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Concurrent Session No. 1

J. Makarewicz, presiding

HOLOCENE AND LATE PLEISTOCENE GEOMAGNETIC SECULAR VARIATION IN THE EASTERN GREAT LAKES REGION. W.J. Brennan, M.J. Hamilton and R.K. Kilbury, Dept. Geological Sciences, SUNY Geneseo, Geneseo, New York.

Geomagnetic secular variation records have been obtained from seven Alpine piston cores from Lake Ontario. The cores, 7.3 meters long, were collected along with high resolution seismic reflection profiles in order to correlate lithology, acoustic stratigraphy and geomagnetic secular variation. All of the coring sites were located in water 98-175 meters deep, and the cores show no evidence of unconformities. The cores penetrated Holocene and glaciolacustrine sediments and, in two cases, the underlying till which is approximately 12,300 years in age. Magnetic, acoustic and lithologic correlation between the cores is excellent.

The geomagnetic secular variation record obtained from the cores is continuous from the present to 12,300 B.P. This record is overlapped by that of an earlier interval (12,000 B.P.-13,500 B.P.) obtained in a previous study of exposures of older glaciolacustrine clay, which was deposited in a succession of proglacial lakes that the deglaciation of western New York. As a result of the onlap of the older glaciolacustrine clay upon the underlying till, the earlier geomagnetic secular variation record is synchronous with the retreat of the ice front. The composite geomagnetic secular variation record is continuous to approximately 13,500 BP. Vary good magnetic agreement is observed between the Lake Ontario cores and several cores reported from the western Great Lake region.

No evidence of geomagnetic excursion observed in the cores; however, one excursion observed in an exposure of the older glaciolacustrine clay was found to be the result of mechanical deformation.

MIREX AND PCB RESIDUE LEVELS, TISSUE RESPONSE AND REPRODUCTIVE EFFECTS IN PRAIRIE VOLES FED LAKE ONTARIO COHO SALMON. T.A. Dillon and K.H. Martin, State University Research Center at Oswego (SURCO), King Hall, SUNY Oswego, Oswego, N.Y.

Mirex, an organochlorine pesticide used for controlling fire ants in the southeastern United States, poses an environmental hazard in the Lake Ontario region. Mirex as well as PCB's were detected in residue analysis of Lake Ontario fish, resulting in a partial fishing ban on lake Salmonids.

Many previous studies have documented the dietary effects of the pure contaninants. In an attempt to determine the effects of an environmentally contaminated food source, we observed the results of a chronic diet on the reproductive response of a small mammal, the prairie vole. Mirex and PCB levels and histopathological responses were determined in the tissues of the experimental animals and their offspring.

Three weeks prior to pairing, the prairie voles were introduced to a diet consisting of 70% lab chow and 30% ground salman. Pairs were examined daily for surviving young. Animals were sacrificed from 20 to 50 days after pairing. Various tissues were removed for pathological exam and chemical residue analysis utilizing GLC. Effort was made to correlate histopathological finds with tissue residue levels.

NATURAL SALT LOADING TO IDES COVE, NEW YORK. G. Pesacreta and J.C. Makarewicz, Biology Dept., SUNY Brockport, Brockport, N.Y.

Ides Cove is a small, deep, isolated body of water off Irondequoit Bay, N.Y. Sources of salt loading to the hypolimnion include groundwater stream inflow, surface runoff of de-icing salt and pore water diffusion. De-icing salt use prevented complete circulation of the water column in 1970-71. However, the level of application of de-icing salt has decreased in recent years. Because of the natural loading of salt from streams, the cove experienced an unusual complete vertical circulation during ice cover in 1979-1980.

THE INTERACTION BETWEEN SODIUM AND BLUE-GREEN ALGAE: PAST FINDINGS AND PRESENT RESEARCH POSSIBILITIES.
D. McKellar, Biology Dept., SUNY Brockport, Brockport, N.Y.

A study of recent literature suggests that the detrimental effects of increasing sodium concentrations in aquatic freshwater systems may be correlated to qualitative and quantitative changes within phytoplankton communities. Both in vivo and in vitro research indicates the need for further examination of the interaction between sodium concentration and the growth of blue-green algae.

Statistical analysis of phytoplankton data from Lake Michigan indicates that the increase in biomass and relative abundance of blue-green algae is highly correlated with the mounting ambient concentrations of sodium; these concentrations have been found in laboratory experiments to induce positive growth responses. Increases in other monovalent cations may also play a significant role in stimulation of growth via uptake of phosphate and storage as polyphosphate bodies.

With sources of sodium including sewage effleunt, road de-icing and waste products of industrail processes, all of which are unlikely to be decreasing within urban areas, knowledge of consequences of input of sodium is essential. Ongoing research may provide some data as to the complex relationship between sodium, phosphate and blue-green algal growth.

BRISTOL VALLEY LOG. R.A. Sanders and R.D. Hamell, Dept. Geosciences, Monroe Community College, Rochester, N.Y.

Our attention was brought to a log that was dug up by Phillip Green in Bristol Valley through George R. Hamell, Associate Curator of Anthropology, and Marion Schwartz, Geologist, both at the Rochester Museum and Science Center. We took a trip to observe the location and note any glacio-stratigraphic relationships.

The excavation was located on the west side of Bristol Valley about one mile southeast of the town of Bristol and about four-tenths mile northeast of Mayweed Corners (Bristol Center 7½ Quad.). The first obvious feature of the valley was the south-to-north slope. This can best be explained by a valley train deposit being spread northward from the south end of the valley.

The program through 1979 included sampling at RG&E's Ginna and Sterling Sites, while in 1980 sampling locations at Souds Bay, RG&E's Russell Station and Braddocks Bay have been added. Txis tagging is currently being conducted once per month (including winter at Ginna) and presently combines trap nets and electro-shocking. Electro-shocking is proving to be more versatile, mobile and cost-effective than trap netting for this type of study. Floy dart tags, imprinted with an address and offer for reward are used to tag the fish.

Since 1973 RG&E has tagged over 12,000 fish within Lake Ontario with a resultant return rate of nearly 4%. Lake Ontario Anglers account for over 90% of the tag returns. Brown trout returns (14.7% of brown trout tagged) are primarily from Ginna or show movement to the east. Yellow perch returns (11.1%) show movement towards Sodus Bay in late Fall from Ginna, and a fairly even east and west movement from Sterling. Smallmouth bass returns (9.8%) show little movement from Ginna, and a slight westward movement from Sterling. Rock bass returns (7.4%) show a fairly uniform dispersal along the entire southern shoreline, although concentrations are seen at Ginna and in the various bays between Ginna and Sterling. Rainbow trout (6.5%), brown bullhead (4.1%), white bass (4.1%), and pumpkinseed (3.5%) returns were also investigated. Time and distance between tagging location and re-capture point indicate little significance from the thermal discharge at Ginna with respect to overall movement by most species.

THE BYRON-BERGEN SWAMP AS IT RELATES TO THE CLASSIFICATION OF WETLANDS. F.K. Seischab and P. Garrisi. Rochester Insitute of Technology.

The classification of the Byron-Bergen Swamp will be discussed as it relates to the rich fen - poor fen - bog classificatory scheme. Water chemistry of samples from 14 stations in 7 community types will be discussed. Water pH, specific conductance and calcium and magnesium concentrations indicate the system should be classified as a rich fen. Water phosphate and iron determination indicate that the system represents an exception to the above mentioned classificatory scheme.

Calcium concentrations of 110-365 ppm were observed. High levels of calcium carbonate in these waters results in the precipitation of phosphorus and iron. This results in a phosphorus and iron limited system which should be considered nutrient poor.

Mr. Green led us to believe the log came from below a gravel layer which would represent outwash of the valley train. The valley train was underlain and overlain by lacustrine silts. If the log was found below the gravel as stated by Mr. Green, it would have indicated the presence of glacial ice in the adjacent valley, and a lake in Bristol Valley, with deciduous softwood trees such as poplar and willow growing on the interfluves. This would have indicated a rather temperate climate adjacent to the wasting ice sheet.

The Carbon-14 date of 3,465 ± 95 years B.P. was much too young; therefore the log must have been located in the lacustrine silts above the valley train gravels. The tentative conclusion is that Mr. Green mistook the exact stratigraphic sequence from which the buried wood was taken. It apparently was mixed during excavation.

Geologically, the above would indicate the log sank into lacustrine silts in a lake (Bristol Lake?) that existed a little over 3,000 years B.P., which was subsequently drained and covered with alluvial fan deposits from the sides of the valley.

The tentative identification of wood samples was done by Dr. Barry Rock, Alfred University, Alfred, New York. At present, exact determination is lacking. However, the tentative gender is a species of Carpinus caroliniana (American Hornbeam), Salix sp. (willow), or Populus sp. (popular). Leaf impression were found but none were retained, as we expected to return to do more comprehensive study and collecting at this site.

CURRENT FINDINGS OF RG&E'S FISH TAGGING PROGRAM ON LAKE ONTARIO. P. Sawyko, Rochester Gas and Electric Corp., 89 East Ave., Rochester, N.Y. 14649.

Through a complex series of annual aquatic ecological studies, RG&E has developed an extensive knowledge of the fish population fluctuations with Lake Ontario and has defined many changes in species composition and abundance throughout the years. One of the most informative, convincing, and public-oriented programs to date has been the fish tagging studies conducted in Lake Ontario by RG&E. The tagging program provides information on fish movement in the South to East sector of the lake, which is used in assessing the impact of thermal discharges on the fish community. Information such as residentce, growth rates, population size and range, or the existance of subpopulations may be acquired through these studies.

THE ROLE OF NEW YORK STATE IN THE ACID PRECIPITATION PROBLEM. J. Warner, Biology Dept., SUNY Brockport, Brockport, N.Y.

Acid precipitation, the phenomenon of increasingly acidic rain and snowfall, has gained attention in the last decade as a serious environmental problem. An increasing amount of gaseous pollutants, such as oxides of sulfur and nitrogen originating primarily from the combustion of fossil fuels, are picked up by the prevailing winds, converted to acids in the atmosphere and released in rain and snow hundreds of miles downwind from the source. Although most of the eastern half of the continent has been subjected to acidic precipitation, the areas most affected, such as the Adirondack Mountains of New York, are those with a delicate ecological balance.

New York State has taken an active role in the acid precipitation problem, and much has been done on the state level. Although many believe that only federal intervention will bring about a final solution, each state has an important role to play. New York's strong lead could provide incentive for more efficient interaction between the involved states and the federal government. However, internal conflicts of a political and economic nature can prevent New York from being as effective a model as it could be. New York has a valuable niche to fill and can go far in helping to create an atmosphere of interaction and communication among the parties involved.

Concurrent Session No. 2
D. Zallen, presiding

EFFECT OF RETINOIDS ON PLATING EFFICIENCY, SISTER CHROMATID EXCHANGE (SCE) AND MITOMYCIN C INDUCED SCE IN CULTURED CHINESE HAMSTER CELLS. Lesley Burton and Samuel R. Sirianni, Dept. of Biology, Niagara University, New York 14109

Many investigators have shown that retinoids have important biological effects on cells including the ability to alter the process of carcinogenesis. An intensive inquiry from a variety of experimental approaches has been undertaken to elucidate the mechanism(s) involved in producing these effects. Despite this, reports dealing with the cytogenetic effect of retinoids are quite scanty in the literature.

The purpose of this study was to examine the effect of all-trans-retinol (ROL), all-trans-retinoic acid (RA), all-trans-retinal (RAL), all-trans-retinyl acetate (RAc) and Ro. 10-9359-TMMP ethyl retinoate on plating efficiency, SCE and on Mitomycin C (MMG) induced SCE in the Chinese hamster cell line V79. The results indicated that there was an obvious difference in the ability of the retinoids studied to reduce plating efficiency in this system. RAL was the most potent reducer of plating efficiency and this was followed in decreasing order by ROL, RAc, RA and Ro. 10-9359. It was also clearly demonstrated that addition of each of the the 5 retinoids to exponentially growing V79 cells had no significant effect on SCE frequency as compared to the control values. Finally, SCE frequencies were studied in cells which had been pulse treated for 3 hours with MMC and then treated with various doses of a retinoid continously for 24 hours. The data presented indicated that MMC alone induced an expected SCE increment for each experiment and that the addition of any one of the 5 retinoids did not significantly alter this increment. In as much that SCE presumably reflects cellular recombination activity, the SCE data reported here does not maintain a mechanism of action of retinoids based on mitotic recombination.

SULFATE ASSIMILATION MUTANTS OF THE EURYHALINE ALGA DUNALIELLA. E. emborsky and A.H. Latorella, SUNY Geneseo, Genseo, N.Y. 14454.

Mutants of the sulfate assimilation pathway of Cunaliella tertiolecta were selected by their $SeO_4^=$ resistance. It is hoped that some of these mutants will complement nitrate assimilation mutants to allow the selection of fusion products.

D. tertiolecta was found to grow on $SO_3^=$, $S_2O_3^=$, $S^=$ and cysteine as alternative sulfur sources to $SO_4^=$. The optimal concentrations of these for growth were established as was the ratio of $SeO_4^=$ to $SO_4^=$ necessary to fully inhibit growth of wild-type cells. Mutants were selected from U.V.-treated cultures grown in the presence of $SeO_4^=$. The mutants were tested for their ability to grow on $SO_3^=$, $S^=$ and cysteine.

THE AGING OF MURINE SERTOLI CELLS IN CULTURE: STRATEGIES FOR SURVIVAL? S. J. Hitzeman, Dept. of Biological Sciences, SUNY Brockport, Brockport, New York.

Primary explants of testicular cells from 30, 46, and 60-day mice are cultured at low densities to prevent confluence. After a week the cultures contain about 95% Sertoli cells. These retain their ability to phagocytize germ cells, accumulating oil-red-O stainable droplets of triglycerides. Although rodent Sertoli cells stop dividing in vitro after 15 days postpartum, the cultured cells take up (^3H) thymidine. As the non-passaged cells age, they establish cytoplasmic bridges and fuse, becoming synkaryons. The number of binucleate cells increases for about 3 weeks, after which giant nuclei become more common. Death is associated with nucear blebbing and cytoplasmic vaculation.

NITRATE ASSIMILATION MUTANTS OF THE EURYHALINE ALGA, DUNALIELLA TERTIOLECTA. A.H. Latorella, S.K. Bromberg, K. Lieber, D. Sloane, SUNY Geneseo, Geneseo, N.Y. 14454.

There has long been a need to investigate the genetics of slinity adaptation by the euryhaline alga, Dunaliella tertiolecta. To subject D. tertiolecta to genetic analysis, it must be possible to recover sexual or parasexual fusion products. Toward this end, we

have endeavored to isolate auxotrophic mutants of the nitrate assimilation pathway, some of which might be capable of genetic complementation.

Nitrate assimilation mutants were selected after U.V. treatment by their resistance to chlorate, an alternate substrate for nitrate reductase. Chlorate resistant mutants were tested for their ability to grow on NO_3^-, NO_2^- and NH_4^+. Of 80 chlorate resistant mutants tested, 10 could not use NO_3^- but could use NO_2^- as a nitrogen source. Neither NO_3^- nor NO_2^- could be used by 5 other mutants. All mutants were capable of using NH_4^+. The mutants were assayed for nitrate and nitrite reductase activity using reduced methyl viologen as a reductant and for their ability to complement each other *in vitro*.

IMMOBILIZATION OF *ZYMOMONAS MOBILIS* ON AN ACTIVE ALUMINA COATING. C. Marchioli, C. Shively, Dept. of Biology, Alfred University, Alfred, N.Y.

Modified ceramic Rachig rings (Clyde rings) and fragments of rings were coated with an active alumina preparation utilizing several different procedures to determine if *Z. mobilis* could be immobilized.

Prepared rings and fragments were sterilized and suspended in a glucose yeast extract medium. The medium was inoculated with a 10% v/v seed culture of *Z. mobilis* ATCC# 10988 and incubated on a stirrer for 36 hours at 30C. After incubation, rings and fragments were removed and dipped in sterile distilled water to remove unattached cells. To determine if immobilization occurred, rings were then immersed in vessels of the same medium. After incubation, cell masses were determined from 100 ml. aliquots of media. Growth should be directly related to the numbers of bacteria immobilized on the ring coating. Cell mass data revealed that rings twice spray coated were approximately six time more effective in immobilizing bacteria than controls. Observation of fragments with the scanning electron microscope confirmed the cell mass data.

THE ROLE OF AFRICAN RELIGIOUS RETENTIONS IN CONTEMPORARY URBAN SOCIETIES IN NORTH AND SOUTH AMERICA. Angelina Pollak-Eltz, Universidad Catolica Andres Bello, Caracas, Venezuela (currently a Fulbright Professor of Anthropology at Syracuse University, Syracuse, N.Y.).

Afroamerican syncretistic cults developed in many Latin-american countries during slavery and after emancipation also spread to other ethnic groups at the same time beingmodified in order to suit the spiritual needs of a rising urban class. The cults are essentially utilitarian in nature. The rites are supposed to solve the problems of the faithful, related to health, employment, love and social relationships here and now. Altered states of consciousness are of great importance, as well as the direct contact of the believers with the divine spirits through the mediums in trance. In recent years, due to Cuban and Caribbean immigration, such cults also spread to Northamerican cities, principally to Miami, where they were often also embraced by Northamerican blacks in search of a symbol of ethnic identity. Different cults in Brazil, Venezuela and Northamerica are briefly discussed.

DEFECTIVE REPAIR OF UV-INDUCED DNA DAMAGE IN A recL MUTANT OF ESCHERICHIA COLI. Robert H. Rothman, Dept. of Biological Sciences, SUNY Brockport, Brockport, New York 14420.

The recL mutation was originally isolated in a search for mutants defective in genetic recombination. The mutation causes an increase in UV sensitivity. This is due to a reduction in the ability of the mutant to remove UV-induced pyrimidine dimers from its DNA. Excision consists of 4 steps: nick adjacent to the dimer, simultaneous removal and resynthesizesis of the damaged DNA, and joining of the newly synthesized patch to the undamaged DNA. The recL mutation causes dimers to be removed slowly and the resulting repair patch to be 10 times longes than the patch observed in the wild type strain. The excision/resynthenis step is carried out by DNA polymerase I. It is suggested that the function of the normal recL protein is to limit the extent of rplacement to about 20 nucleotides. In the mutant, however, polymerase I is not subjected to the proper control and the amount of removal and replacement is much greater.

THE LINKAGE ANALYSIS APPROACH TO THE PRENATAL PREDICTION OF GENETIC DISORDERS. D. Teichler-Zallen and R. Doherty, Nazareth College of Rpchester and The University of Rochester School of Medicine and Dentistry, Rochester, New York.

During the past decade, the possibility of detecting significant fetal chromosomal, biochemical, and structural abnormalities has revolutionized the practice of clinical genetics. In addition to providing counselling about odds of recurrence for families at risk for single gene as well as multifactorial disorders, it is now possible by analyzing components of amniotic fluid, obtained by second trimester amniocentesis, to assure parents at risk that many fetal chromosomal, biochemical, and structural abnormalities are not present. However, for the vast majority of birth defects, no such direct structural or biochemical signal is known, and prenatal detection is not possible.

An indirect method of potential usefulness for prenatal prediction of fetal genetic abnormality involves the use of linked genes as genetic markers. There is no method currently available by which the presence of the mutant gene for myotonic dystrophy, a form of muscular dystrophy caused by an autosomal dominant gene, can be directly determined in the fetus. The discovery of the close linkage between the myotonic dystrophy locus and the secretor locus may enable use of the secretor phenotype as an indicator marker for the myotonic dystrophy gene. To assess the reliability of amniotic fluid secretor phenotyping for prnatal prediction of myontonic dystrophy, secretor status determinations were made on 89 amniotic fluids obtained by second trimester amniocentesis and were compared with results of postnatal secretor typing of saliva samples collected from the resulting 89 offspring. The secretor types of the paired amniotic fluid-saliva samples were in agreement in all cases. Our results show that amniotic fluid secretor typing accurately reflects the secretor status of the fetus and can be used in those families who meet the necessary genetic prerequisites for this analysis.

In addition to the linkage of the secretor locus to the gene for myotonic dystrophy, other linkages have been assigned which may be useful for genetic counselling and, in some cases, for prenatal diagnosis. Thus, linkage analysis is likely to become an increasingly important tool in the prenatal prediction of heritable fetal abnormalities.

Concurrent Session No. 3

E. Southwick, presiding

RARE AQUATIC PLANTS IN THE GENESEE VALLEY REGION.

H.S. Forest, SUNY Geneseo, Geneseo, N.Y. 14454.

In the recently completed summary of aquatic flowering plants in the Genesee Valley region (Forest, Rugenstein, and Mills, 1977, 1980), approximately 40 of the total of 300 were listed either as no longer present or else were found only a limited number of times or in few places. This is about 13% of the total. In addition, the decline of diversity in submerged plants has been well documented for the western Finger Lakes-Ontario Bays area and a preliminary report published (Kimber, 1977). The current study was undertaken because of these rather disturbing indications of habitat destruction and general decline of environmental quality, and in cooperation with the State-wide effort to identify and protect rare and endangered species.

On careful examination the preliminary list proves to be heterogeneous. Some species were extirpated by the early 20th Century; some have entered the region during the past Century or more, but established only tenuously; some natives have persisted in only a few localities; and some have been extirpated clearly as a result of declining water quality and destruction of wetlands. In addition, a few cases are simply nomenslatural or identification problems, not floral phenomena.

In summary, the decline of species, and its relation to environmental misuse is clear enough, although natural factors are involved. The damage may be greater; not less, than estimated from first examination. Two needs are indicated: supoort for systematic and thorough floral survey work, and the regular monitoring of certain notable sites, such as Braddocks Bay, Mendon Ponds, and Bergen Swamp. One optimistic observation is added: submerged species are returning to Irondequoit Bay following diversion of much of its waste load.

PRELIMINARY RESULTS OF A VASCULAR PLANT SURVEY OF ONTARIO COUNTY, NEW YORK. Bruce Gilman, Community College of the Finger Lakes, Canandaigua, New York 14424.

Despite the fact that Canandaigua is the home of the second oldest botanical society in the northeast, the Ontario County region has largely not been studied for its flora. This report is the first countywide checklist to be published.

Background histroical research was completed at the herbarium collections of the Rochester Academy of Science, Hobart College and the New York State Museum. A specimen sheet by specimen sheet survey, assisted by the CCFL college workstudy program revealed approximately 500 species of historically collected plants in the county. Specimens dated back as far as 1868 and as recently as 1972.

Field investigations commenced in the early spring months and ceased in mid October. In total, 32 sites were visited and over 1000 specimens collected. Subsequent preservation and identification of specimens brought the preliminary checklist total to approximately 1200 vascular species. Unusual species and habitats will be highlighted in this presentation.

THE USE OF A MICROBIAL ENZYMATIC METABOLIZER IN A COMPARATIVE PLOT STUDY OF BUCKWHEAT. J.I. Mosher, Ph.D., Biology Dept., SUNY Brockport, Brockport, New York 14420.

The purpose of this study was to compare biomass of buckwheat grown on meter square plots with varying soil treatments.

A commercially produced microbial enzymatic metabolizer, BX, a product of V & J Petrik Laboratories of Woodland, California was used in this study as an organic fertilizer.

The study plots were prepared in a field on the Fancher Campus of S.U.N.Y. Brockport, N.Y. which had been depleted by presently popular methods of agriculture practice.

The study area was rototilled and then marked off into nine one meter squares. Each one meter square plot was planted and treated as follows: three plots were planted with buckwheat only, two plots with buckwheat and BX, two plots with buckwheat and manure, and two plots with buckwheat, manure and BX.

The best seed germination and plant growth was on those plots with BX and manure, the pooorest on plots with the soil as originally rototilled with no amendments.

A PILOT STUDY COMPARING THREE METHODS OF BIOLOGICAL PLANT PRODUCTION. J.I. Mosher, Ph.D, Dept. Biological Sciences, SUNY Brockport, Brockport, N.Y. 14420.

This study's purpose was to compare plant production and soil improvement using three methods of "organic gardening" on soil which had been depleted by currently popular agricultural methods.

The study was conducted on the Fancher Campus of S.U.N.Y. Brockport, New York.

Three experimental gardens 11 x 14 meters each were prepared and planted. One study plot was prepared and planted according to the Dr. E. E. Pfeiffer plan for a Bio-Dynamic field spray, root and leaf treatment. One plot was planted using a Genesa (meter circular) system developed by Dr. D. G. Langham. This garden also received the B-D field spray, root and leaf treatment. A third plot was prepared using the Dr. D. G. Langham Genesa system with no Bio-Dynamic treatment of any kind.

The hypothesis was that by combining Genesa with Bio-Dynamic plant production would be greater than either system alone.

Soil fertility improved considerably over the growing season. The highest production was in the Bio-Dynamic study plot (E. E. Pfeiffer plan).

A "LUCKY HIT" THEORY OF NECTAR FORAGING. E.E. Southwick, Dept. of Biological Sciences, SUNY Brockport, Brockport, N.Y. 14420.

Nearly 2000 nectar samples were collected from 13 species (10 families) of spring flowering plants in western New York. Samples taken at 2-hr intervals over 24 hrs were analyzed in the field for vloume/blossom and sugar concentration (sucrose equivalent). In most plants sampled, blossoms yielded smaller amounts of nectar after mid-day. In mid-afternoon (1500), it was necessary to sample many blossoms (100-300) to obtain sufficient volumes for analyses. Rarely encountered single blossoms contained relatively large volumes of nectar. We arbitrarily designated such blossoms "Lucky Hits" if volumes were greater than 2x the nominal volume. Such "Lucky Hits" comprised 1 to 8% of the blossoms in Lonicera, Aesclepias, and Glechoma. "Lucky Hits" are likely to be an important aspect of energetics and behavior in nectarivores.

CHARACTERISTICS OF NECTAR AND NECTAR FEEDERS IN ASCLEPIAS. E.E. Southwick and S.E. Sadeick, Dept. of Biological Sciences, SUNY Brockport, Brockport, NY 14420.

Flowers of Asclepias syriaca were sampled for nectar utilizing 5 µl glass micropipets. Samples were frozen and later analyzed qyantitatively for sugars by high performance liquid chromatography. It was found that the nectar was almost a pure sucrose solution with a sucrose-hexose ratio in excess of 150. Bagged blossoms open toexploitation by nectarivores. Nectar available in blossoms amounted to an average of 1.9 µl with a sugar concentration of 32.3 g. sugar/100 g. solution. Total sugar available per blossom averaged 0.70 mg/blossom yielding 2.76 cal of energy or 1.45 cal/µl. Nectar feeders included hymenopteran pollinators, with honey bees, Apis mellifera, being the most frequent visitors (43% of total). Dipterans, l pidopterans and coleopterans also fed on the nectar. Nectar was robbed by ants (Formicidae), primarily at night.

A PRELIMINARY REPORT ON THE DISTRIBUTION OF CALCIUM OXALATE CRYSTALS IN GOLDEN ROD. George Wolfe, SUNY Genseo, Genseo, New York, Barrett Rock, Alfred University, Alfred, New York, Paul Johnson, New York State College of Ceramics, Alfred University, Alfred, New York, Edward Ritter, SUNY Geneseo, Geneseo, New York.

Crystals of calcium oxalate were obtained from several species of Solidago. The crystals ere obtained in both the monhydrate and dihydrate forms after homogenization of the plant material in acetone. The crystalline structure was examined under polarized light and scanning electron microscopes; calcium structure was verified by x-ray diffraction and thermal gravimetric analysis.

The species of Solidago show a variety of crystalline shapes, with the monohydrate raphide form as the predominant one in all species. Other crystalline forms were demonstrated in association with the needle-like raphides. Species groupings based upon crystal distribution is suggested.

HACKBERRY (CELTIS OCCIDENTALIS L.) OF THE GENESEE COUNTRY. Marcelle Youngman and Bruce Gilman, Community College of the Finger Lakes, Canandaigua, New York.

Celtis occidentalis is a member of the Elm family uncommonly distributed in the northeastern United States. Fewer than twenty sites have been historically located in the Genesee country. This apparent rarity occurs because of the species limited migration along major river corridors and is furthered by human disturbance of these riparian sites.

Observation of one local Hackberry stand seems to indicate a viable, reproducing population. Size class distribution analysis methods have confirmed this observation.

Concurrent Session No. 4

R. Beason, presiding

INFLUENCES OF WEATHER ON SONGBIRD MIGRATION IN THE SOUTHWESTERN UNITED STATES. Robert C. Beason, Biology Dept., SUNY Geneseo, Geneseo, N.Y. 14454.

Songbird migration was observed at 6 sites in the southwestern United States during 1973-1974. Data were collected using radar and direct visual techniques. The most important weather variable influencing both autumn and spring migration was wind direction. It influenced both the number of migrants aloft, as well as the orientation of migration. More passerine migration occurred when the winds were blowing in seasonally appropriate directions, and the birds tended to fly more or less downwind. The only other variable that influenced migration was temperature. Very little migration occurred when the surface temperature was below freezing.

THE EFFECT OF DENSITY ON VERTICAL MIGRATION OF *DAPHNIA MAGNA*. M.J. Calaban and J.C. Makarewicz, Biology Dept., SUNY Brockport, Brockport, N.Y.

The effects of temperature and density on the vertical migration of *Daphnia magna* were studied under controlled conditions in plexiglass tubes (120 cm high and 10 cm in diameter). Vertical migration was found to be inhibited by the presence of a thermocline. Salts were added to the bottom layer of water to induce the same density barrier found in the thermal stratification experiments, but without temperature effects. Organisms migrated through the halocline suggesting that temperature avoidance is the causal factor involved. Epilimnetic plankters may be restricted to the epilimnion due to their acclimation to a narrow range of temperatures.

GEOGRAPHIC DISTRIBUTION OF VIRGINIA VALERIAE PULCHRA (REPTILIA: SERPENTES) WITH PRELIMINARY COMMENTS ON HABITAT AND THEIR ORIGIN. Thomas H. Cervone, Richard C. Bothner, Dept. Biology, St. Bonaventure University, St. Bonaventure, N.Y. 14778.

Since Neil Richmond's description (1954) little information other than locality records and litter sizes has been compiled for the Mountain Earth Snake, Virginia valeriae pulchra. This is a small, very secretive, sedentary snake inhabiting specific sites within the unglaciated portions of the Allegheny Mountains of Pennsylvania, Maryland, and West Virginia. Our preliminary studies indicate a positive correlation of its habitat with sandy soil, surface or ground water, and Formica exsectoides (Hymenoptera: Formicidae) mounds. This is a woodland-clearing snake, preferring sandy, colluvial, and moderate to well-drained soils. It may be found under flat fine sandstone rocks or within leaf litter. Length of growing season appears to limit their range which is disjunct and extends from Warren County to Venango County alon the Allegheny River in the northwest and from Potter County to Clearfield County along the Susquehanna River in the Northeast. It is also found in Westmoreland, Somerset, (Maryland), and Preston County (West Virginia). These latter sites follow the course of the Youghiogheny River.

The authors suggest that Virginia valeriae pulchra originated as an intergrade from Virginia valeriae valeriae (Eastern Smooth Earth Snake) and Virginia valeriae elegans (Western Smooth Earth Snake) during the late Tertiary in the area of eastern Indiana. During the Pliocene, they probably dispersed along the Old Pittsburgh River and with the advent of glaciation durign the Pleistocene, Virginia valeriae pulchra was pushed south along the Old Upper, Middle, and Lower Allegheny Rivers. In the headwaters of the Pre-Pleistocene Allegheny Drainage, Virginia valeriae pulchra withstood Pleistocene climatic conditions and has moved very little since.

FISH DISTRIBUTION OF THE SHAWANGUNK KILL, LOWER HUDSON RIVER VALLEY, NEW YORK. L.E. Giovinazzo, G.M. D'Agostino, Biology Dept., St. Bonaventure University, and D.C. Krieg, Biology Dept., SUNY at New Paltz, N.Y.

A survey of fishes was conducted for the Shawangunk Kill and its major tributaries to determine the present distribution in this watershed. The last survey done in this area was in 1937. The 1937 survey was not an in depth survey for the Shawangunk Kill but includes samples from this stream as part of a larger survey for the Lower Hudson Watershed. Since 1937, two groups with conflicting interest have begum to collect inform ation on various parameters of the Shawangunk Kill. The PASNY would like to impound portion of this river for a pumped storage plant. The Shawangunk Valley Conservancy has encouraged various groups to asses the wildlife resources for possible designation as a recreational river. For this fish survey, 80 collections were made from August 1973 through October 1976. Collection sites were approximately 3 miles apart along the river and its major tributaries. A total of 2701 fishes were collected. These represented 28 species. This survey identified 6 species new to this watershed since the 1937 survey. The survey also indicated that 5 distinct habitats could be identified by geographical location and species present. The State Legislature has at this time already approved nomination of the portion of the Shawangunk Kill within Ulster County for study as a Recreational River. The Federal Government is also completing steps for Federal Recreational River designation of the Shawangunk Kill which would almost certainly prevent impoundment of the stream.

THE EFFECTS OF UNFAMILIAR MALE URINE ON FEMALE PRAIRIE VOLES (MICROTUS OCHROGASTER) IN REGARD TO THE MALE INDUCED PREGNANCY BLOCK. David J. Leece, SUNY Oswego, Oswego, N.Y. 13121

Eleven days after stud coitus, pregnant female voles were subject to direct contact with scent posts saturated with urine from an unfamiliar male. The number of subsequent abortions that occurred was compared to females allowed contact with scent posts saturated with urine from the stud male. A 40% increase of pregnancy failure was demonstrated by the experimental

females occurring within 72 hours of scent post introduction. Although final data analysis showed a low level of significance, it does suggest a strong correlation between the abortion response, and the role of urine as the vector of the initiating stimulus. Further attention was payed to behavioral aspects in regard to scent post introduction.

DISTRIBUTION AND DETECTION OF MELANIN IN THE LEOPARD FROG. Joan E. Nichols, Edward Ritter and Allen F. Reid, Dept. of Biology, SUNY Geneseo, Geneseo, N.Y.

Melanin distribution in the northern leopard frog Rana pipiens has been investigated in both light and dark conditions. The aggregation and dispersion of melanin on the dorsal surface is correlated with light and dark background rather than with temperature differences. Color change was achieved within a range of 4-30C with change typically occurring within 2 hours. No discernable melanin aggregation or dispersion could be detected in living animals regardless of beckground on the ventral surface.

Light microscope sections stained specifically for melanin show a consistent aggregated and dispersed pattern for the dorsal surface dependent upon background conditions. Melanin is also clearly evident in skin sections from the ventral surface. Shed skin obtained from dorsal and ventral surfaces and examined under phase and interference microscopy exhibit a pattern that enables it to be used as a simple "finger print" pattern to detect melanin distribution in the amphibian.

LIPASE AND PHOSPHATASE SECRETION BY HELIAMPHORA AND UTRICULARIA. R.E Stauffer, Fellow, Rochester, N.Y.

Application of cytochemical techniques of azo dye formation and localization to plants of the South American endemic pitcher plant, Heliamphora heterodoxa, of the family Sarraceniaceae, demonstrated acid phosphatase secretion by glands on the inside and outside of the leaves (pitchers). The reagents used were Naphthol AS-BI Phosphate and Azoene Fast Red PDC at a buffered pH of 4.43 provided by 0.2 Molar Acetate buffer (1).

Similar experiments utilizing p-Nitrophenyl Acetate and Azoene Fast Red PDC with 0,05 Molar pH 4.0 Potassium Hydrogen Phthalate buffer demonstrated lipase (acetase) activity in H. heterodoxa.

Phosphatase and acetase activities in H. heterodoxa were weaker than those observed in Sarracenia purpurea ssp. gibbosa (1), but this may have been a result of lower vigor in the leaf specimens used.

Further studies of Utricularia species (U. intermedia and U. cornuta of the family Lentibulariaceae by the same techniques have demostrated vigorous lipase (acetase) as well as acid phosphatase secretion in both species.

(1) "Cytochemical Studies of Acid Phosphatase Secretion by Carnivorous Plants", R.E. Stauffer, Proc. RAS, in press.

IS THERE A RELATIONSHIP BETWEEN AGE AND SPECIES COMPOSITION IN OLD FIELDS? Rachel Studer and A. Reid, Biology Detp., SUNY Geneseo, Geneseo, N.Y.

According to succession theory, changes take place over time not only in species composition but also in biotic, soil, climatic, productivity, dominance and diversity characteristics, presumably as an effect of floristic modification. Often these theories are tested by intensive sampling of a very small number of fields in age series. This study looked at some of the same measures in a relatively large sample. Thirty old fields in Conesus Lake watershed were sampled for species composition, soil pH and organic matter content. All fields had limey soils and good agricultural potential. Age since abandonment varied from 1-25+ years. In all, 112 species were found including 31 Composites, 9 grasses and 16 woody species. Species composition was measured by recording presence or absence in each of 25 randomly placed meter-square quadrats. Factor analysis (PL 1) was used to extract clusters of species. Four field types accounted for 22 of the fields: "Canada goldenrod fields" (11 fields); "Timothy-Quack fields" (3); "young fields" (5); "Bromegrass fields" (3).

Young fields, all one year from cultivation, showed little interrelatedness indicating that there is no unique group of species that will take over in the first year since abandonment. Almost all Canada goldenrod fields had a history of having been plowed and planted to non-hay crops; ages ranged 5-25+ years. Timothy-Quack and Brome fields were in the 2-15 year range, and all had a history of having been hay fields. High species richness was characteristic of three fields which had been burnt or grazed. Geographic proximity of fields was not as good a predictor of species associations as history, except where neighboring fields were treated identically. In fields more than 4 years since abandonment, no relation was found between increase in age and changes in species richness, or woody species. History was therefore the only major determinant that correlated highly with species composition.

Concurrent Session No. 5
E. Hays, presiding

EFFECTS OF DIETARY FIBER ON 1, 2-DIMETHYLHYDRAZINE (DMH) INDUCED LARGE BOWEL TUMOR-INGENESIS IN RATS. D.S. Barnes, N.K. Clapp, D.A. Scott, D.L. Oberst, and S.G. Berry, Roberts Wesleyan College, Rochester, NY. 14624 Biology Division, Oak Ridge National Laboratory, Oak Ridge, TN 37830, and University of Rochester Medical Center, Rochester, NY 14620.

To determine the effects of wheat bran given before and after intestinal tumor initiation, 4 week old Fisher-344 rats were place on 20% bran synthetic diets for life. They received 2 sc DMH injections (150mg/kg BW) at 8 and 10 wks of age. Groups included: DMH control (c), wheat bran (w) and two groups, delayed wheat I (DWI) and delayed wheat II (DWII) were given the control (no bran) diet and then, at 4 and 18 weeks respectively after the second DMH dose, the wheat bran diet. Rats were killed 9 mos after the first DMH dose. Likewise to determine the effects fo various dietary brans, three other groups corn (CO), rice (R), and soybean (S), received 20% bran at age 4 wks and same DMH dose. Large intestine tumor incidences were: C 93%, DWII and S 84%, CO 100%, DWI 62%, R 86%, and W 75%. All DMH groups had 2 tumors/tumor-pos rat except CO (4). Apparently wheat bran may decrease and corn bran increase the promotion (expression) state of colon tumorigenesis; wheat bran may be of greatest value when eaten before or soon after tumor initiation but has little effect if easten long after.

EFFECT OF PROPYLTHIOURACIL TREATMENT ON THE UTERINE RESPONSE TO OXYTOCIN. S. Blake and R. Gardner, Dept. of Biology, Rochester Institute of Technology, Rochester, New York.

These studies were initiated to examine the effect of hypothyroidism on oxytocin-induced contractions on isolated rat uteri. The uterine response to oxytocin (1 unit/ml) was studied by comparing the effects of oxytocin in ovariectomized rats fed either a normal diet (euthyroid controls) or a diet containing 0.15% propylthiouracil (PTU; hypothyroid induced) for 30 days. Since reports show that the uterine response to oxytocin can be modified by estradiol (E_2) pre-treatment, animals from control and PTU treated groups were injected with saline (0.9%) or E_2 (5μg) 48 hours prior to sacrifice. Following sacrifice, uteri were removed and one horn of the uterus was placed in an isolated organ bath containing van Dyke-Hastings buffer solution, pH 7.4, and motility was monitored and recorded by a force transducer-physiograph system. Oxytocin-induced contractions were observed in hypothyroid and euthytoid rats that were pre-treated with saline or E_2. E_2 pre-treatment significantly enhanced the uterine response to oxytocin. The magnitude (gm tension) of oxytocin-induced contractions in saline and E_2 pre-treated rats was significantly reduced in hypothyroid as compared to euthyroid rats. This study suggests that thyroid hormones are important for normal uterine function.

HEMATOCRITS AND PLASMA TESTOSTERONE LEVELS IN THE EASTERN CHIPMUNK (TAMIAS STRIATUS). Gloria M. D'Agostino, Lorraine E. Giovinazzo, and I.M. Scott, Biology Dept., St. Bonaventure Univ., St. Bonaventure, New York.

Seasonal plasma testosterone levels were measured in the eastern chipmunk to determine whether hibernation occurred during high gonadal activity. Hematocrits were also measured to see if there was a relationship between blood fluids and hibernating temperatures. Forty-four chipmunks were sampled retro-orbitally between October 1978 and June 1979. Hibernation bouts were determined by visual observation and body temperature measurements. The room temperature varied between 4°C and 26°C. Chipmunks were given ad

libitum food and water. Testosterone was measured by radioimmuno assay. The April samples from hibernating males and from males with gonadal enlargements were not significantly increased. Significant elevation in testosterone occurred in May when gonads of all males were enlarged and the animals had ceased hibernation by at least 3 weeks. The June measurements from males with enlarged gonads were not significantly higher than winter values. Females testosterone values averaged 26± 15 ng/ml with no seasonal variation. The results showed significantly higher testosterone after the chipmunks ceased hibernation and gonads enlarged. Results of the hematocrit measurements indicate significant inverse relationship between the hematocrit and body temperature in the chipmunks that actually entered hibernation.

THE EFFECTS OF WHOLE BODY RADIATION ON ESTROGEN-STIMULATED UTERINE GROWTH. J. Douthwright-Fasse, R. Gardner, Dept. Biology, Rochester Institute of Technology.

This study was initiated to examine the effect of whole-body radiation on estradiol-stimulated uterine growth. Rats were ovariectomized prior to treatment. Animals were radiated with 500 rads; 48 and 24 hours prior to sacrifice, and rats from each treatment group were injected with 0.9% saline or 5μg estradiol. The rats were sacrificed 24 hours after these injections. Uteri were removed and the growth response to estradiol was determined by measuring wet weights. Uterine wet weights in saline treated rats were not significantly different in rats exposed to radiation 48 hours earlier as compared to non-radiated saline controls. In contrast, saline treated rats that were exposed to radiation 24 hours prior to sacrifice were significantly different than saline treated non-radiated controls. Uterine wet weight levels in estradiol treated rats were significantly greater in all the radiation-treatment groups as compared to each group's saline control. The magnitude of estradiol-stimulated uterine growth response was significantly depressed in animals exposed to radiation 24 hours prior to sacrifice. These results suggest that estrogen-stimulated uterine growth responses may serve as an in vivo model to study radiation effects on normal growth and development.

CAFFEINCE DOSE-DEPENDENCE OF TENSION DEVELOPMENT IN RAT SOLEUS MUSCLE. M.J. Hammack, L.M. Ugol and R.J. Connett, Physiology Dept., Univ. Rochester, Rochester, New York 14642.

Previous studies have shown that in frog sartorius muscle caffeine in the range of 0.5-2.0 mM causes an increase in the tension of an electrically stimulated twitch. Higher doses of caffeine results in tension development without electrical stimulation - a caffeine contracture. The studies reported here were undertaken to see if this same phenomenon occurred in a mammalian muscle.

Tension development of soleus muscles, a slow-twitch, oxidative striated muscle, isolated from young rats, was measured using a Beckman tension transducer and recorder. The muscles were incubated at 37°C in a modified Earles solution containing 4 mM glucose and 1 mg/dl tubocurarine chloride and gassed with 95% O_2-5% CO_2. Addition of caffeince to this solution provided test concentrations ranging from 0.5 mM to 50 mM. Muscles were set a 1 g. initial tension and stimulated to twitch electrically. Twitch, tetanic and caffeinge-induced tensions were measured using the same muscle. Two major results were obtained. Maximum twitch tension occurred at 2.5 mM caffeine, above which the tension decreased. Furthermore, non-stimulated muscles demonstrated a caffeine dose-dependence contracture, with maximum contracture occurring at about 35 mM caffeine. This dose-dependent effect was reversible, unlike that seen in frog sartorius muscle.

(This work was supported in part by a grant-in-aid from MDAA and NIH Grant #AM 22124.)

CAFEINE ACTION ON HIGH ENERGY PHOSPHATE STORES IN RAT SOLEUS MUSCLE. E.T. Hays and R.J. Connett, Dept. of Biology, Nazareth College of Rochester, Rochester, N.Y., and Dept. of Physiology, University of Rochester, Rochester, N.Y.

Hays and Connett (Biochem. Pharm. 27:2965-2968, 1978) suggested that in isolated frog skeletal muscle, caffeine produces a significant imbalance between energy production and energy utilization. This imbalance is observed when frog sartorius muscles are exposed to levels of caffeine that are subthreshold as well as suprathreshold for contracture. Experiments were conducted to determine if caffeine would cause a similar imbalance in mammalian muscle. Paired soleus muscles were isolated from young male rats. For recovery following dissection, the muscles were incubated at 37°C in an oxygenated modified Earles solution buffered with phosphate and Tris at pH 7.4 for one hour. Both glucose (4mM) and curare (9 mg/L) were present in the recovery solutions as well as in all other solutions. The muscles were transferred to experimental (caffeine added) or control solutions (no caffeine added) for one hour. The muscles were removed from the solutions, quickly frozen with liquid nitrogen, weighed and homogenized in a 6% perchloric acid solution. After centrifugation and neutralization, samples of the supernatant were assayed for creatine phosphate (CrP), ATP, Glucose-6-phosphate, and free creatine. Caffeine concentrations between 1 and 20 mM were used and the muscle contents of high energy phosphate compounds (CrP and ATP) were compared in paired muscles with and without caffeine. Whereas 1 mM caffeine has no significant effect on CrP and ATP contents, significant reductions in both CrP and ATP were observed with doses of caffeine of 2.5 mM and greater. Our results show that, like in frog muscles, caffeine stimulates energy turnover. Rat muscle however has the metabolic capacity to maintain energy stroes at a new but lower steady-state.

(Supported by grant-in-aid from MDAA)

TENSION AS THE BASIS OF UMBILICAL CORD GROWTH. Marvin Miller, Marilyn Higginbottom, David Smith, University of Rochester School of Medicine, University of Washington.

An intriguing question in embryology is what factor(s) determine umbilical cord growth in placental mammals. We retrospectively examined human newborns with short umbilical cords to see if there was any common factors that might suggest an answer to this question. Short umbilical cords were found in two groups of newborns -- those reared in constrained, intrauterine environments and those with limb dysfunction. The results are shown below:

Category	Number	Cord Length (cm)		
		Mean	SD	Range
1. Early constraint (first trimester)	13	11	6	5-24
2. Later constraint (after first trimester)	5	32	9	20-43
3. Limb dysfunction	16	14	12	1-40
4. Normals*	538	61	10	30-129

As noted in the table, the earlier in gestation the constraint, the shorter the umbilical cord. These findings suggest that linear umbilical cord growth occurs in response to tensile forces placed on the cord by movement of the fetus. Any situation that restricts fetal movement, such as diminished space availability or an intrinsic problem in the ability of the fetus to move, will produce a short umbilical cord.

Experimental animal studies are in accord with this hypothesis. Experimentally produced constraint by amnion sac puncture in rat fetuses at 14-16 days gestation results in shorter umbilical cords in these offspring than in controls when examined at term (21 days). Rat fetuses that are paralyzed at the 18th day of gestation show umbilical cord lengths that are only 85% of control fetuses at term.

*Malpas, P. Length of the human umbilical cord at term. Br. Med. J. 1:673, 1964.

Concurrent Session No. 6
R. Benson, presiding

JOHN SAMUEL BUDGETT (1872-1904); NATURALIST/EMBRYOLOGIST: IN SEARCH OF LUNGFISH AND POLYPTERUS EGGS. E.B. Conant, Dept. of Biology, SUNY Buffalo, Buffalo, N.Y.

Budgett, a young British zoologist known for his gentleness and his extraordinary gifts as preparator/technician, made five trips to two continents to study the early stages of primitive fishes. In 1896, he accompanied John Graham Kerr to the Gran Chaco of Paraguay to investigate Lepidosiren development. Within seven months, the two men had located the fish, followed its breeding behavior and its embryology, and returned to England with a complete set of preserved material. In 1898, 1900, 1902, and 1903, Budgett mounted solo expeditions to Gambia, Uganda, and Niger in pursuit of the eggs of Polypterus and Protopterus.

Biographical descriptions of him and his own diaries portray him as an eager, conscientious young man of great modesty combined with inventiveness and a surprising single-mindedness. He continually experimented with preserving and staining reagents and devised a new tropical aquarium, a new way to visualize serial sections and some refinements of the standard microtome. On his trips, he met the vicissitudes of weather and discomfort and bad timing with true Victorian equanimity. He was apparently trusted by all manner of men, from fellow zoologists to native bearers and village chiefs. His diaries include observations of natural history, anthropology and meteorology as well as more specific references to fish and amphibian species. There are delightful passages in which he describes riding his bicycle over African trails and using it to divert attention away from potential conflicts. He was much interested in anuran amphibians and documented the behavior, calls and morphology of a number of South American and African frogs. Back in England, he contributed to the training of prospective British soldiers during the Boer War, but he was never far from his ambition to clarify the developmental stages in those fish of especial evolutionary importance.

Weakened by malaria and blackwater fever, he died five months after his return from his successful last trip to Niger. He was only 32.

COMPLEXES OF MERCAPTOETHYLAMINE-N,S-DIACETATE. T.A. Donovan and Steven M. Ortel, Dept. of Chemistry, Buffalo State College.

The technique of "template synthesis" was employed to prepare the first coordination compounds incorporating an open-chain quadridentate ligand which utilizes three different types of donor atom. Condensation of cysteamine-N-acetic acid ($HSCH_2CH_2NHCH_2COOH$) with chloroacetic acid ($ClCH_2COOH$) in an alkaline environment in the presence of appropriate metal ions produced neutral tetracoordinate complexes of mercaptoethylamine-N,S-diacetate ($OOCCH_2SCH_2CH_2NHCH_2COO$) with Mn(II), Fe(II), Co(II), Ni(II), Cu(II), and Zn(II). These complexes were characterized by elemental analysis and by measurement and interpretation of their ultraviolet, visible, and infrared spectra. Magnetic moment determinations were also made for some of the complexes.

USE OF COMPUTERS IN UNDERGRADUATE RESEARCH. Bhairav D. Joshi, Dept. of Chemistry, SUNY Geneseo, Geneseo, N.Y.

Undergraduate students are encouraged to participate in a variety of research projects involving the use of computers for carrying out the necessary calculations. Students are also encouraged to participate in faculty research projects dealing with the development of algorithms and computer programs for use in a variety of college level courses. For student involvement basic emphasis is placed on: (1) learning to use available computer programs for carrying out desired calculations, (2) learning the qualitative interpretations of the computer data as it relates to chemical concepts under investigation, and (3) an indepth study (analytical and numerical) of a problem of interest to student, and its solution using a computer under close faculty supervision. A number of students have benefited from such progjects at Geneseo.

DISTANCE TEACHING OF ELECTRICAL SCIENCE. Angelo Lamendola.

This paper describes a viable solution to teaching electrical science to the student in an external/internal degree program. The present study directs attention to the problem of teaching and learning materials development of the laboratory portion of the tutorials (course) as well as careful choice of subject matter for the tutorial session. A spin-off of this study has been the investigation of suitable teaching-learning materials for tutorials in electronic science applied to musical engineering. Vehicle for this mode of instruction is an adaptation of the Keller plan for individualized instruction to an amalgamation of the Empire State College, SUNY tutorials method with tutorial technique presently employed at the Universities of Oxford and Cambridge, England.

USE OF MINIATURE SWINE IN DENTAL RESEARCH. J.P. Rausch, E.A. Monroe, Alfred University, NYS College of Ceramics.

Hormel S-1 miniature swine were obtained from a commercial supplier. They were housed in a common pen on concrete with water ad lib while limited feeding of twice daily rations were provided. The pigs selected fro implantation were isolated, fasted for 24 hours prior to general anesthesia. Pre-op, post-op, and monthly impressions, X-rays and photographs were taken. The problems encountered were minimal reinforceing the rationale of using a miniature pig for biologically related research.

ALVEOLAR RIDGE RESTORATION USING A COMPOSITE CERAMIC-POLYMER BONE CEMENT. J.P. Rausch, E.A. Monroe, J.P. Cushing, Alfred University, NYS College of Ceramics, and Strong Memorial Hospital.

Preliminary tests as to the efficacy of using a ceramic-plastic bone cement to rebuild the alveolar ridge following tooth loss were undertaken. Following general anesthesia, the local area was infiltrated with 2% Lidocaine solution w/1:100,000 EPI for bleeding control. The jaw bone sites were then exposed by a

direct surgical approach. The soft tissue and periosteum were reflected away from the jaw bone at the M_1 molar site. Using a round series 510 #8 carbide burr in a dental hand piece under saline coolant, a 10 mm x 8 mm cavity was produced. The experimental bone cement was placed in this cavity, packed and permitted to polymerize prior to closing. Both the palatal flap and the soft tissue over the lower jaw site were closed using independent sutures. Healing was good with no sign of inflammation or infection. Radiographs, photographs and histological data suggest good tolerance to the implant.

A UNIQUE PREPARATION OF LARGE MULTIDENSITY SAMPLES FOR HISTOLOGICAL EXAMINATION. J.P. Rausch, J.P. Cushing, Alfred University, Strong Memorial Hospital, Rochester.

The purpose of this study was to characterize and evaluate the tissures which were in direct contact with implanted material. This will give an indication as to the biocompatibility of the experimental material. The differences in the densities of ceramic, plastic, bone and soft tissue samples necessitated the utilization of unique histological techniques. These procedures permitted routine examination of the tissue implant interface.

A COMPOSITE CERAMIC-POLYMER MATERIAL USED FOR ALVEOLAR BONE PRESERVATION. J.P. Rausch, E.A. Monroe, S. Natarjan, Alfred University, NYS College of Ceramics.

The present study was undertaken to test the efficacy of a composite bone cement in preserving the tooth-deficient alveolar ridge of miniature swine. The implant material was composed of 65 wt % polymethylmethacrylate powder and 35 wt % Al_2O_3 powder and is currently under study in our lab as an orthopedic bone cement. Upon mixing with an acrylic monomer, the powders polymerize into a hard composite solid. The improved characteristics of peak temperature, strength, wetability, as well as the success of the implanted samples, all suggest a bone-cement that is better all around than those presently in use.

EXHIBIT

CHARLES E. RIDER, M.D. (1839-1909), ASSOCIATE OF DR. SAMUEL A. LATTIMORE (1828-1913) IN FOUNDING OF THE MICROSCOPICAL SOCIETY (1879-1881) AND THE ROCHESTER ACADEMY OF SCIENCE (1881). Lawrence J. King, Biology Dept., SUNY Geneseo, Geneseo, N.Y.

A report to the Academy in 1978 outlined the early history of these organizations and the role of Dr. Lattimore. Apparently Dr. Rider suggested the Society, and the first conference meeting was held in Dr. Lattimore's chemistry lecture room in Anderson Hall, University of Rochester. The first meeting of organization was held in Dr. Rider's Rochester Office on Jan. 13, 1879, with the former serving as the Treasurer and Dr. Lattimore the President. While these early records are lost, fortunately rather full and regular accounts of meetings were published in the Rochester Daily Union and Advertiser. The first account (Feb. 11, 1879) states that there were 30 working members.

Dr. Rider was distinguished as an expert in the diseases and treatment of the eye. He was born in New Haven, Vermont on Nov. 26, 1839. He was tutored by a neighboring clergyman and became quite proficient in Latin and Greek and later in modern languages. His formal education was at Oberlin and Middlebury Colleges. After his graduation from the latter school, he traveled to Europe, where he was enrolled in courses at the University of Giessen in Germany (1861), and the School of Medicine in Paris (1862). He returned to the University of Vermont Medical School - where in 1863 he rereceived his medical degree. In 1866 he received the M.A. degree from the University of Rochester.

Charles E. Rider was the first resident physician in the Rochester City Hospital, and was professor of ophthalmology and diseases of the ear at the Geneva Medical College (1880-1886). He helped to organize a number of societies, and was a member (and first organizer) of the Spencer Club, and a member of the Fortnightly Club. His early scholarly training, his scientific studies, and his world travel all provided the basis for an enthusiastic interest and support of science and learning. One biographer noted: "He was as anxious to disseminate knowledge as to acquire it; indeed, he was a constant teacher and an unfailing source of information to young men." His son, Wheelock Rider M.D. (1863-1917), was a well known Rochester physician. Charles Rider died at Chappaqua, N.Y. on Jan. 31, 1909.

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