorptions.

UPTAKE OF #65 ZN BY THE FUNGI ACHYLA AND SAPROLEGNIA. William Edinger and John Clausz, Department of Biology, State University College College, Geneseo, New York, 14454.

The filamentous fresh-water fungi Achlya sp. and Saprolegnia sp. showed the ability to accumulate significant amounts of the radionuclide ^{65}Zn when grown in PYG broth culture. Measurement was performed with a NaI(Tl) crystal on the freeze-dried mycelium and its culture broth. The species were also examined for the ability to retain the nuclide after being placed in an untreated culture medium, and showed between 80 and 100% retention. Killed mycelia were tested for passive absorption of ^{65}Zn and showed significant accumulation, though considerably less than the living fungus. Achlya was shown to be more active than Saprolegnia.

EFFECT OF HYPOTHYROIDISM ON THE UTERINE RESPONSE TO ESTRADIOL IN THE RAT. R. M. Gardner, J. L. Kirkland, J. S. Ireland and G. M. Stancel. Rochester Institute of Technology and The University of Texas Medical School, Houston, Texas.

The uterine response to estradiol (E_2) was studied in ovariectomized euthyroid and hypothyroid rats. The hypothyroid state significantly reduced E_2 stimulated uterine growth as compared to euthyroid rats. Hypothyroidism did not alter the time course or the uterine sensitivity to E_2 as demonstrated by dose-response and time-course studies of E_2 effects. Uterine growth responses were replaced in hypothyroid rats treated with 3, 3^1, 5^1 - triiodothyronine. (Supported by NIH grant Hd 08615).

BrDU (5-BROMODEOXYURIDINE) INCORPORATION IN MOUSE DNA (DEOXY-RIBONUCLEIC ACID). D. Hochhauser-Campillo, C. Brennan, Dr. Marlene B. Appley, Department of Biological Sciences, State University College, Brockport, New York.

Mouse melanoma cells $B_5 59$ cloned from a spontaneous tumor, obtained from Dr. Selma Silagi of Cornell Medical School, were allowed to replicate for two and three generations in the presence of 3 ug/ml of 5-bromodeoxyuridine (BrDU). G-banding was used to identify chromosomes. Antibody labeling using the Peroxidase-Anti-Peroxidase (PAP) method with serum specific for the thymidine analog was used to localize the incorporated BrDU. The incorporation pattern as expressed by regional staining may or may not correspond with the regions of G-bands. C-banding was also used to identify areas of highly repetitive (satellite) DNA.

Another cell line $C_3 471$, cloned from $B_5 59$, has been maintained on long-term incorporation of BrDU at a concentration of 1 ug/ml. Cell line $C_3 471$ is now amelanotic and non-tumorigenic as a result of the dedifferentiation of cell-regulated functions which occurs when BrDU is substituted for thymidine. The areas of high BrDU concentration of the $C_3 471$ cells were also labeled by the PAP method.

Biochemical data show the BrDU is preferentially incorporated into the repetitive DNA when administered in non-toxic doses. G-banded metaphase chromosomes were destained and then PAP labeled. Chromosomes of both clones may reveal a correlation between G- and C-band positive areas with regions of high BrDU incorporation.

In conclusion, preferential incorporation of BrDU was shown by regional heavy labeling. In many chromosomes there was correspondence of these regions with heterochromatic regions including areas of constitutive (c-band positive) heterochromatin. These regions may have regulatory functions.

EVIDENCE FOR CHROMOSOME ENDOREDUPLICATION IN THE GREEN ALGA, DUNALIELLA TERTIOLECTA, A.H. Latorella, D. Eustice, and P. Regan, Biology Department, State University College at Geneseo, Geneseo, New York, 14454.

The green alga, Dunaliella tertiolecta, has achieved a generation time of as little as 4.7 hours in actively dividing (log-phase) cultures. However, when cultures reach densities of approximately 10 x 10^6 cells/ml, division abruptly ceases. Dilution of non-dividing (stationary phase) cultures with fresh medium results in a 14 hour lag period and then resumption of the 4.7 hour generation time of log-phase cultures.

During the lag period, the cells synthesize DNA to the extent that the level of DNA at the resumption of log-phase is 4 times as great as that of stationary phase cells. As the cultures approach stationary-phase, the DNA level is gradually decreased.

Pulse-labeling experiments indicate that late log-phase cells may undergo 2 divisions without DNA replication. There is no evidence through electron photomicrography for a difference between log-phase and stationary phase in chromosome ploidy. DNA base ration analysis indicates that the different DNA levels are not due to the presence of more G-C rich satellite DNA in log-phase cells. A comparison of DNA renaturation kinetics reveals that log-phase cells contain only slightly more redundant DNA sequences than do stationary phase-cells, not enough to account for the differences in total DNA content.

Because of the exclusion of polyploidy, excessive satellite DNA and a high level of redundancy as sources of the increased DNA of log-phase cells and because of the demonstration of 2 cell divisions without DNA replication, it is concluded that D. tertiolecta during rapid division, synthesizes DNA at a rate independent of chromosome duplication and cell division.

RESPIRATION DURING LOCOMOTION IN LAND CRABS, CARDISOMA GUANHUMI.

Lawrence Lee and C. F. Harreid II, Department of Biological Sciences, State University of New York at Buffalo, 14260.

Crabs were outfitted with a respiratory mask and run on a treadmill at various speeds. Composition of inhalent and exhalent gases were determined by the use of the Scholander 0.5 cc gas analyzer. Ventilation of the gill chamber could be measured by collecting expired gas in balloons. Thus it was possible to determine O_2 consumption, CO_2 production, ventilation volume and oxygen extraction during exercise and rest. At the speed of locomotion, 300 cm/min., O_2 consumption increased more than three times the resting rate; this was primarily compensated by an increase in the ventilation along with a modest increase in extraction efficiency. Recovery after 10 min. exercise was prolonged, lasting about 60 minutes with a pronounced O_2 debt, reflecting the importance of anaerobic processes in exercise in this species. The highest speed also produced a significant reduction in heart rate, an unexpected result.

CYTOCHEMICAL TESTS OF DIGESTIVE ENZYME (ACID PHOSPHATASE) SECRETION BY CARNIVOROUS PLANTS. R. E. Stauffer, F.R.A.S.

Methods of locating sources of phosphatase enzyme activity in animal tissue by use of a phosphate ester substrate which yields an azo dye precursor, and a suitable diazonium salt coupler have been extended by Y. Heslop-Harrison to the carnivorous plant genus, Pinguicula (butterwort), and have established in this genus as well as Drosera (sundew) and Dionaea (Venus Flytrap) the localized gland sources of such hydrolase enzymes as acid phosphatase.

The present paper describes the application of a modification of Heslop-Harrison's technique to carnivorous plant members of the genera, Utricularia (bladderwort) 3 species, and Sarracenia (North American pitcherplant) 1 species.

The substrate used was Naphthol AS-BI phosphate* and the preferred coupler salt was Azoene Fast Red PDC* (TM) which produced an insoluble red dye localized in active secretory glands of the plants studied. This combination of phosphate dye precursor substrate and diazonium coupler salt proved to have handling advantages in the form of reasonably stable working reagents and produced specific high resolution staining of the acid phosphatase secreting glands in all four species studied. Specific localized staining began within 20 - 30 minutes of application of the reagents and continued to develop intensity of staining over 24 to 36 hours. In Utricularia localized staining occurred in sessile glands on the outside of the trap walls and along the stem in the aquatic species U. vulgaris var. macrorhiza and U. minor as well as in the wet peat or sand dwelling species U. cornuta. Heavy staining also developed around the door. If traps were triggered to ingest the reagents localized staining developed in the quadrafid and bifids inside the traps. Generalized dye production took place in and on mature traps probably as the result of bacteria or other microorganisms present on or in the traps. *Naphthol AS-BI phosphate, Eastman Kodak Organic Chemical No. 11792. Azoene Fast Red PDC (TM), Eastman Kodak Organic Chemical No. 11073.

In the case of Sarracenia purpurea var. gibbosa sessile glands located both on the outside surface and inside the pitcher showed strong local staining. These glands are associated both with nectar production and enzyme secretion. In addition pronounced staining of cells in Macfarlane's "detentive surface" or Lloyd's "adsorptive zone" was demonstrated.

Concurrent Session No. 2 - Geology
Elizabeth Pixley, presiding

MIDDLE ORDOVICIAN CONODONTS FROM MARYLAND AND WEST VIRGINIA. J.L. Boger, Geneseo, New York 14454

Conodont-elements of the formations in the Beekmantown and St. Paul Groups in Maryland and W. Virginia have been isolated and used biostratigraphically. They show that the upper part of the Beekmantown is largely Whiterockian, not Early Ordovician as was previously thought, and they also indicate that the St. Paul Group is Chazyan in age. No evidence for an unconformity between the Lower and Middle Ordovician was found in the sequence studied, and it can be tentatively concluded that the Ordovician seas did not completely retreat from the study area until possibly the end of Chazyan time. The apparently continuous succession of Whiterockian and Chazyan strata in the study area suggests that this is the most complete Middle Ordovician sequence so far known anywhere in eastern and central United States.

MIXING MODELS APPLIED TO SEDIMENT IN THE RED SEA: GEOLOGIC IMPLICATIONS. Phillip D. Boger, Department of Geological Sciences, State University College of Arts and Science, Geneseo, New York 14454.

A new geochemical technique has been used to show that sediment from the Red Sea consists of a mixture of detritus derived from two chemically distinct sources. The appropriate mixing equations were used to determine the fraction of detritus derived from each source, and this information was used to determine the history of sedimentation in the Red Sea during the past 90,000 years. This technique can also be applied to other geologic problems such as contaminated magmas and the mixing of water masses with contrasting chemical compositions.

THE INFLUENCE OF LOCAL GEOLOGY ON BLUFF EROSION OF THE SOUTHERN COASTLINE OF LAKE ONTARIO. Sandra F. Brennan, Geology Department, State University of New York at Buffalo, New York.

Recent high lake levels and the lack of wide protective beaches have resulted in accelerated erosion of coastal bluffs along the southern coastline of Lake Ontario from the Niagara River to Oswego, New York.

The coastal bluffs consist of glacial till and glaciolacustrine sediments, with infrequent occurrences of bedrock at the base, and constitute approximately 85% of the length of the coastline. Analysis of rates of recession and changes in bluff profiles, measured over an eighteen month period, suggests that the most important factors which influence the retreat of the bluffs are: presence or absence of bedrock, and the lithology, mechanical properties, and sequence of the glaciolacustrine sediments which comprise the bluffs. Rates of recession measured during the eighteen month study period are not in close agreement with rates measured over longer time intervals. This lack of agreement is due, in part, to the fact that bluff recession takes place by the occurrence of discreet, large-scale events, such as slumps, slides, and mudflows, rather than degradation at a uniform rate.

MAGNETIC CORRELATION OF PLEISTOCENE TILLS ALONG THE SOUTHERN SHORELINE OF LAKE ONTARIO. W.J. Brennan, Department of Geological Sciences, State University College, Geneseo, New York 14454.

Analysis of clay-rich glacial tills and bedded lacustrine clays, which are interstratified with the glacial tills, has revealed that both materials carry a stable remanent magnetism. This remanent magnetism represents a record of the direction of the Earth's magnetic field at the time and place of deposition of each unit of till or lacustrine clay. Since the direction of the magnetic field at any geographic location varies with time, the deposition of a sequence of till and clay units results in the acquisition by each unit of a remanent magnetism which is different in direction from that of the other units. Thus each acquires a unique signature that can be used to correlate it from one locality to another. The magnetic characterization and correlation of till and clay units is independent of other methods based on textural and compositional properties, which are known to vary as the lithology of the local bedrock.

Preliminary results indicate that this method will allow correlation to be made not only along the shore of Lake Ontario where glacial tills and clays are relatively well exposed, but also in the southern tier of New York State where exposures of such materials are more scattered and often fragmentary.

The resultant accumulation of additional data on the secular variation of the Earth's magnetic field in the eastern Great Lakes region may ultimately make possible the identification of major time breaks in sequences of glacial tills and lacustrine clays.

MOSS ISLAND ENVIRONMENTAL IMPACT STATE - A PERSONAL VIEWPOINT. Richard D. Hamell, Department of Geosciences, Monroe Community College, Rochester, New York.

The objective of this report is to review and analyze the various proposed arterial extensions that would provide a direct route from the New York State Thruway Interchange 29A to the City of Little Falls. Currently, only three of the original five alternatives are being considered by the State Department of Transportation. Alternatives under consideration are 1, 3, and 4. All of these projects would have the same alignment from the Thruway Interchange 29A northward on Route 169 to the vicinity of Fink's Basin; a distance of approximately three-quarters of a mile.

Alternative 4 would cross the Mohawk River northward from Fink's Basin and intersect Route 5 one and three-quarters of a mile east of Little Falls and three-quarters of a mile north of Fink's Basin. Alternatives 1 and 3 would proceed westward from Fink's Basin for one and a half miles along the south side of the Mohawk River to a position about 1000 feet southeast of Moss Island. From here Alternative 1 would cross northwestward over the northeastern section of Moss Island and would connect with Route 5 near the present intersection of Hancock and East Main streets at the east end of the City of Little Falls. Supports for the spans would require the burial of the remaining Lock 36 of the Enlarged Erie Canal on the South side of the Mohawk River, the destruction of some of the geologic features (potholes), and pose a possible threat to the equilibrium of the present ecosystem on Moss Island.

Alternative 3 would cross the Mohawk River in a more northerly direction than Alternative 1, passing 200 feet east of Moss Island. In so doing, it would avoid the areas of contention between State Officials and environmentalists; and would intersect Route 5 one thousand feet east of the proposed terminus of Alternative 1.

In terms of cost and accessability from the New York State Thruway to the City of Little Falls, Alternative 4 would be the least expensive ($4.5 million), but the least accessable (3.0 minutes driving time). Second in cost would be Alternative 1 ($6 0 million) and would be the shortest in terms of driving time (2 minutes, 20 seconds); while Alternative 3 would be the most expensive ($7.1 million). However, this route would add no significant amount of driving time (2 minutes, 36 seconds) to the City of Little Falls.

In opposition to the State's favored proposal (Alternative 1), it is the recommendation of this report that Alternative 3 be implemented. The additional cost of 1.1 million dollars and the added 16 seconds is justified when balanced against the irreparable damage that will result to the historical and geological features, as well as the threat to the balanced ecosystem on and adjacent to Moss Island.

EVIDENCE OF LARGE SCALE MOTIONS OF THE EARTH'S CRUST RECORDED IN ANCIENT ROCKS. R. B. Hatheway, Department of Geological Sciences, State University College, Geneseo, New York

Ample evidence suggests that the Earth is not a stable body in a structural sense, that various portions of it are moving relative to one another and have done so in the geologic past. When such movement occurs, it is referred to by geologists as a fault, which is simply a break in the Earth's crust along which there has been movement. One example of an active fault system is the San Andreas, along the southern and central California coast. Differential crustal movement in this area has resulted in striking topographic features which allows one to readily determine the precise location of the fault.

When studying ancient rocks, however, one is forced to rely on evidence other than topographic expression in order to determine the extent of former crustal motion. Fortunately, the rocks themselves serve as recorders of evidence of the severe pressures they have been subjected to during their formative stages. The development of mylonitic rocks is particularly noteworthy in this respect. These are metamorphic rocks that are a result of severe crushing, such that the parent material has been sheared and perhaps even totally granulated, producing fine grained, very dense veins that appear similar to basalt, referred to as ultramylonites.

Presence of these ultramylonites in rocks some 350 million years old along the New England Coast is one line of evidence that suggests this area must have been subjected to crustal movement in the geologic past similar to that which the California coast is now experiencing.

A NEWLY-DISCOVERED SPECIMEN OF A HYDROID-LIKE FORM FROM THE UPPER WINDOM SHALE (MIDDLE DEVONIAN).
Daniel B. Sass, Geology Department, Alfred University, Alfred, New York, 14802.

This specimen is described, illustrated, and discussed. In the past, similar forms have generally been assigned to the genus Plumalina Hall 1858. The morphological characteristics of the specimen are somewhat more detailed than material heretofore described. Electron microscope studies of a living form of the genus Aglaophenia Lamouroux collected in the Galapagos Islands by Dr. John Wells of Cornell University, permit comparisons which indicate that the specimen may represent a new genus and a new species.

HOLOCENE CLIMATIC FLUCTUATIONS AS INDICATED BY PEAT BOG DEPOSITS IN LIVINGSTON COUNTY, NEW YORK.
L.P. Smith and R.A. Young, Department of Geological Sciences, State University College of Arts and Science, Geneseo, New York 14454.

Preliminary analyses suggest correlation between variations within bog deposits in New York State and established regional climatic fluctuations during the Holocene. The bog under study is located in a former glacial outwash channel, the base of which is filled with sands and gravels. These glacial outwash deposits are overlain by blue-gray lacustrine clay. The bog deposits are composed of alternating peat and marl units with a maximum thickness of 11 feet. Marl is assumed to have been deposited during wetter periods (higher water table); whereas peat probably accumulated during periods in which the water table was lower, but not low enough to permit forest growth.

This bog was investigated by Terlecky (University of Rochester, Ph.D. Thesis), who estimated ages for the deposits using assumed sedimentation rates. He interpreted the lower of two marls as having been deposited between 7000 B.P. and 5000 B.P. and the upper marl unit between 3000 B.P. and 2000 B.P.

Regional paleoclimatic data indicate a general postglacial warming that persisted through 11,000 B.P., and marked the end of the Pleistocene epoch in New York State. The persistence of a reduced ice sheet has been documented by a minor readvance in northern Canada around 8500 B.P., corresponding to a cooler, wetter(?) period. This period was followed by a general warming which lasted through 7000 B.P.

A thermal maximum for the Holocene in western New York is indicated by pollen data as having occurred near 5000 B.P. Moisture estimates from sea level date for coastal regions indicate moist periods between 8500 B.P. and 7500 B.P. and again from 6000 B.P. to 5000 B.P. A dryer interval is indicated for western New York by the disappearance of Hemlock from the pollen record about 4300 B.P. Wood samples from the Genesee River floodplain near Geneseo suggest that this dry period could have persisted to 1300 B.P., followed by a change to moister conditions.

Preliminary data suggest a correlation between peat accumulation in local bogs and the relatively warm, dry period between 11,000 B.P. and 8500 B.P. Evidence also suggests a correlation between the lower marl unit and the moist period which occurred between 8500 B.P. and 7500 B.P. The upper marl unit may correspond to the moist period from 6000 B.P. to 5000 B.P., but data is not yet sufficient to substantiate this.

THE EFFECT OF LAND USE ON AMBIENT AIR TEMPERATURES IN GENESEO, N. Y. Thomas B. Walter, Geography Department, State University College, Geneseo, New York

Urban centers generally experience warmer temperatures than the surrounding rural countryside. This phenomenon known as an urban heat island has been studied in fairly large cities although it can occur in towns and cities of all sizes.

Geneseo, N.Y. is a small rural village with a population of 6,000 people including the college. Urban and suburban land use constitute less than one square mile in area. The village is surrounded by agricultural land and is situated on the east slope of the Genesee River Valley approximately 220 feet above the valley floodplain.

This study involved extensive monitoring of air temperature patterns to determine the specific role of land use and topography in influencing ambient air temperature variation.

The fine accuracy and spatial resolution of observed data necessary for this study mandated the use of mobile transects using a fast-response electronic thermistor.

Observations of these temperature patterns indicated the development of an urban heat island with a magnitude of 3-5°F under certain meteorologic conditions.

This study was completed under the direction of Dr. Ray Lougeay, Department of Geography, S.U.C. at Geneseo. Field observations and data collection were supported by the Geneseo Foundation. Facilities were provided by S.U.C. at Geneseo.

REVISING THE GEOLOGIC HISTORY OF THE GRAND CANYON: A STUDY OF REGIONAL DRAINAGE REVERSAL. R.A. Young, Department of Geological Sciences, State University College, Geneseo, New York 14454.

Detailed studies of Cenozoic rocks in northwestern Arizona have provided new evidence concerning the origin and age of the Grand Canyon of the Colorado River. Radiometric age determinations on volcanic rocks of Miocene to Oligocene age (5 to 24 m.y.) have allowed correlation of geologic events over broad regions where it had previously been impossible to piece together the exact sequence of events that produced the modern drainage system.

It has been established that the regional drainage system that carved the basic physiography of the plateau in northern Arizona was related to a broad "uplift" in western and south-central Arizona occurring in early Cenozoic time, most probably beginning during the Laramide Orogeny at the close of the Cretaceous. This regional drainage flowed northward into southwestern Utah until Oligocene time and created most of the basic physiographic elements prominent in the modern landscape. The Colorado River developed much later after the major episode of basin and range faulting of Miocene age (5-23 m.y. ago).

Previous studies had not established an age greater than Middle Miocene (17 m.y.) for the north-flowing, pre-Colorado River drainage that covered the edge of the Colorado Plateau with thick gravel deposits derived from crystalline rock terranes adjacent to the plateau.

Other studies incorporating modern concepts of plate tectonics in the southwestern U.S. provide a consistent model of regional events, including Early to Middle Cenozoic thrust faulting, in Central Arizona and the opening of the Gulf of California only 3 to 6 million years ago (the mouth of the Colorado River).

commersonnii) and johnny darters predominating. June was typified by peak larvae densities (70.9/1000m^3), and the greatest diversity of species, dominated by johnny darters. Densities decreased in July and August (<2/1000m^3); cyprinids were the main group taken. Nighttime larvae densities were generally higher than daytime, however the differences were not found to be statistically significant.

A WINTER FISH SURVEY OF THERMALLY ENRICHED WATERS IN SLATER CREEK, ROCHESTER, NEW YORK. Kathleen L. Hadley, Samuel J. Markello, Wayne F. Hadley*, and Rostyslaw Caryk, Bio Systems Research, Inc., Buffalo, New York, and*State University of New York at Buffalo, Buffalo, New York.

Electrofishing and seining studies were conducted in an enlarged portion of Slater Creek, immediately preceding its entry into Lake Ontario, on each of two dates (January 13 and March 10) during the winter of 1977. Most of the study area consisted of heated discharge water from a nearby electric generating station. Water temperatures within the area sampled on January 13 and March 10 were within a range of 14.8-15.0°C and 12.4-14.2°C, respectively; this reflects an approximate increase of 13-12°C above ambient lake temperatures (lake water being the primary source of cooling water).

The primary objective was to monitor and develop a data base on species composition and relative abundance of fish inhabiting sheltered heated waters within a portion of Slater Creek frequented by urban fishermen. The survey is unique because most thermally enriched waters discharged into Lake Ontario are not readily accessible for sampling during winter months.

In general, the fish population displayed few differences between surveys and was dominated by rough and forage species, while typical sports fish were represented by very few individuals. The three dominant species taken by boat-shocking were (1) gizzard shad (Dorosoma cepedianum) >100/study, (2) goldfish (Carassius auratus) >50/study, and (3) carp (Cyprinus carpio) >20/study. Mean lengths and weights of representatives from these three species were significantly greater ($p \leq .05$) in March than in January. Condition factors were not significantly different between studies.

A variety of sports fish were captured in low numbers (<3/study) by boat-shocking; they included rainbow trout (Salmo gairdneri), brown trout (Salmo trutta), coho salmon (Oncorhynchus kisutch), largemouth bass (Micropterus salmoides), and northern pike (Esox lucius).

Additional species taken in low numbers (<6/study) included bowfin (Amia calva), white sucker (Catostomus commersonnii), redhorse sucker (Moxostoma sp.), common shiner (Notropis cornutus), and brown bullhead (Ictalurus nebulosus).

Supplemental sampling along the shoreline with a back-pack shocker and seines yielded some specimens of mottled sculpin (Cottus bairdi), fathead minnow (Pimephales promelas), bluntnose minnow (Pimephales notatus), johnny darter (Etheostoma nigrum), pumpkinseed (Lepomis gibbosus), golden shiner (Notemigonus crysoleucas), rock bass (Ambloplites rupestris) and emerald shiner (Notropis atherinoides).

PREY SELECTION BY WINTERING GRAY SQUIRRELS. Allen R. Lewis, Department of Biology, University of Rochester, Rochester, New York.

The consumption of tree seeds by wintering gray squirrels was studied to test a prediction of food preference arising from published models of prey selection. In late fall the number of seeds in the leaf litter and the top layer of soil on a 4.5H study site was estimated by counting seeds in a stratified random sample of 657 units totaling 1/200 of the area of the study site. The estimates with percent standard error were as follows: hickory nuts, 600(33); red oak acorns, 30,600(11); chestnut oak acorns, 154,800(11); and white oak acorns, 117,200(10). Patterns of consumption in time and space for the four species of seeds were observed by recording the species and location of each seed dug from beneath the snow and consumed on the surface by squirrels. The collections were made on forty days spread throughout the period of snow cover and revealed a total consumption of 58 hickory nuts (H), 1160 red oak acorns (R), 2946 chestnut oak acorns (C), and 383 white oak acorns (W). When the numbers consumed were considered in relation to the numbers available, a significant preference ranking emerged: H>R>C>W. The prey selection models

predicted seed preferences would be ordered according to the net rate of intake of Calories experienced by an animal while opening and consuming a particular kind of seed. This ranking was estimated from calormetric analysis and seed weight distributions of seeds from the study area and published estimates of feeding rates. The expected ranking was R>C>W>H. The preference for hickory nuts, despite their apparently low rate of return due to small size and long handling time, caused the observed ranking to deviate from this expectancy. Factors other than the rate of intake of crude Calories must contribute to the preference for hickory. Hickory nuts contain more proteins and fats and have more Calories per gram than acorns. Their greater Caloric density and nutritional superiority may, over the course of a winter, yield a fitness advantage that compensates for the lowered average rate of intake of Calories experienced by a squirrel that consumes them. The preference ranking for acorns alonematched the expectation of the models. Acorns are relatively uniform in composition, and, perhaps as a result, rate of intake of Calories is a good predictor of acorn preference.

THE FEEDING OF FISH AROUND A POWER PLANT THERMAL DISCHARGE. W. S. Lifton and J. F. Storr, Biology Division, State University of New York at Buffalo, Amherst Campus, Amherst, New York, 14260.

For more than seven years environmental studies have been carried out around Rochester Gas and Electric's R. E. Ginna Nuclear Power Plant. Fish populations were studied by means of experimental gill nets. Macroscopic examination of fish stomach contents were carried out in the field.

Fish species studied in particularly large numbers included white perch, smallmouth bass, rock bass, and brown trout. Each species was found to have preferred food(s) with some seasonal changes in the foods eaten corresponding with seasonal availability of benthic organisms.

Comparisons were made between foods eaten by fish at areas affected by the plant's thermal outflow and control stations. No statistically significant differences were found.

SOME FISHES OF THE GENESEE RIVER BETWEEN UPPER AND MIDDLE FALLS, ROCHESTER, NEW YORK. Samuel J. Markello and Brian Currie, Bio Systems Research, Inc., Buffalo, New York.

Fish surveys were conducted during June 11-15, August 24-28, and October 20-21, 1976 within the turbid Genesee River waters between Upper and Middle Falls in Rochester, New York. The primary objective was to establish a data base on fish species inhabiting a unique, isolated region heretofore not sampled. Data relative to species abundance, lengths, weights, and condition factors were recorded. Most large fish (total 133) were tagged and returned to the River.

The study area is bounded by two water falls (Upper and Middle Falls, both in excess of 27m), and the river is impounded by a headgate dam at Middle Falls. Water level and flow rates may vary quickly due to storm runoff and/or hydroelectric demands. Three ecologically diverse sites were selected for sampling with experimental gill nets, Connecticut style trap nets, minnow traps, seines, and trot lines sites were termed "Discharge", "Midstation", and "Headgate". "Discharge" exists in a scoured, narrow (50m), shallow (2m), swift flowing region about 350m downstream from Upper Falls, and receives a thermal discharge from an electric generating station. "Midstation" exists roughly 1200m downstream from Upper Falls in a wider (70m), deeper (6m), mud-bottomed area, adjacent to a marsh habitat. "Headgate" exists within sluggish impounded waters (depth-6m) at Middle Falls, and reflects a pond-like environment inundated by a marsh.

Nineteen species of fish were taken over 12 days of sampling effort in 1976. Thirteen of the species collected were previously reported in the literature as occurring in waters above Upper Falls; they include the brown bullhead (Ictalurus nebulosus), carp (Cyprinus carpio), emerald shiner (Notropis atherinoides), golden shiner (Notemigonus crysoleucas), johnny darter (Etheostoma nigrum), log perch (Percina caprodes), northern hog sucker (Hypentelium nigricans), northern pike (Esox lucius), redhorse sucker (Moxostoma sp.), rock bass (Ambloplites rupestris), stonecat (Noturus flavus), white sucker (Catostomus commersoni), and yellow perch (Perca flavescens). The six remaining species, consisting of the alewife (Alosa pseudoharengus), black crappie (Pomoxis

nigromaculatus), channel catfish (Ictalurus punctatus), freshwater drum (Aplodinotus grunniens), quillback (Carpiodes cyprinus), and white bass (Morone chrysops), have not been previously reported as inhabiting upstream waters.

Five species are regarded as major fish within the study area, based on their relatively high average catch/unit effort (ACUE) and their repeated presence in each study period. They are (1)emerald shiner - common (>100/seine haul), (2) rock bass - ACUE of 0.9 and 0.1 for trap (T) and gill (G) nets, respectively, (3) channel catfish - ACUE 0.4 (T), none taken in gill nets, (4) redhorse sucker - ACUE 1.7 (T) and 2.4 (G), and (5) white sucker - ACUE 0.5 (T) and 0.7 (G).

Seasonally, catches averaged over all stations were greatest in August - ACUE 7.4 (T) and 8.2 (G) with water temperatures ranging 23.5-25.5°C among stations, followed by June - ACUE 4.2 (T) and 1.0 (G) with temperatures of 18.9-30°C, and lastly October - ACUE 1.7 (T) and 2.7 (G) with temperatures of 8-11°C. Spatially, more species were present and catches were usually greater in the deep, slow moving, marsh inundated waters of the Headgate and Midstation, than in the swift, shallow, vegetation-free waters of the Discharge region.

MIGRATION OF ALEWIFE (ALOSA PSEUDOHARENGUS), RAINBOW SMELT (OSMERUS MORDAX), AND GIZZARD SHAD (DOROSOMA CEPEDIANUM) IN THE GENESEE RIVER. Paul M. Sawyko, Rochester Gas and Electric Corporation, Rochester, New York.

During the period April - December, 1976, impingement studies were conducted at RG&E's Beebee Station located on the Genesee River near downtown Rochester. Such studies can assist in understanding the fish community in the River when impingement is viewed as a sampling technique. Impingement during this period indicated the presence of alewife (Alosa pseudoharengus), rainbow smelt (Osmerus mordax), and gizzard shad (Dorosoma cepedianum) principally during the months of October and November. The general absence of these species in other concurrent river sampling, the overall absence of adults of these species, and the relatively short time span of occurrence all support a downstream migration theory for these three species. Since upstream migration would by physically blocked by the Lower, Middle and Upper Falls, an upstream spawning location must be assumed.

Based on the Beebee collections, an estimated 830,000 juvenile alewife, 60,000 smelt (primarily juveniles), and 54,000 juvenile gizzard shad migrated down the Genesee River during the months of October and November, 1976. The implication of such a migration is an annual recruitment of these species to Lake Ontario populations.

Concurrent Session No. 4 - Parasitology
Gustav Garay, presiding

ULTRASTRUCTURE STUDY OF Chilomonas paramecium Ehrenberg. Jerry Calvin and Edward Ritter, Department of Biology, State University College, Geneseo, New York, 14454.

The ultrastructure of the biflagellate cryptomonad Chilomonas paramecium is presented.

The organism, cultured from water obtained from the Rochester reservoir, demonstrates the general characteristics of a eukaryotic cell: mitochondria, Golgi, ribosomes, nucleus with nucleolus, etc. The mitochondria, however, are highly branched and exhibit a definite orientation in the area of the ejectosomes. The four categories of ejectosomes and their distribution in the cell are noted. Particular reference is made to the structure of this organelle in the different areas of the cell and their possible mode of release from the cell. The striated border mentioned by Anderson (1962) could not be demonstrated in the area of the contractile vacuole, nor could any structure be demonstrated that would correspond to the amphosome, depicted by light microscopists. Sepsenwol's (1973) description of the leucoplast and starch configuration in this form is re-affirmed.

CULEX SP. LARVAL PREDATION STUDIES WITH CHLOROHYDRA VIRIDISSIMA AND STENOSTOMUM SP. Craig W. Curtis, Niagara University, New York.

European green hydra, Chlorohydra viridissima (Carolina, May 1977) were tested for differential larval instar predation rates on Culex sp. mosquitoes. To determine the destructive capacity of C. viridissima for various instar mosquito larvae and pupae, tests were conducted in 4½" specimen dishes (Carolina). Levels of 60.4%, 75.2%, 72.8%, and 61.8% mortality due to C. viridissima predation were observed in first, second, third, and fourth instars, respectively. 100% survival was observed with pupae. It

was shown that predation rates by C. viridissima on second and third instar Culex sp. mosquito larvae were significantly greater than the predation rates observed on first and fourth instars. Larval instar size ranges were: .96 - 1.44mm, 1.8 - 2.64mm, 2.91 - 4.5mm, and 3.4 - 6.0mm with average sizes of 1.2mm, 2.28mm, 3.49mm, 4.5mm for first, second, third, and fourth instars, respectively.

A turbellarian, Stenostomium sp. was also tested for predation on Culex sp. larvae. No predation was observed. A lack of an effective predation mechanism and relative small size were important factors.

Supported by NSF Grant # SMI-77-06009.

PREVALENCE OF HUMAN INTESTINAL PARASITES IN CAPARROSO, TABASCO, MEXICO. Kevin Sorge and John Kowalski, Department of Biological Sciences, State University College, Brockport, New York, 14420.

A survey of human intestinal parasitism was conducted at Caparroso, Tabasco, Mexico. The area is tropical, rural, and semi-mountainous. The inhabitants of this area live in thatched roofed, pole dwellings with dirt floors, 1 to 3 kilometers apart from one another. The primary means of support is agriculture, based on 3 crops, rice, beans, and corn, of which corn is the most important. Malnutrition is common, caused both by primitive farming methods and the lack of a balanced diet.

The people brought their fecal samples to a small field clinic. These samples were then transferred to vials containing PVA (polyvinyl alcohol) fixative. Wet mounts of the fixed material were prepared in the field and examined with a light microscope for the presence of protozoa and helminths. This initial examination showed that over 75% of the people were infected with one or more intestinal parasites. Ascaris, hookworm, Trichuris, and protozoan cysts were most commonly seen.

The fixed fecal samples were brought back to Brockport. The samples were concentrated by the acid-ether sedimentation technique. Permanent slides were prepared and stained with trichrome stain. Further examinations and classifications were then performed. Based on this examination, recommendations for treatment and preventive control were made to the people of Caparroso.

THE LIFE CYCLE OF GLYCYPHAGUS (MYACARUS) SPECIES NEAR ABNORMIS (ACARI: GLYCYPHAGIDAE). Edwin J. Spicka, Biology Department, State University College, Geneseo, New York, 14454.

Adult glycyphagid mites, Glycyphagus (Myacarus) species near abnormis, were removed from a nest of the pine vole, Microtus pinetorum, from Ulster County, New York, and were cultured in rearing chambers. All stages (larvae, protodento-, tritonymphs, males and females) were preserved, cleaned, stained, mounted on microscope slides and described with the aid of a camera lucida attached to a phase contrast microscope. The findings of this study indicate that G.(M.) sp. near abnormis is a free-living nest form similar to G.(M.) abnormis Volgin, 1961, and G.(M.) hypudaei (Koch, 1841) and should be described as a new species in accordance with the International Code of Zoological Nomenclature. Glycyphagus (M.) sp. near abnormis possesses a phoretic hair-clasping deutonymph (hypopus) and two tritonymphal forms. It is capable of skipping the deutonymphal stage and developed from egg to deutonymph in 13 days.

This research comprises, in part, a Ph.D. dissertation (Indiana State University, Terre Haute, Indiana, 1977).

AN ELECTRON MICROSCOPE STUDY OF THE DISTRIBUTION AND STRUCTURE OF CORALLOTAENIA MINUTIA (CESTODA) MICROTRICHES. Clinton Tallman and Edward Ritter, Genesee Community College, Batavia, New York, and State University College, Geneseo, New York, 14454.

The tegument of the cestode Corallotaenia minutia has microtriches distributed over the entire surface. The length and diameter of these structures vary on the scolex and proglottids. Electron microscopy revealed that the microtriches have microfilaments and a double membrane without gaps. The cylindrical shaped microtriches have electron opaque distal ends which are at a slight oblique angle. The medullary region is an extension of the distal cytoplasm. Exocytosis is exhibited between the individual microtriches.

SOME ENDOSYMBIONIC FAUNA ASSOCIATED WITH THE SNAIL, VIVIPARUS GEORGIANUS (LEA) FROM CONESUS LAKE, LIVINGSTON COUNTY, NEW YORK. Jean Q. Wade and Carey E. Vasey, Biology Dept., State University College, Geneseo, New York, 14454.

Viviparus georgianus (Lea) is the largest and most abundant snail encountered in Conesus Lake, Livingston Co., New York (Wade and Vasey, 1976, Proc. Roch. Acad. Sci., In Press).* In 1971, Mr. Kuang-fu Tang, a biology graduate student at Geneseo, isolated an unencysted metacercaria from the oviducts of this snail. Fischthal (1974) has since described this as a new species, Amblosoma pojmanski (Trematoda). The definitive host for this parasite is still unknown.

During the six-month period between September 1976 and March 1977, a total of 81 specimens of V. georgianus were dissected in order to determine the extent to which this species served as intermediate host to other trematode parasites. Studies revealed that sporocyst infections of the hepatopancreatic gland and gonads were common. However, only xiphidiocercariae, a morphological type of cercarial stage peculiar to the Order Plagiorchida have been seen emerging from these same organs. During the course of our investigations, a number of other species of endosymbionts were discovered, none of which have been reported previously in this host.

In the gill leaflets and surrounding fluids, two kinds of ciliated protozoans have been found in substantial numbers. One of these has been tentatively identified as a Colpidium-type species, while the other has not yet been determined and is under investigation. Between 20-30 specimens of the annelid Chaetogaster spp. were removed from ten different snail specimens dissected. These symbionts were found either exterior to the mantle cavity, on the mantle surface, or on the gill surface. In four specimens of snails, worms were located within the gill itself. Two specimens of Viviparus georgianus were found to house a lone, red, midge larva (Insecta Diptera, Chironomidae). In both instances these larvae were observed crawling around in the mid-gut area.*(13[1]:17-21, 1976).

Concurrent Session No. 5 - Behavior; Physiology
W. J. Graham, presiding

EXPERIMENTAL INCREASE OF BROOD SIZE IN RED-WINGED BLACKBIRDS: A TEST OF LACK'S HYPOTHESIS. James R. Cronmiller, Department of Biology, State University College, Geneseo, New York, 14454.

David Lack hypothesized that the clutch size of alterical birds is adapted by natural selection to correspond to the largest number of young for which the parents can, on the average, provide enough food. I tested Lack's hypothesis by artifically manipulating the size of Red-winged Blackbird broods on a study area at the south end of Conesus Lake, Livingston County, New York in 1977. In this area Red-winged Blackbird brood size is usually 3 or 4 young; this was increased by placing two additional young in experimental nests on the day of hatching. As a control young were exchanged among nests without altering brood size. All nestlings of manipulated nests were the same age.

There were no differences between control and natural nests in survival of nestlings or in their weights. Natural broods produced 2.4 young per successful nest, where as manipulated broods produced 3.9 young per successful nest. Manipulated nests fledged more young per nest despite the fact that 20.5% starved. However, mean weights of nestlings in manipulated and natural broods differed at the end of the nestling period.

Although more young were produced in experimental nests, the results of the experiment are probably consistent with Lack's hypothesis because young from manipulated broods weighed less than young from natural broods. These lighter young probably suffer higher post nest leaving mortality than young from natural nests. Therefore, larger broods probably do not produce more potential breeders than broods of natural size.

EFFECTS OF LEVEL OF ACOUSTIC STIMULATION ON LOCOMOTOR ACTIVITY IN THE GERBIL (MERIONES UNGUICULATUS). Peter F. Galvani, Department of Psychology, State University College, Brockport, New York.

Two separate experiments were conducted to assess the effects of background acoustic stimulation on general (goalless) activity in the Mongolian gerbil. In Experiment 1 the presence of background white noise, relative to a condition of silence, was found to facilitate rate of locomotor activity in a shuttlebox apparatus. Also, both incremental and decremental shifts in noise intensity produced immediate increases and decreases, respectively, in activity level. The second experiment revealed that the relationship between shuttle-activity level and background noise intensity was nonmonotonic over the 60-90 dB range, with optimal facilitation manifested at 80dB. A similar trend was also observed employing a running-wheel activity device. Finally, in both experiments substantial habituation of general activity was observed. A significant theoretical implication of the results of these experiments is that potentially all environmental stimuli function as energizers (motivators) of behavior.

FERTILIZING ACTIVITY OF STORED SPERM IN THE FEMALE GUPPY, POECILIA RETICULATA PETERS (POECILIIDAE). K. Gruschow and B. Bowden, Alfred University, Alfred, New York

Female guppies store sperm within the ovary and once inseminated and isolated, will give birth to many broods of young during the next several months. What happens to stored sperm when a female becomes reinseminated, has not been thoroughly investigated. Employing a xanthic mutant 'blond' strain as a marker, matings, rematings, and backcrosses between 'blond' females and 'blond' and wild type males have been made. Results from rematings show initial precedence by the most recently introduced sperm, whether wild or 'blond' type. In a few instances, the original sperm reappeared in a subsequent brood. Progeny ratios from backcrosses do not support the report that wild type sperm has competitive superiority over 'blond' sperm in fertilization.

REPRODUCTIVE SUCCESS IN SIBLING VS. NON-SIBLING PAIRS OF PRAIRIE VOLES, MICROTUS OCHROGASTER. Valerie Haight, State University College, Oswego, New York.

Adult female prarie voles will readily come into estrus and mate when confronted with an unfamiliar male. Adult females residing with sibling males, however, will rarely mate. It has been suggested that immature females placed at weaning with like-aged non-sibling males might not mate, but will react as if the males were siblings. This study was initiated to see if reproductive success is affected by the age at which non-sibling pairs are established.

Sixteen control sibling paris and sixteen non-sibling pairs were established from 20 to 60 days of age. Dates of litters were recorded and days between pairing and littering determined.

After 135 days after birth, no sibling pairs had successfully mated; however, most of the non-sibling pairs mated within this time period. Among successfully mating non-sibling pairs, the younger the animals were at pairing, the longer the time interval from birth to successful littering.

No female younger than approximately 60 days of age successfully littered. However, non-sibling pairs established at only 20 to 26 days of age took considerably longer than 40 additional days to bring off their first litter. Therefore, the delay in mating involved more than achievement of a minimal age.

Thus, the age at which non-sibling pairs are established affects successful mating. Mating is not suppressed by the early establishment of non-sibling pairs, but it is certainly delayed.

ECCRITIC TEMPERATURES OF TWO SPECIES OF THAMNOPHIS ON THE ALLEGHENY HIGH PLATEAU. Mark M. Kozubowski, Department of Biology, St. Bonaventure University, St. Bonaventure, New York.

Cloacal, substrate, and air temperatures were collected, in the field, for the garter snakes Thamnophis brachystoma and T. s. sirtalis for the period April - October, 1976. Body temperatures for T. brachystoma ranged from 6.8°C to 34.6°C with a mean of 25.5°C (N=185). Body temperatures for T. s. sirtalis ranged from 7.0°C to 32.6°C with a mean of 23.0°C (N=103). Both species appeared to be thigmothermic rather than heliothermic, since basking was rarely observed.

THE EFFECT OF ODOR FROM DONOR MICE AND 0.2% CO_2 IN AIR ON THE METABOLISM OF RECIPIENT ANOSMIC MICE. Evelyn H. Schlenker and David Carlson, Department of Biology, State University of New York, Buffalo, New York.

A number of researchers have shown that odors from the urine and bodies of donor mice affect the growth, sexual maturation and activity of recipient mice. The present experiments compared the effect of air pumped from donor male albino mice on the metabolism of male recipient normal and anosmic mice.

Two groups of recipients were prepared - control and anosmic mice. The mice were made anosmic by Vandenberg's technique (1973) using nasal infusions of 0.9 ml of 5% $ZnSO_4$. The control group received infusions of normal saline. When both groups were exposed to donor air, their metabolic rates dropped about 30% as compared to baseline values. These results suggest that the causative agent was acting systemically rather than via the olfactory system.

To further test the latter hypothesis, both control and anosmic groups received 0.2% CO_2 in air vs. 0.05% CO_2 in air. A reduction of greater than 30% was noted only when both groups had been given 0.2% CO_2 in air. From these experiments, it appears that a small increase in ambient CO_2 levels can decrease metabolism of mice profoundly. The mechanism of action is not known.

SAPSUCKER TREES AS A FACTOR IN THE DISTRIBUTION OF HUMMINGBIRDS IN A NORTHERN CLIMATE. E. E. Southwick, Department of Biological Sciences, State University College, Brockport, New York, 14420.

Two consecutive years of field work on Ruby-throated Hummingbird ecology in northern Michigan gave evidence that nest sites are selected in close proximity to sapsucker trees. The hummingbirds were found to utilize as a food source the sap made available by sapsucker drillings. Because of the climate in this northernmost fringe of the hummingbirds' breeding range, flowers did not consistently blossom and produce nectar before the spring arrival of migrants. The early arrivals were forced to find other sources of food and depend on active sapsucker trees. The sap was also preferred by brooding females over nectar available in blossoming flowers throughout the nesting season. It is suggested that selection of nest sites, and thus hummingbird distribution, is closely associated with sapsucker feeding trees.

Concurrent Session No. 6 - Botany; Ecology
Elizabeth Pixley, presiding

BULBIL PRODUCTION SITES IN TISSUE OF CONOCEPHALUM CONICUM (L.) DUMORT. J. B. Barayasarra and A. F. Finocchio, SUNY Agricultural and Technical College, Alfred, New York, 14802, and St. Bonaventure University, St. Bonaventure, New York, 14778.

Field and laboratory studies of C. conicum indicate that bulbil formation is a regular means of asexual reproduction. Early workers indicate that bulbils occurred on midrib tissue on laboratory material. Very little occurs in the literature until Ainsworth in 1965 reported bulbils on thallus tissue as well as from the parenchymatous tissue between ventral and dorsal epidermis.

Comparative studies were made concerning bulbil production on pieces $1mm^2$ with and without midribs in both continuous light and in continuous darkness. The effects of various plant growth hormones were also tested in continuous light and in continuous darkness.

Most tissues were capable of bulbil formation under all conditions tested although lower epidermis of midrib tissue was the most common site. The earliest bulbils occured on epidermal cells of the midrib in both light and dark experiments. Bulbils grown under continuous light conditions favored the midrib site to a greater degree than those grown under continuous darkness for all hormones tested. Occasional bulbils did develop from parenchyma cells on the cut surfaces between upper and lower epidermal cells. Field bulbils found were all on the lower epidermis of midrib tissue.

FATTY ACIDS IN THE WATER MOLDS. John C. Clausz, Biology Department, State University College, Geneseo, New York 14454.

Single spore isolates of sterile strains of Achlya and Saprolegnia and a strain of Dictyuchus monosporus were grown in peptone-yeast extract-glucose medium. Lipids were extracted from freeze-dried mycelial mats and amount of lipid determined gravimetrically. About 0.05 milligrams lipid were extracted for each milligram of mycelial dry weight.

Extracts were saponified, methylated and analyzed by gas-liquid chromatography. Comparison of retention times of extracted fatty acids with reference standard retention times suggest the presence of Myristic (14:0), Palmitic (16:0), Stearic (18:0), Oleic (18:1), Linoleic (18:2), Linolenic (18:3), Arachidic (20:0), and two longer-chained or more saturated fatty acids, the identity of which is yet to be established. Palmitic and Oleic were the major fatty acids - accounting for 40-50 percent of all the fatty acids. At a given temperature, the age of culture over a 9 day interval does not change the relative abundance of the different fatty acids. Temperature, however, does affect the relative abundance of the different fatty acids.

PLANT PROTECTION IN NEW YORK. Herman S. Forest, Biology Department, State University College, Geneseo, New York.

Several species of showy wildflowers as well as all native ferns had been protected in New York for several years, but the law was lost in a codification which occurred in 1967. Protection was reinstated seven years later and Section 193.3 of part 9-1503 of the Environmental Conservation Law took effect September 1, 1974. The protection was minimal, since it provided protection against removal without a landowner's consent and a penalty of $25. In the summer of 1974, the Commissioner of Environmental Conservation appointed a committee to prepare a list of protected plants, including some botanists as well as garden club officials and active amateurs. After public hearings, the list was published in 1975. It included showy wildflowers, a few attractive shrubs, and seedless vascular plants. The choices were almost wholly unrelated to rarety or threat of extinction. Indeed, several, such as the trillium, can be found by the acre in parts of the state.

Only in the last few years has a more scientific approach been initiated. One of the major tasks undertaken by the new State Botanist, Richard S. Mitchell, has been to search records systematically and determine from all available evidence which species were rare or endangered in the spirit of the Federal list. Also examined was the nature of the limited population: special habitat, extremity of range, or endemic. The preliminary lists were published in 1979 and the official species list in 1980.

Although a rational basis now has been established for plant protection, there is actually no protection from landowners except possible use of broader laws which require environmental impact assessment and permits before some projects can be undertaken. (revised to April, 1980)

THE AMERICAN CHESTNUT IN THE GENESEE VALLEY REGION. Noelle Gibbs, State University College, Geneseo, New York, 14454.

Most of the Genesee Valley was in the former range of American chestnut, although the oak-chestnut type was restricted to well-drained sites in the vegetational maps available for preblight conditions. More than 25 years after the population was considered exterminated, except for sprouts of limited duration survival of several individual trees led to increased interest in natural survival and intervention by man in propagation.

Two notable efforts are in progress. Mr. Robert H. Scheutzow of the Town of Greece, Monroe County, collects and distributes seed from his own trees. He has developed directions for increasing success in germination and growth. Mr. Richard J. Cook, student at the University of Rochester is engaged in a wide-ranging assembly of information and experimentation, including cross-pollination of trees from scattered locations within the valley region.

Surveys in recent years indicate that the number of naturally propagated flower-bearing trees in the region is probably over 100, including one in Orleans County outside the general pre-blight range. The sites of active reproduction, however, are extremely few. Most larger trees are blighted to some extent, being resistant rather than immune. Most survival sites are relatively moist, with the conifer-hardwood mixture rather than the classic chestnut-oak. Red maple is probably the most consistent associate.

THE FERNS OF THE GENESEE VALLEY AND RELATED AREA, ALLEGANY COUNTY, NEW YORK. B. Hazlett, Houghton College, Houghton, New York, 14744.

The frequency and distribution of ferns in the Genesee Valley and related area are described. Ferns were collected at sixteen collection sites. The ecological distribution and taxonomic classification of the seventeen species and the five varieties collected are described. A catalog of the ferns collected is included.

THE MOUNTAIN FOREST COLLECTION OF THE FANCHER ARBORETUM. Robert A. Hellmann, Department of Biological Sciences, State University College, Brockport, New York.

The arboretum of the Department of Biological Sciences, S.U.C. Brockport, is devoted exclusively to the native trees, shrubs, and woody vines of New York State. Organized into reconstructions of natural habitats representative of various parts of the state, it is dedicated to the appreciation of our native forests. Section C-2, entitled "A Mountain Forest", is a representation of six forest habitats of the Adirondack region: an old forest burn, a spruce-fir forest, mixed northern hardwoods-hemlock, transitional hardwoods, postglacial bog, lowland forest.

Officially opened to public use on October 9, 1976, this section contains at present 282 specimens of various northern species, such as red pine, white pine, sugar maple, red maple, aspen, paper birch, hemlock, yellow birch, tamarack, spruce, fir, and mountain maple.

OBSERVATIONS AND EXPERIMENTS ON SEED GERMINATION FOR WOODY SPECIES OF TEMPERATE CLIMATE. James W. Kelly, Monroe County Parks Department, Rochester, New York.

Seeds representing 30 genera of temperate-zone woody plants were tested for germination after various periods of dormancy in refrigeration or stratification. These tests were supplemented by field observations of seedling development in some of the same and also additional genera. The combined information suggests definite patterns related to the general property of hardiness, and to specific physiological and environmental factors affecting germination. As a practical matter, the requirements of time, temperature, and moisture conditions differ greatly among the genera observed. The basic mechanisms may be relatively few in number, and particular attention is directed to internal regulation of embryo growth rate, and role of an oxidizable inhibitor which is indicated.

THE EFFECT OF DIFFERENT LIGHT INTENSITIES UPON THE PRODUCTION OF CHLOROPHYLL a AND b IN ELODEA SP. B. A. Marcus, Genesee Community College, Batavia, New York, 14020.

Elodea sp. was cultured in Chalkley's solution under 2.8 and 10.0 hectalux of light for eight weeks. At the end of this time, secondary growths were stripped from the plants, homogenized in cold acetone, and spectrophotometrically analyzed for chlorophyll a and b. Those plants grown under 2.8 hlux showed significantly higher concentrations of both pigments than those grown under 10.0 hectalux.

EARLY PLANT SUCCESSION ON A DREDGING SPOILS ISLAND IN THE SENECA RIVER OF UPSTATE NEW YORK. G. L. Miller, Division of Science and Mathematics, Eisenhower College, Seneca Falls, New York, 13148.

Early plant succession on dredged lake bottom spoils was studied during the first two years following exposure. Species invasion during the first year was dominated by Populus deltoides. The second year dominant was Scirpus validus. The coefficient of community similarity for the first two years was 61%. Two distinct moisture gradient species assemblages developed: (1) Populus - Salix - Solidago occurred on drier sites, (2) Scirpus - Lythrum - Verbena occurred on wetter sites. Fifty-eight species were identified during this investigation. Successful species invasion onto the island is directly related to seed dispersal mechanisms, with wind dispersed forms being the most common. The relationship between the origin of spoils, cultural entrophication of lakes and disposal of spoils is discussed. Soil nutrient analysis and biomass data indicate that the spoils materials represent an excellent substrate for plant production.

FOREST REPLACEMENT IN THE BYRON-BERGEN SWAMP. Franz Seischab, Rochester Institute of Technology, Department of Biology, Rochester, New York, 14623.

Association analysis was performed on trees, saplings and seedlings in the forests of the Byron-Bergen Swamp. Correlations of the occurrence of saplings and seedlings to trees were used to gain an insight to the replacement tendencies in these forests. The occurrence and distribution of trees, saplings and seedlings will be discussed.

SEASONAL CHANGES IN THE ALGAE OF SODUS BAY, WAYNE COUNTY, NEW YORK. James J. Secosky, Biology Department, State University College, Geneseo, New York, 14454.

Algae were collected and identified to genus level over a one-year period (September 1973 - October 1974). Some physical and chemical conditions were measured concurrently: secchi disc transparency, and the temperature, pH, and the orthro-phosphate levels of surface waters. The seasonal flux of algal flora was traced through the period of study.

At the beginning of the year when ice covered the Bay for two months, very few algae were found. The spring flora was dominated by diatoms, particularly Asterionella except at First Creek where attached Spirogyra was abundant. Other common genera were Fragilaria, Melosira, Tabellaria, and filamentous blue-green algae of the family Oscillatoriaceae.

The summer collections were much more diverse in genera. During June and July, many diatoms were still present, but green and blue-green algae began to appear. By August, Closterium, Spirogyra, Anacystis, Anabaena, and Aphanizomenon were found in all samples. A brief peak of Pandorina occurred in the spring. Ceratium, a dinoflagellate genus, was abundant for a short period around July 18th.

In the fall, many diatoms again appeared, with Melosira abundant. By October, the intense summer blooms of Anabaena and Aphanizomenon had subsided. Closterium was present except for one month throughout the four seasons.

The distribution of algae among samples revealed that slightly more genera were found in central than in peripheral locations of the Bay, and at least one sample from each area appears desirable in seeking representation for the Bay as a whole.

THE DETERMINATION OF FISH POPULATION DENSITIES NEAR A THERMAL OUTFLOW BY ECHO-SOUNDING. J. F. Storr, W. S. Lifton, and B. R. Clark, Biology Division, State University of New York at Buffalo, Amherst Campus, Amherst, New York, 14260.

During the past seven years echo-sounding with the use of a Ross Fine-Line Echo-Sounder has been used to determine densities of fish around Rochester Gas and Electric's R. E. Ginna Nuclear Power Plant. Use of this technique has enabled determination of fish numbers around the thermal outflow and cooling water intake, as well as certain aspects of fish behavior. No other technique offers the ability to give quantitative estimates of fish numbers over large areas or open systems such as Lake Ontario. In addition, both vertical and horizontal distribution can be determined.

Studies have shown diurnal variation in fish activity with a decided movement off the bottom during the night. In addition, the size of schools of fish have been estimated and the clumped nature and distribution of fish schools verified.

Panel Discussion

PROTECTION OF PEOPLE FROM CHEMICAL HAZARDS IN THE ROCHESTER REGION. Rochester Committee for Scientific Information (RCSI).

The afternoon session at Monroe Community College included a panel sponsored by the RCSI titled, "Protection of People from Chemical Hazards in the Rochester Region - Finding and Stopping Environmental Causes of Illness."

Participants on the panel included: Richard Burton, Associate Chemist, Monroe County Department of Health; David Boyce, Supervisory Industrial Hygienist, Rochester Office of OSHA (Occupational Safety and Health Administration); Robert Collin, Toxic Substances Coordinator, New York State Department of Environmental Conservation; Bradford Patterson, M.D., Associate Director of Extramural Programs, University of Rochester Cancer Center; and Frank Smith, Department of Radiation Biology and Biophysics, University of Rochester The panel was moderated by Herman Forest, Biology Department, SUNY at Geneseo.

Following brief remarks by each panelist on the current status of identification and elimination of chemical hazards in the Rochester region, questions were invited from the audience. The session produced much good information and enabled valuable lines of communication to be established among the panelists.

ROBERT DODD COFFEE

FELLOW
1977

Since early in his life Robert Dodd Coffee has wanted to know the answers to questions. A native of East Orange, New Jersey, Robert began his search for answers at the Newark College of Engineering, now the New Jersey Institute of Technology, where he graduated in 1942 and went on to obtain his doctorate from the University of Wisconsin in 1949 in chemical engineering. There he was an American Institute of Chemists' Scholar and a Wisconsin Alumni Research Fellow. Besides documenting his professional career with numerous patents and scientific papers and his recognition by his peers as a pioneer in the field of chemical safety, his spare time activities have warranted recognition by his associates. He has served as safety consultant for the U.S. Department of Transportation. He is supervisor of technical safety at the Eastman Kodak Company, and a member of many professional societies, including the American Chemical Society. Yet Robert carries his curiosity into his spare time as well, and it is for this continuing quality that we now honor him.

His first association in the Academy was a member of the Mineral Section where he early became involved in fluorescent minerals from Franklin, New Jersey, discovering or participating in the discovery of at least five new fluorescents from this area. More recently he has been involved with the Genesee Ornithological Society. With his marked enthusiasm for photography and innate curiosity other sections of the Academy may yet claim him as an active member. He has served as Field Trip Chairman, Curator and Director for the Mineral Section, and a Councilor for the Academy.

The Rochester Academy of Science is pleased to welcome Robert Dodd Coffee as a Fellow.

HAROLD DIES MITCHELL

HONORARY MEMBER
1977

Harold Dies Mitchell began his lifelong devotion to birds and the out-of-doors in the woods of eastern Massachusetts as a teenager. Since then he has become western New York's outstanding lay ornithologist. The founding of the Buffalo Ornithological Society in 1929 and the Buffalo Audubon Society came largely from his energy and foresight. They have provided models and inspiration for birding and conservation clubs throughout the State. He is a chemical engineering graduate from the Massachusetts Institute of Technology. In his work as a distributor of machinery, he traveled widely through western New York - always with his binoculars and notebook. With Clark Beardslee he began in the 1930's the gathering of data for the "Birds of the Niagara Frontier Region" which was published in 1965. This monograph stands as a model for regional works on ornithology and is an outstanding contribution to the avifaunal literature of the State.

Harold Mitchell recognized years ago that there should be cooperation between conservationists and sportsmen for mutual goals. Though not a sportsman himself, he joined them, and has been very active in promoting mutual understanding.

Harold is articulate in speaking out for what he believes is right - he insists upon careful and accurate observations before coming to conclusions. To others his knowledge and expertise are always willingly and enthusiastically given with pleasure in the sharing.

As scientist, lover of nature, conservationist, and as a fine friend and companion, Harold Dies Mitchell well deserves the honor we pay him tonight.

ELIZABETH YOKI PIXLEY

FELLOW
1977

Elizabeth Yoki Pixley was born of Finnish parents in Hancock, Michigan. She obtained her bachelor's degree from Albion College, Michigan with a major in biology and a minor in art. She was elected to the Phi Beta Kappa honorary society and later pursued graduate studies at Cornell University. Her Master's thesis, "A study of the ontogeny of the primary xylem in the roots of Lycopodium," was published in the Botanical Gazette. Additional graduate work at Michigan State University and the University of California at Los Angeles was followed by summer study at the Cornell University Isles of Shoals Laboratory, a marine biology station on Star Island, off the coast of New Hampshire.

Elizabeth has taught various botany and biology courses at Cornell University, Nazareth College of Rochester, the University of Rochester, the University of California at Los Angeles, St. John Fisher College, the Monroe Community College, and the Rochester Museum and Science Center.

During 1970-1971 she was president of the Rochester Area Botanical Faculty and from 1971-1973 chairman of the Botany Section of the Rochester Academy of Science. Since 1975 we have been honored to have her as president of the Rochester Academy of Science. Her leadership and enthusiasm through Saturday Workshops and other means has helped vitalize the extensive herbarium of the Academy. Mrs. Pixley with all her contributions to science and education finds time for a full family life with husband Dave, and children Dawn and Thomas.

For her many contributions to botany, biology, education and to our own Academy, the Council is proud to elect Elizabeth Yoki Pixley a Fellow of the Rochester Academy of Science.

ROCHESTER ACADEMY OF SCIENCE

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