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ABSTRACTS OF PAPERS

THIRD ANNUAL SCIENTIFIC PAPER SESSION

ST. JOHN FISHER COLLEGE, ROCHESTER, NEW YORK

OCTOBER 30, 1976

FOURTH ANNUAL SCIENTIFIC PAPER SESSION

MONROE COMMUNITY COLLEGE, ROCHESTER, NEW YORK

NOVEMBER 5, 1977

FIFTH ANNUAL SCIENTIFIC PAPER SESSION

STATE UNIVERSITY OF NEW YORK
COLLEGE AT GENESEO, NEW YORK

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ROCHESTER ACADEMY OF SCIENCE

THIRD ANNUAL SCIENTIFIC PAPER SESSION

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CHAIRMAN: DR. MELVIN J. WENTLAND

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Concurrent Session No. 1 - Geology and Environmental Studies
S. R. Gawlik, presiding

AN ENERGY BUDGET FOR THE NEW YORK STATE BARGE CANAL. A. R. Amering and J. C. Makarewicz, Department of Biology, State University College, Brockport, New York

A monthly energy budget is presented for a section of the New York State Barge Canal. This section of the canal has man-made earthen banks. All input and output fluxes of potential energy as organic matter are considered to describe the dynamics of energy flow in a 1,130-m segment of the canal during the month of July. The monthly input of energy to the system is 9,768,203 kcal/m^2. Over 99% of this is allochthonous, mostly as dissolved organic matter (75.4%) and fine particulate organic matter (24.5%). Meteorologic inputs (litter, wind blown, and rainfall) accounted for less than one tenth of one percent of total input of energy. Primary production, an autochthonous input, was estimated at 453.4 kcal/m^2/month, a value less than one percent of the total energy input. Ninety-nine percent of the annual energy input is exported to downstream areas. This energy budget indicates community metabolism is low.

THE CULTURE OF CANADIAN WATERWEED (ELODEA CANADENSIS MICHX.) AND ITS RESPONSES TO INTRODUCED FUNGI. Peter A. Crichton, Rochester Institute of Technology College of Continuing Education, Rochester, N.Y. and Lawrence J. King, Department of Biology, State University College, Geneseo, N.Y.

Canadian waterweed (Elodea canadensis Michx) was cultured in a growth chamber in a tap-water medium using high plant population densities and low light intensities. A cycle of fourteen hours of light at a temperature of 18°C. was used. Cultures were started with initial populations of approximately 0.56 cm stem sections of plant material per milliliter of medium Approximately 1,000 f.c. of both fluorescent and incandescant illumination were utilized with reduced lighting provided by layers of cheesecloth. This low light intensity, while sufficient for Elodea growth, resulted in the growth suppression of algal populations which interfered seriously with the Elodea cultures.

Early December winter-bud stages of Elodea were also used successfully as test culture propagules. These provided more vigorous growth than cut segments from the summer growth phases.

Fungi collected from local aquatic habitats as well as from a number of terrestrial habitats were tested. Except for Rhizoctonia solani Kuhn, none of these had any profound effect on the growth of Elodea. The 50% reduction in Elodea growth in the presence of R. solani may have resulted from toxins secreted by the fungus, as no direct parasitic activity was observed.

This research comprises a M.A. thesis, "The Growth Chamber Culture of Elodea canadensis Michx. and the Plant's Responses to a Series of Introduced Fungi as a Basis for Biological Control." P. A. Crichton, State University College of Arts and Science, Geneseo, N.Y. May 4, 1976, 94 pp. 13 plates.

GEOLOGY AND THE ERIE CANAL. R. Gullo, St. John Fisher College, Rochester, New York

The Erie Canal, completed in 1825, provided a gateway through Western New York and initiated the westward movement to the Great Lakes for the purpose of exploration, trade, and eventual settlement. The geological past of building, destroying, and rebuilding again provided the key decision to build the canal through New York State.

According to geologists, the land movement of the State is constantly building, changing, weathering, and rebuilding. Lakes at one time were large valleys; rivers which flowed in one direction now changed course. These changes of shifting lands provided a fertile soil as well as waterpower. The key geological change in land topography was the opening of a path through the Appalachian chain of mountains.

The many creeks, streams, and outlets were able to satisfy the water demands. Locks were used to make up the differences in land elevation between Albany and Buffalo. These, and many other factors, helped bring about the building of the Erie Canal.

AN EVALUATION OF THE HERBICIDE 2,4-D AS A CONTROL AGENT OF MACROBENTHIC WEEDS IN CAYUGA LAKE. G. Miller, Division of Science and Mathematics, Eisenhower College, Seneca Falls, New York.

In May 1975, 90 acres of weed infested water on the northwest side of Cayuga Lake (largest of the Finger Lakes) were treated with 8400 lbs. of the herbicide 2,4-D (granular aquakleen). The biological impact of the herbicide application was determined by measuring changes in species density, frequency, diversity and biomass in the treated zones. These data were compared to control zones in non-treated areas of Cayuga Lake to determine the percentage of change. Biological sampling has been continuous at monthly intervals since May 1975, except when the lake was ice covered. Initially a population reduction of 98% of the main macrobenthic weed Myriophyllum spicatum L. (Haloragaceae) occurred within one month. Changes in the plant species in the initial post-application phase and the 1976 successional sequence will be presented.

GERMINATION INHIBITION OF THREE OLD-FIELD SPECIES BY EXTRACTS OF CANADIAN GOLDENROD. Archibald Reid and Sharon Iresabel, Biology Department, State University College, Geneseo, N.Y.

Water extracts from the leaves of Canadian goldenrod (Solidago canadensis) were used in germination tests of three species common to disturbed sites and old-fields of western New York. The species used were dandelion (Taraxacum officinale), wild carrot (Daucus carota), and common field milkweed (Asclepias syriaca). Two concentrations of the extract were used and significant results were obtained in most trials, indicating the strong possibility of allelopathic activity by the goldenrod extract. Applicability to field situations has yet to be determined.

GLACIAL AND POSTGLACIAL SEDIMENTARY ENVIRONMENTS IN THE GENESEE VALLEY. L. P. Smith and R. A. Young, Department of Geological Sciences, State University College, Geneseo, New York.

X-ray, optical, and textural analyses of Pleistocene and recent sediments in the Genesee Valley were undertaken as a part of a general mapping project and to resolve specific controversies concerning the environmental setting of archaeological sites. A wide range of known environments including sand dunes, glacial tills, beaches, floodplains and deltas were examined, along with samples not readily identifiable in the field. Mineralogically, all the silts and clays showed an unanticipated uniformity, independent of depositional environment. X-ray analyses demonstrate that quartz forms the bulk of fine sediment well into the clay size range with minor amounts of illite, kaolinite, and calcite commonly present.

Major environmental differences are readily apparent in the textural analyses, but considerable overlap may exist between alluvial and lacustrine samples.

One important objective was to distinguish whether a lacustrine, fluvial, or eolian origin best explains the characteristics of archaeologically significant deposits 50 to 90 feet above the river bed near the mouth of Canaseraga Creek. All available geologic evidence suggests that sedimentary size analyses must be carefully interpreted in light of local variations in course materials and unique geologic settings.

THE EFFECT OF PHOTOPERIOD ON THE SEED DORMANCY OF CHENOPODIUM ALBUM L. Melvin J. Wentland, Biology Department, St. John Fisher College, Rochester, New York

Chenopodium album plants were grown in growth chambers in 8 (short days) and 17 hour (long days) photoperiods. A high percentage of dormant seeds was produced in long days and a low percentage was produced in short days. The plants producing dormant seeds were taller, produced a greater number of seeds and a greater amount of dry weight than plants grown in short days. The dormant seeds were smaller than the non-dormant seeds but possessed thicker seed coats. Photoperiod rather than total light energy influences the production of dormant seeds. The effect of photoperiod on seed dormancy is not restricted to the period of seed development and maturation but has an effect throughout the life of the plant. Inhibitors found in several extracts of the embryo-endosperm complex of dormant seeds were effective in a root growth bioassay of Lepidium sativum and Chenopodium album. In chromatographic studies of the inhibitors of dormant seeds, five inhibitory substances were separated and were more inhibitory to root growth than the material from non-dormant seeds.

REVISIONS IN THE LATE GLACIAL HISTORY OF THE GENESEE VALLEY. R. A. Young, Department of Geological Sciences, State University College, Geneseo, N.Y.

Continuing field studies in the Genesee Valley have demonstrated the existence of two glacial readvances terminating close to Geneseo, N.Y. The older, more massive till unit rests on varved sediments and covers an older valley at least 300 feet deep. Above the lower till near the latitude of Salt Creek, a thinner, younger till caps varved clays which exhibit obvious ice deformation structures. The younger till contains fewer clasts and is interpreted to have been formed by a second short readvance over distinctive clay varves that show considerable variation in the thickness of individual laminae. Although the youngest readvance may represent only a minor fluctuation of the ice front, a relatively thick sequence of varves is present as compared with other sections in the same region.

This complex valley fill also appears to include small isolated pods of deformed till and varved sediments beneath a thin cover of floodplain silts. The subtle stratigraphic complexities are difficult to map in detail but the general field relations are well exposed.

The location of the ice front in this position for some time correlates with the prominent meltwater outlet channel draining west from the Genesee Valley at an elevation near 1000 feet through Pearl Creek into the Wyoming Valley. H. L. Fairchild seems to have considered this outlet unimportant as he does not discuss it specifically or locate it on his maps when he outlines the stages in the Genesee Valley proglacial lake levels. He seems to have considered the slightly lower channels 7 to 8 miles further north on the LeRoy and Stafford Quadrangles as being the major drainage outlets along the ice front.

Evidence that the Pearl Creek outlet marks a significant lake stage is corroborated by mapping near Dansville, which demonstrates that significant delta sands and gravels occur only at or below the 1000-foot level. These modifications do not significantly change the overall history of the valley but add details which may aid in a more complete understanding of the complexities of the last glacial retreat.

Portions of these studies were supported by funds made available by the Geneseo Foundation, the New York State Geological Survey, and the U.S. Geological Survey as part of the IJC activities funded by the U.S. Environmental Protection Agency and the State of New York.

Concurrent Session No. 2 - Physiology and Development Studies
R. Machemer, Jr., presiding

BRANCHING PATTERN IN CONOCEPHALUM CONICUM (L.) DUMORT. J. P. Barayasarra and A. F. Finocchio, Medical Services Department, SUNY Agricultural and Technical College, Alfred, New York and Department of Biology, St. Bonaventure University, St. Bonaventure, New York.

Field and laboratory studies of the liverwort C. conicum from several sites in western New York indicate asymmetric dichotomous branching. Analysis of 100 cm^2 mats from male and female clones demonstrate the following differences: Maximum number of dichotomous branching of individual male plants ranged from zero to six with a mean maximum number of 3.7. The number of apices resulting from an overwintering apex from the previous year ranged from one (no branching at all) to 18 with a mean of 6.55.

Maximum number of dichotomous branching of individual female plants ranged from zero to five with a mean maximum of 2.56. The number of apices resulting from an overwintering female apex ranged from one to eight with a mean of 3.86. Antheridiophores and archegoniophores are formed from apices on the minor dichotomous branches. These findings for C. conicum from the western New York area differ from earlier reports for C. conicum from the London area.

COMPARATIVE ULTRA-STRUCTURE STUDY OF THREE SPECIES OF RAPHIDIOPHRYS (PROTOZOA: HELIOZOA). Donald Drake and Edward Ritter, Department of Biology, State University College, Geneseo, New York.

A study of the ultrastructure of three freshwater species of the protozoan genus Raphidiophrys (R. intermedia, R. pallida and R. elegans) showed a common body pattern of zonation of organelle systems. The pattern involved a radial series of layers, each layer containing characteristic, functionally related organelles and generally excluding others. These layers have been labeled from the center of the cell outward: the centroplast zone, the zone of exclusion, the Golgi ring, the rough endoplasmic reticulum zone, the ectoplasm and the exterior zone. A similar pattern has been observed by Bardele (1975) in the marine heliozoan, Heterophrys marina.

The centroplast zone contains a central granule and a dense ring of material into which the axonenes insert. The function of this zone appears to be axoneme nucleation and perhaps structure formation. The zone of exclusion contains almost no organelles and may represent a buffer zone. The Golgi ring is at the interior border of the RER zone and presumably packages products produced by this zone. Besides protein anabolism, the RER zone appears to be the site of kinetocyst and spicule formation. The zone also contains mitochondria and an eccentric nucleus. The ectoplasm is the site of prey digestion and evacuation. The exterior zone contains a mucous coat that holds the mature spicules in place as well as the extended axopods and islands of cytoplasm.

The compartmentalization is extreme in certain zones of R. intermedia and R. pallida. The centroplast and zone of exclusion are nearly totally isolated from the rest of the cell body, being connected only by 'bridges' formed by axonemes. Furthermore, in R. intermedia and R. pallida, the RER zone is divided into wedges which are separated from each other by vacuoles. The nucleus is separated from these wedges and is only connected by thin cytoplasmic bridges.

R. elegans shows none of this packaged compartmentalization; the various zones show a radially continuous gradation and the cytoplasm is not divided. In this particular aspect, it more closely resembles Heterophrys glabrescens.

INFLUENCE OF DIFFERENT SERA ON THE IN VITRO DEVELOPMENT OF POST-BLASTOCYST MOUSE EMBRYOS. J. A. DuBois and R. J. Wordinger, Department of Biology, St. Bonaventure College, St. Bonaventure, New York.

The objective of this study was to observe the effects of different serum supplemented media on the in vitro development of post-blastocyst mouse embryos. Blastocysts were collected from superovulated female Swiss mice 82 hours postovulation. Earle's modification of Basal Medium (Eagle) BME was supplemented with 20% fetal calf serum (FCS) and 20% human cord serum (HCS) obtained from the umbillical cord of human amle and female fetuses at birth. Two lots, each, of male and female human cord serum were prepared by pooling the samples obtained from male and female fetuses at birth. Each lot contained a minimum of 50 cc of pooled sera. The embryos were cultured in 35 x 10 mm plastic petri dishes utilizing the embryo culture system developed by Brinster (1968). The following media were utilized to evaluate hatching, attachment, trophoblast cell outgrowth and differentiation of post-blastocyst embryos: (1) 20% FCS + BME, (2) female HCS + BME, (3) 20% male HCS + BME. An initial experiment determined that a reconstituted, neutralized rat-tail collagen substratum provided optimum embryonic growth. Based on these results this was the system utilized in the remaining experiments. The two lots of each serum type were examined for embryonic growth.

The values for hatching, attachment, trophoblast cell outgrowth, and differentiation with respect to lot # 1 of the sera are: hatching: 71% (195/275), 90% (254/283), 65% (184/283), 68% (192/283); attachment: 75% (146/195), 80% (204/254), 65% (119/184), 68% (130/192; trophoblast cell outgrowth: 28% (40/146), 74% (150/204), 40% (47/119), 45% (58/130); differentiation: 1.5% (6/40), 47% (71/150), 28% (13/47), 31% (18/58). The values for hatching, attachment, trophoblast cell outgrowth, and differentiation with respect to lot # 2 of the sera are: hatching: 51% (193/376), 77% (288/376), 62% (222/259), 65% (225/348); attachment: 80% (154/193), 92% (264/288), 82% (193/222), 84% (189/225); trophoblast cell outgrowth: 80% (123/154), 88% (231/264), 82% (150/183), 83% (156/189); differentiation: 20% (24/123), 62% (143/231), 47% (71/150), 54% (85/156). Comparison of the data from these two experiments indicate a high degree of variability between serum lots and that female human cord serum is superior to fetal calf serum and male human cord serum for in vitro post-blastocyst embryonic development.

STRUCTURE AND FUNCTION OF STIGMATOID CELLS IN THE DEVELOPING PISTIL OF LILIUM LEUCANTHUM. Stanley R. Gawlik, Biology Department, St. John Fisher College, Rochester, New York.

Lining the stylar canal of lily pistils are stigmatoid cells which contain a secretory zone consisting of a labyrinth of wall ingrowths. The pattern of secretory zone development is basipetal and associated with the initiation of chemotropism.

In a mature pistil large crystals, sensitive to protease, can be observed in the cytoplasm of stigmatoid cells. These crystals also follow a basipetal pattern of development. At anthesis degradation of the crystal commences and progresses basipetally as the pistil ages. The role of the crystal is uncertain.

Developing pistils cultured in the presence of labeled proline take up the label. At maturity of the pistil the label is found in the crystal and the secretory zone of the stigmatoid cells. Pollen tubes growing in the canal of such a labeled pistil take up the label.

THE EFFECT OF PYRUVATE ON THE IN VITRO POST-BLASTOCYST DEVELOPMENT OF THE MOUSE. J. T. Hendryx and R. J. Wordinger, Department of Biology, St. Bonaventure University, St. Bonaventure, New York.

The in vitro energy requirements for the developing mouse embryo from the two-cell to the blastocyst stage have been well delineated (Brinster, 1965). However, there is little information available on the specific energy requirements for post-blastocyst in vitro development. Preliminary studies in our laboratory indicate an overall enhancement of post-blastocyst development when 0.25 millimolar sodium pyruvate is added to a basal tissue culture medium containing 1 mg/ml of glucose and supplemented with a 20% serum component.

The objective of this study was to determine the effect of pyruvate in combination with glucose on the in vitro development of the post-blastocyst mouse embryo.

Six to eight-week old female Swiss albino mice were superovulated by an intraperitoneal injection of 5 I.U. of PMS (pregnant mare serum gonadotropin) followed 48 hours later by 5 I.U. of HCG (human chorionic gonadotropin). The mice were then mated and blastocysts were collected by flushing of the uterine horns approximately 90 hours post-HCG injection. The embryos were then pooled and cultured on a reconstituted rat-tail collagen substrate according to the method of Hsu (1971). The experimental groups consisted of blastocysts cultured in: (1) Basal Medium-Eagle (BME) containing glucose at 1 mg/ml + 20% female human umbilical cord serum and, (2) BME containing glucose at 1 mg/ml and pyruvate at 0.25 mM + 20% female human umbilical cord serum. Beginning on the third day of in vitro culture (7 days post-HCG injection) and continuing through the seventh day (11 days post-HCG injection), the embryos were counted and scored according to

the number that had hatched from the zona pellucida, attached to the collagen substrate, showed trophoblast cell outgrowth, and showed differentiation of the inner cell mass. The amount of trophoblastic outgrowth and the diameter of the developing embryo were measured using an eyepiece micrometer.

Results from our preliminary experiments in which blastocysts were scored at the end of 120 hours in vitro are listed according to the % hatched; % attached; % with trophoblastic outgrowth, and % differentiation respectively: Group I: (130/151) = 86.1%; (125/130) = 96.2%; (113/125) = 90.4%; (67/113) = 59%. Group II: (149/153) = 97.4%; (145/149) = 97.3%; (135/145) = 93.1%; (89/135) = 65.9%. These data indicate an enhancement of embryonic growth when pyruvate is added to the culture media.

FINE STRUCTURE OF ACANTHOCYSTIS TURFACEA. Hiram Lyons and Edward Ritter, Department of Biology, State University College, Geneseo, New York.

A study of the fine structure of the protozoan, Acanthocystis turfacea indicates a less vacuolated cytoplasm than that found in actinophryds. The eccentrically placed nucleus is highly lobed and contains a prominent nucleolus. The nucleus is near the centroplast, as shown by the number of axonemes that surround and pass through the nuclear area. The microtubule structure of the axonemes is closer to that reported in Heterophrys and Raphidiophrys than that of the actinophryds. Numerous tightly curved Golgi vesicles are present between the nucleus and the congregated masses of ribosomes, with ribosomal pattern being somewhat similar to that seen in several species of Raphidiophrys. Kinetocysts, mitochondria, and spicules are distributed in the outer cytoplasmic area.

At the light microscope level many bifurcated spicules of two different lengths can be demonstrated projecting from the cytoplasm just beneath the plasma membrane.

THE EFFECTS OF SELECTED LIGHT ENVIRONMENTS ON THE SECRETORY ACTIVITY OF THE CHICK SUBCOMMISSURAL ORGAN. Richard Machener, Jr., St. John Fisher College, Rochester, New York.

The effects of wavelength of light on the morphology and secretory activity of the subcommissural organ (SCO) were studied in broiler cockerels. Birds were placed in light chambers and subjected to narrow band wavelength of green (545nm) to red (650 nm) light at equal energy levels. Cool white light, darkness, and a dehydrated group under cool white light were the other three treatments. Birds were sacrificed at several time periods in the chambers; the brains were removed and fixed for 48 hours in Bouin's solution. Six-micron, serial, sagittal and frontal sections were stained with hemotoxylin and eosin or periodic acid Schiff (PAS).

There is a distribution pattern of PAS-positive material within the SCO under different light treatments: under white light, green light, and salt-induced dehydration, more reactive material is in the apex of the cell than in the middle and more is in the middle than in the basal portion of the cell. Under red light and complete darkness the pattern is reversed. Salt-induced dehydration causes a net decrease in the amount of PAS-positive material present in the SCO. There was no change in the gross morphology of the SCO under these light treatments. These data suggest that environmental light plays a role in the functioning of the SCO in the male chick up to 12 weeks of age.

A STUDY OF THE EFFECTS OF GA AND cAMP ON d1 ALLELES OF ZEA MAYS L. Charles F. Mischke, Department of Biology, State University College, Geneseo, New York.

Two alleles of the dwarf-one locus of Zea mays were examined as to the effects of various concentrations of gibberellic acid and cyclic AMP. Seeds of each genotype were soaked and germinated in the test solutions The lengths of coleoptile and mesocotyl at 108 hours were measured. The time course of amylase enzyme extracted from coleoptile, mesocotyl, and leaves at various concentrations was made. Differences in activity are indicative of genotype and hormone concentrations.

Concurrent Session No. 3 - Environmental Studies
S. R. Gawlik, presiding

THE ROLE OF OLFACTORY COMMUNICATION IN RODENT POPULATION REGULATION. W. Hallahan, Department of Biology, Nazareth College, Rochester, New York.

Many rodent populations exhibit self-regulation of density independently of food supply and predators. Previous research has concentrated on two theoretical regulatory mechanisms, the behavioral and the physiological. Both mechanisms are initiated by an increase in aggressive contacts among individuals in the population. Proponents of the behavioral mechanism have shown that the rise in the frequency of aggressive interactions causes emigration or social change, both of which reduce the rate of population growth in the immediate area. Proponents of the physiological mechanisms have argued that the aggressive interactions induce endocrine changes which produce deficiencies in reproductive behavior and physiology.

The research described here indicates that physical contact is not necessary to elicit behavioral changes but rather that olfactory cues emanating from grouped rodents have the capacity to initiate changes in behavior without producing measurable physiological responses. In my experiments, a group of mice, housed together in an isolation booth, exhibited the predicted behavioral and physiological changes: the males formed a social hierarchy in which the subordinates displayed adrenal hypertrophy. When the odors of this group were piped to isolated pairs, the pairs exhibited reproductive behavior inferior to isolated pairs receiving fresh air. The males in the isolated pairs receiving the odors of the group, however, did not display any measurable adrenal hypertrophy. This research supports the theory that physiological regulation occurs only in extremely dense conditions and that for animals in the field, olfactory cues may initiate behavioral regulation as the population approaches peak density.

An additional experiment demonstrates that the subordinate males of a social hierarchy, unlike sexually active males, fail to show a preference for the odor of an estrous female over the odor of a nonestrous female. This experiment raises the possibility that adrenal hyperactivity in subordinate male mice may produce a reduction in sensory acuity.

SUBMERGED AQUATIC PLANT FLORA OF THE WESTERN FINGER LAKES REGION. Anne Kimber, Biology Department, State University College, Geneseo, New York.

The rooted aquatic vascular flora was compared for six western Finger Lakes and two bays of Lake Ontario. Collections included near-shore samplings and some inlet and outlet streams. In addition to current voucher specimens from each lake, the herbaria at Albany, Buffalo, Cornell, and Geneseo were studied to compare species composition since previous sampling. Species composition reflected the physical and man-made factors influencing each lake. Floral changes include the impoverishment of flora in Irondequoit Bay. Nevertheless, a common and persistent floral composition is indicated for the other bodies of water, and certain rare species have persisted in a protected lake (Canadice) for the past half-century.

MATING SYSTEM AND TERRITORY QUALITY IN PAINTED BUNTINGS. Scott M. Lanyon, Department of Biology, State University College, Geneseo, New York and Charles F. Thompson, Department of Biology, Illinois State University, Normal, Illinois.

The Painted Bunting (Passerina ciris) was the subject of a study on St. Catherine's Island, Georgia, during the summer of 1976. The study was designed as a test of the Orians' model which describes the conditions that lead to and the consequences of polygyny in birds.

Determination of the pair bonds of a population of banded buntings in a live oak-salt marsh ecotone showed that 47% of the males were polygynous. In addition, the Painted Bunting had all the characteristics predicted by Orians to be consequences of polygynous mating systems. Discussion will focus on preliminary evidence for differences between territories of bachelor, monogamous, and polygynous males.

USING GELATIN FILTERS FOR COLORED LIGHT INTENSITY DETERMINATIONS UNDERWATER. Bernard A. Marcus, Mathematics and Science Division, Genesee Community College, Batavia, New York.

For underwater colored light intensity determinations, recommendations in the past have been to adapt glass filters to underwater light meters. This involves the expense of purchasing the filters and perhaps having them cut to fit the light meter as well. In contrast, gelatin filters are much less expensive to purchase, are more easily cut, and are more easily adapted to light meters than glass. Previously published as: A simple and inexpensive technique for determining colored light intensity under water. Water Resources Research, 11(3):491-492, 1975.

THE CROP OF VASCULAR AQUATICS IN CONESUS LAKE. Paul Nowak, Biology Department, State University College, Geneseo, New York.

This report describes the incremental growth of the submerged rooted aquatic plants in Conesus Lake during the summer of 1976, and tentatively concludes that the crop in the northern end of the lake has been reduced since construction of a perimeter sewer in 1973. The flora included fifteen species, seven of the genus Potamogeton. Emergents were excluded from the study, but one large alga, Chara, was included. From 30 to 50 quadrants of 0.25 m^2 were collected with SCUBA gear for each sampling.

Quantitative data (fresh weight, dry weight, ash weight) were compiled to determine (1) the rate of growth, and (2) the maximum growth attained. Qualitative data were obtained to determine floral composition, and specimens preserved for herbarium record.

OAK OPENINGS IN VICTOR, ONTARIO COUNTY, NEW YORK. Seanna Rugenstein, Department of Biology, State University College, Geneseo, New York.

A field survey of plant communities in the Township of Victor, Ontario County, New York, was conducted by the author during the summer of 1975. One common plant community noted in Victor during this survey closely resembles the "oak openings" mentioned and described as present in Monroe County in the Proceedings of the Rochester Academy of Science, November 1966, by Royal E. Shanks. These Victor "oak openings" were mapped and plant inventories conducted in 1975 and 1976 by the author.

MARL BED SUCCESSION IN THE BYRON-BERGEN SWAMP. Franz K Seischab, Department of Biology, Rochester Institute of Technology, Rochester, New York.

Both Polar and Gaussian ordination of marl bed vegetation in the Byron-Bergen Swamp resulted in a physiognomic arrangement of plots. This physiognomic continuum from alga to short sedges to tall sedges and short shrubs to tall shrubs and finally to trees is correlated to a microelevational gradient. These microelevational changes are due primarily to organic matter deposition by the vegetation. Across this physiognomic gradient there were significant increases in soil cation-exchange capacity, percent organic matter and mean depth to the water table. There were also significant decreases in percent carbonate-carbon and bulk density in soils.

An analysis of soil profile morphology and tree age data suggest that the above mentioned physiognomic gradient is also a successional gradient. Succession on these marl beds begins with the invasion of a variety of sedges. Moss mats develop in the sedges. These are followed in succession by short shrubs such as Potentilla fruticosa and then by tall shrubs (Gaylussacia baccata, Myrica pensylvanica) and shrubby trees (Thuja occidentalis, Larix laricina). These trees are the beginning of a coniferous mire forest dominated by Thuja occidentalis, Pinus strobus and Acer rubrum.

STUDIES OF THE SNIPE FLIES OF WESTERN NEW YORK I. (DIPTERA: COENOMYIIDAE AND RHAGIONIDAE). Carey E. Vasey, Department of Biology, State University College, Geneseo, New York.

To date no one has thoroughly investigated the dipterous families Coenomyiidae and Rhagionidae occurring in New York State. These groups are often considered together under the common name of snipe flies due to their long legs and resemblance to birds having that name. Results of biological investigations of these flies have produced conflicting opinions with regard to their taxonomic position.

The family Coenomyiidae is often divided into two families, the Xylophagidae and the Xylomyidae. Species of both groups have an elongated third antennal segment that is subdivided into a number of annuli and both exhibit similar patterns of wing venation. However, xylomyids differ from xylophagids by having the M_3 wing cell closed and by lacking an apical spur on the foretibiae.

According to some dipteran specialists rhagionid flies are supposedly related to the coenomyiids and also are much more common. Some aspects of behaviour aid in field recognition of certain species. Structurally, rhagionids are most readily identified by having three-segmented antennae with the third segment bearing terminal or dorsal styles or aristae, a somewhat tapering abdomen, and elongated legs.

The present study was initiated in June 1976. To date four species of the Coenomyiidae have been collected from several western counties of New York. These were identified and verified as, Coenomyia ferruginae Scopoli, Xylomya tenthredinoides van der Wulp, Xylomya terminalis Vasey (n. sp.), and Solva pallipes Loew. Five species representing two genera of rhagionids have also been identified and confirmed from this region. These include Chrysopilus ornatus Say, C. proximus (Walker), C. thoracicus Fabricius, Rhagio punctapennis (Say), and R. vertebratus (Say).

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R. Machemer, Jr., presiding

EFFECTS OF ATMOSPHERIC AMMONIA ON THE LUNGS OF BABY PIGS. G. Chmielewski, J. V. Logomarsino and A. E. Barnitt, Jr., Biology Department, State University College, Geneseo, New York.

Atmospheric ammonia levels of 50ppm have been found to exist in swine rearing facilities. Unsanitary swine barns or faulty sewage systems with poor ventilation often produce this mild ammonia atmosphere. It has been suggested that this level of ammonia gas may result in respiratory disorders and reduced growth in market animals. In this experiment, six one-day-old specific pathogen free pigs were used to determine the effect of atmospheric ammonia on lung pathology. These pigs were maintained in two plexiglass 2 cubic meter environmental chambers. One chamber housed experimental animals and an atmosphere of 50ppm ammonia gas. The other chamber housed control animals with a normal atmospheric intake. After three weeks all pigs were killed by exsanguination. Lung tissue was fixed in a 10% neutral buffered formalin solution, embedded in paraffin, sectioned at 8 um and stained with hematoxylyn and eosin. Pathological evaluations of lung tissue were made by light microscopy. All animals exhibited normal lung morphology. It was concluded that an environmental atmosphere of 50ppm had no effects on the lung tissue of experimental animals. It is suggested that respiratory lesions associated with poor sanitation are the result of microbial infections.

FACTORS AFFECTING MYCELIAL LIPID PRODUCTION. John C. Clausz, Biology Department, State University College, Geneseo, New York.

A single spore isolate of the genus Achlya was grown on a variety of media, and dry weight and lipid content of the mycelial mats determined. Of the three media tested fungus growth and lipid content was greatest in Peptone-Yeast Extract-Glucose medium. When grown at 20°, 25°, and 30°C the rate of growth was highest at the higher temperature but there was no apparent difference among yields at the three temperatures in terms of mycelial dry weights and lipid content. Mycelial dry weight and lipid content are affected, however, by the concentration of media when observing cultures grown in half, full, and twice normal strength of culture media.

Thin-layer chromatographic analysis of lipids from cultures of different ages grown at different temperatures indicates that there is no dramatic change in percentages of lipids in lipid classes.

RELATIONSHIPS BETWEEN DDT INTAKE AND RATE OF ^{45}Ca INCORPORATION IN SKELETAL TISSUE OF ADULT AND EMBRYONIC MICE. Carol Lange, Biology Department, Alfred University, Alfred, New York.

This study was undertaken to determine if intake of DDT would affect calcium absorption in the skeletal tissue of embryonic and adult female mice. Radioactive ^{45}Ca was introduced into the adult females as a means of measuring differences in calcium uptake. Ten adult female mice were used. The experimental animals received 20 ppm of the pp' isomer of DDT daily, contained in six grams of standard laboratory chow. Ingestion of DDT was begun ten days before the start of the experiment. Seven animals, three control and four experimental, received 4μCi of ^{45}Ca in 0.02ml of 0.85% sterile saline. This was injected subcutaneously. On the same day each of these females was placed with a mate. Litters were born beginning 20 days after the introduction of the males with the final litter born 40 days after mates were placed in the cages. A total of 74 young were born in the seven litters. There was no appreciable difference in size or gross internal or external anatomy of the young.

Several specimens from both the control and experimental groups were cleared and subsequently stained with alizarin red dye. No visible variations in bone development or morphology were apparent using a dissecting microscope. The femur and tibia were removed from the remaining young, and the adult females, and then dried and weighed. Samples from fourteen young were used for autoradiography. A densitometer was used for an analysis of the films. These samples along with the others were then digested in 6N HCl and evaporated to dryness. Radioactive counts were done on the samples using a Geiger-Mueller tube.

There was no significant weight difference of bones in either the young or the adults. Results from the radioactive counts were uncertain. Two of the experimental litters showed twice the amount of radioactivity as the young of the control litters and as the two other experimental litters. Counts of the adults produced no significant differences. Whereas the commonly established role of DDT as a biocide is in the modification of calcium metabolism, especially in muscular and nervous tissue, the effect on calcium metabolism in skeletal tissue of adult and embryonic mice appears to be ambiguous.

LOCALIZATION OF POSSIBLE ALLERGENIC PROTEINS FROM BIRCH POLLEN. Barrett N. Rock and Carl E. Shively, Department of Biology, Alfred University, Alfred, New York.

Birch pollen is known to be a source of spring "hayfever" symptoms. The pollen of Birch (Betula papyrifera) and related species were studied in order to determine the types and sites of location of low molecular weight proteins occurring in this pollen. Several protein fractions have been extracted from the pollen and a suspected site of occurrence located through the use of the scanning electron microscope. These studies raise some interesting questions concerning the role of these proteins in the pollination process.

LIGHT AND ELECTRON MICROSCOPE STUDY OF CORALLOTAENIA MINUTIA (CESTODA, PROTEOCEPHALIDAE). C. Tallman, Mathematics/Science Division, Genesee Community College, Batavia, New York and Edward Ritter, Department of Biology, State University College, Geneseo, New York.

The morphology of the cestode Corallotaenia minutia was studied at both the light microscope and ultrastructural levels. Longitudinal and cross sections of paraffin embedded worms clearly demonstrate the presence of the sulcus in the apical region of the scolex previously reported by us from whole mounts.

The fine structure of distal and perinuclear areas of the tegument appears to be similar to that previously reported for other cestodes. The distal region contains numerous microtriches which vary in size depending upon location in the worm, and a syncital pattern of cell structure with evident electron lucid and electron dense vesicles predominates in this region. The perinuclear area of the dark cells indicates the presence of mitochondria, endoplasmic reticulum, ribosomes, glycoger and lipid-like bodies. The basement membrane of these cells is continuous with that of the syncitial distal region. Also present in the perinuclear area are the smooth muscle bundles characteristic of cestodes.

BIS(IMIDOTETRAPHENYLDITHIODIPHOSPHINO-S,S')COPPER(II) AS A TETRAHEDRAL MODEL FOR TYPE I COPPER IN METALLOPROTEINS. Francis T. Wang, Chemistry Department, State University College, Geneseo, New York.

The preparation and characterization of bis(imidotetraphenyldithiodiphosphino-S,S')copper(II) will be discussed. The complex can be prepared from $CuCl_2$ and the potassium salt of the ligand only at -78°. The pure material is stable at room temperature for a few days however. This intensely colored blue complex is proposed as a potential model for Type I copper(II) sites in metalloenzymes. The Spin Hamiltonian parameters [$A_{||}$ = 121G, $A_{\perp}$ = 20.2G, <a> 48.6G, $g_{||}$ =2.107 $g_{\perp}$ =2.030, and <g> = 2.055] are consistent with a rather covalent pseudotetrahedral environment. The intense optical electronic transitions at 407 nm (ε 4100), and 575 nm (ε = 3600) are assigned as M $\rightarrow$S(σ) and M $\rightarrow$S(π) charge transfer bands. Weaker features at 923 nm (ε = 400) and 1350 nm (very weak) are similar to those reported for Type I copper and are assigned as ligand field transitions for the D_{2d} complex. The complex is unstable to auto-reduction to copper(I) at room temperature in the solid state and solution. The complex appears to undergo a first order redox reaction with $k \simeq 2 \times 10^{-3} min^{-1}$. An interpretation of the electron spin resonance parameters and optical absorption values along with a comparison to both Type I copper(II) as well as other copper(II) complexes thought to exist in a similar coordination geometry will be presented.

THREE STUDIES IN SCIENTIFIC BIOGRAPHY: DR. JEROME ALLEN (1830-1894), FORMER GENESEO PROFESSOR; CHRISTIAN KONRAD SPRENGEL (1750-1816), GERMAN BOTANIST; AND ALEXANDER WALKER (1779-1852), SCOTTISH PHYSIOLOGIST. Lawrence J. King, Biology Department, State University College, Geneseo, New York.

Jerome Allen was the first professor of the natural sciences at Geneseo Normal School when it opened in 1871. He remained there for 10 years until his departure for the Presidency of the State Normal School, St. Cloud, Minnesota. While at Geneseo Professor Allen authored, "Handbook of Experimental Chemistry for Laboratory use", (1876); obtained a U.S. Patent, "Improvement in Processes of Preparing Autographic Stencils", (1879); and in 1877 wrote numerous "Science Notes" for The National Teacher's Monthly. The Natural Science Department had five rooms available including a chemical storeroom and laboratory. Collections of "upwards of 5,000 specimens were on hand" including plants and animals, fossils and minerals, and "Dr. Ward's Indian Collection". Jerome Allen was much interested in electricity and reportedly had been in contact with Thomas Edison regarding the use of his inventions in instruction. On hand was a "fine telescope of sufficient power to separate the rings of Saturn..." He taught botany and the students were required to analyze 50 flowers, and to have the same number in a herbarium.

Professor Allen, the son of a physician, was born in Westminster, Vermont, in 1830. He graduated from Amherst College in 1851 with an A.B. degree, and also studied theology at Hartford Seminary. His early professional career was spent in Iowa where he founded the Iowa State Teacher's Association. He was the first Iowa author of a textbook, "A Grammar and Analysis of the English Language", (1867), and the author of works on map drawing. An honorary Ph.D. was conferred in 1881 by Lennox College, Iowa, where he was formerly the President.

He joined the staff of New York University in 1886 and from 1887 to 1894 was a Professor and Dean of the School of Pedagogy. He was an internationally known educator and the author of many articles in educational periodicals, of a group of excellent books on teacher training, and of "Lectures on the History of Education", (1891). Possibly due to his scientific training he advocated the "learning by doing" and the questioning and investigative approaches to learning - his favorite motto was, "Investigate for yourself." See, "Materials for a Biography of Dr. Jerome Allen..." (44 pages and epilog; 116 pages of documents and letters. Geneseo, N.Y., 1973). Copy in Milne Library, State University College, Geneseo, N.Y.

C. K. Sprengel was a German botanist and author of "The Newly Revealed Mystery of Nature in the Structure and Fertilization of Flowers", (Berlin, 1793) - a book Charles Darwin later acquired. This is cited in Darwin's "On the Origin of Species", (1859) and provided evidence for his theory of "Natural Selection". See, Dictionary of Scientific Biography, (Scribner's), 13:588-591,1975.

Alexander Walker, a Scottish physiologist, was the author of a large number of works popularizing science during the Victorian era. See, Dictionary of Scientific Biography, (Scribner's), 14: 128-131, 1976.

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