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PROCEEDINGS
OF THE
ROCHESTER ACADEMY OF SCIENCE, INC.

ABSTRACTS OF PAPERS

TENTH ANNUAL SCIENTIFIC PAPER SESSION
ST. JOHN FISHER COLLEGE
NOVEMBER 12, 1983

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ELEVENTH ANNUAL SCIENTIFIC PAPER SESSION
ROCHESTER MUSEUM AND SCIENCE CENTER
SEPTEMBER 15, 1984

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TWELFTH ANNUAL SCIENTIFIC PAPER SESSION
MONROE COMMUNITY COLLEGE
NOVEMBER 2, 1985

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ROCHESTER ACADEMY OF SCIENCE, INC.
TENTH ANNUAL SCIENTIFIC PAPER SESSION

and

ANNUAL FALL PUBLIC LECTURE

"The Coevolution of the First Plants and Animals to Appear on Land"
by Harlan P. Banks

ST. JOHN FISHER COLLEGE, ROCHESTER, NEW YORK

Chairmen: Melvin J. Wentland, Ph.D.
Stanley Gawlilk, Ph.D.

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AEROBIC RESPONSE TO LOADING IN COCKROACHES. J.A. Assad and R.J. Full. SUNY/Buffalo.

The aerobic cost of pulling a load (paperclips) during exercise was determined for the cockroach *Blaberus discoidalis*. The animals were run on a miniature treadmill enclosed in a respirometer. A harness (thread) was secured to the animals and passed through a small hole in the rear of the respirometer. The harness was draped over a frictionless air pulley and could be loaded with weights to produce a force exactly opposite the animals' direction of movement during exercise. Following a 15 min. rest, the animals were run at 0.07 km/hr for 10 min. At 10 min. intervals thereafter, the load was increased by 0.5 times the animal's mass. Oxygen consumption, monitored continuously with an S-3A Applied Electrochemistry Oxygen Analyzer, was found to increase directly with the weight pulled. This is consistent with data obtained in similar experiments utilizing a variety of vertebrates. Supported by NSF grant PCM 79-02890.

BEHAVIORAL RESPONSES OF BOBOLINKS (DOLICHONYX ORYZIVORUS) TO VISUAL AND MAGNETIC CUES. Robert C. Beason. Biology Department, State University of New York, Geneseo, NY 14454.

The bobolink (Dolichonyx oryzivorus) has the longest trans-equatorial migratory path of any New World landbird, spending the non-breeding season south to northern Argentina. This species responds to changes in the earth's magnetic field in a manner which indicates that it uses the magnetic information (possibly the horizontal component) as a primary orientation cue during its migration. When both adult-caught and hand-reared birds were tested experimentally in a planetarium, their behavioral responses indicated that they use an integrated navigation compass composed of at least the magnetic field information and the star patterns of the night sky. Between these two cues, there is an hierarchial arrangement, with directional information transferred from the magnetic field to the stars for use on a nightly basis.

PRIMARY PRODUCTION OF CLADIUM MARISCOIDES IN ZURICH MUD POND.
John M. Bernard, Franz Seischab, and Gail Jacoby, Department of Biology, Ithaca College, Ithaca, NY 14850 and Department of Biology, Rochester Institute of Technology, Rochester, NY 14623.

Seasonal changes in the numbers and weight of

shoots aboveground and the weight of roots and rhizomes belowground were determined. There were approximately 1000 shoots/m^2 in May, about half were shoots with little or no brown tissue. Both categories of shoots declined throughout the growing season but were replaced by new shoots which began emerging in June and July. Green shoot weight reached a maximum of 224 g/m^2 in late August, most of the total contributed by young shoots of spring.

Belowground standing crops reached maxima of 68 g/m^2 for roots and 51 g/m^2 for rhizomes. We estimate belowground production to be approximately 47 g/m^2/year, 27.3 g/m^2/year from roots and 19.3 g/m^2/year from rhizomes.

The life history of Cladium will be discussed.

OSMOREGULATION OR TURGOR REGULATION IN CHARA?
Mary A. Bisson, Dolores Bartholomew, Dept. of Biol. Sci., State University of New York at Buffalo, Buffalo NY 14260

It is known that marine macroalgae regulate their turgor in response to variation in salinity. The question arises of whether fresh water macroalgae also regulate their turgor. Since the cells are exposed to an environment of much less negative osmotic potential, there may not be a need for direct regulation of turgor. Previous studies suggested that fresh water algae regulate osmotic potential, not turgor, which can provide adequate turgor regulation for fresh water plants. These studies, though, can be criticized on the grounds of unnatural or unusual conditions, e.g., constant exposure to light, or too short of an exposure time to solutions of different osmotic potentials. Since these results are unclear, we proceeded to do experiments correcting for these and other possible criticisms.

We found that varying the length of light exposure had no effect on turgor. Turgor was found not to be maintained constant in cells exposed to outside solutions of various osmotic potentials. Rather, osmotic potential was found to be maintained constant, very efficiently in solutions containing $CaCl_2$ or raffinose and less efficiently in solutions containing NaCl. Decreasing the pH of the solution from 7 to 5 decreased turgor. Increasing the solution pH from 7 to 9 had no effect on the turgor. Chara does not seem to regulate its turgor. Instead, it regulates its osmotic potential; the the alga is considered an osmoregulator.

ANAESTHETIZATION AS A METHOD FOR STUDYING COURTSHIP BEHAVIOR IN LIVE-BEARING AQUARIUM FISHES. Bradley Bowden, Department of Biology, Alfred University, Alfred, New York.

Several studies have demonstrated that courtship behavior in poeciliid fishes such as the guppy, Poecilia reticulata, involves a series of reciprocal behavioral interactions between the male and female. Anaesthetization of the female with Finquel prior to placing her with a male will usually illicit a complete courtship repertoire that culminates in successful insemination. This occurs even though the female is not actively participating

and may not have been behaviorally receptive under unanaesthetized condictions.

In addition to providing a method of securing individual inseminations and demonstrating courtship displays, successful inseminations of anaesthetized females raises questions about the behavioral cues female guppies provide during normal courtship.

THREE YEARS OF BREEDING BIRD STUDIES OF SHRUB-MEADOW AND FOREST IN THE BRISTOL HILLS. Lynn Braband, Roberts Wesleyan College, 2301 Westside Drive, Rochester, N.Y. 14624

Breeding bird populations were studied by spot-mapping from 1981 through 1983 on a 20-hectare shrub-meadow plot and a 16-hectare forest plot north of Naples, N.Y. The shrub-meadow plot averaged 18 breeding species, while the forest plot averaged 6 breeding species. Densities of territorial males of all species averaged 33 per 10 hectares in the shrub-meadow and 10 per 10 hectares in the forest. The most common species in the shrub-meadow were the Chestnut-sided Warbler, Common Yellowthroat, Indigo Bunting, Field Sparrow, Song Sparrow, Rufous-sided Towhee, and Chipping Sparrow. The most common species in the forest were the Ovenbird, Red-eyed Vireo, Hermit Thrush, and Eastern Wood-pewee. The diversities and annual variability of the plots are discussed. Species of particular interest, including the Blue-winged Warbler, Golden-winged Warbler, Prairie Warbler, Northern Goshawk, and Brown-headed Cowbird, are also mentioned.

DIET, SEASONAL OCCURRENCE AND POPULATION STRUCTURE OF VIRGINIA VALERIAE PULCHRA (SERPENTES; COLUBRIDAE) IN NORTHWESTERN PENNSYLVANIA. T. H. Cervone and R. C. Bothner, St. Bonaventure University, St. Bonaventure, New York.

V. v. pulchra feeds solely on earthworms. The snake's size determines the earthworm species consumed. Gravid females feed less often than non-gravid females. Feeding appears to be frequent in this snake.

This snake shows a diurnal activity pattern and is more readily collected in the spring and fall than in the summer. Immature snakes are less commonly encountered than are adults. Availability of snakes increases during or immediately after a rain.

Male V. v. pulchra live 6 years or more, while females live 7 years or more. Growth rates for both sexes are similar from birth through the third active season. Thereafter, the females grow at a greater rate.

THE FEMALE REPRODUCTIVE CYCLE OF VIRGINIA VALERIAE PULCHRA (SERPENTES; COLUBRIDAE) IN NORTHWESTERN PENNSYLVANIA. T. H. Cervone and R. C. Bothner, St. Bonaventure University, St. Bonaventure, New York.

V. v. pulchra is an ovoviviparous temperate zone snake displaying a pre- and post-copulatory pattern of gametogenesis. Females reach maturity in the spring of their fourth year (44 months from birth) at a live snout-vent length of 214-227mm. These adults have four different size groups of ovarian follicles representing 3 age classes. Ovulation extends anywhere between the first week of May to mid-June with extrauterine migration of ova occurring in approximately 25% of these gravid females. Parturition extends from 16 August to 20 September and gestation averages approximately 105 days. Corpora lutea are found throughout gestation, but degenerate rapidly after parturition. Litter size (one/year) averages 6.0±1.8 (Range = 2 to 11). The young are quite large at birth averaging in total length 40.6% that of their mothers. Young show a sex ratio of 1:1. Mating occurs either in the spring or fall.

ANTIVITELLOGENIC PROPERTIES OF PURINE AND PYRIMIDINE ANALOGS ON REPRODUCTIVE PERFORMANCE IN BRACON HEBETOR (HYMENOPTERA; BRACONIDAE). T. H. Cervone and W. L. Wissinger, St. Bonaventure University, St. Bonaventure, New York.

The parasitoid wasp, Habrobracon juglandis (Ashmead) = Bracon hebetor Say was used as an assay system for evaluating the effects of 5-Fluorouracil (pyrimidine) and 6-Mercaptopurine (purine) in vivo. Being a highly evolved insect and eukaryote, this wasp is ideally suited as a submammalian test system because of its exact linear sequence of cell types within polytrophic ovarioles from which ova are developed. Subsequent vulnerability or tolerance of these cell types to chemicals within the wasps metabolically activating and/or inactivating systems allows one to distinguish between general physiological insult, effects due to altered protein synthesis, and damage to DNA molecules. This is accomplished by simply scoring production and viability of eggs laid per unit time from feeding compounds to wasps.

The antimetabolites 5-Fluorouracil and 6-Mercaptopurine, when fed at subacute doses to virgin female B. hebetor, caused a consistent lower egg production and significant reductions in egg viability of oocytes exposed during vitellogenesis. Both compounds produced genetic and physiological effects in this wasp. However, genotoxicity of these compounds during embryonic development varied depending upon the degree of starvation prior to feeding. This was indicated when stage of death in embryos developing from oocytes exposed during vitellogenesis were examined. Based on our results, it appears that assay's involving antimetabolite compounds must be interpreted with care before passing judgement regarding their genetic damage potential.

FACTORS AFFECTING ASEXUAL REPRODUCTION BY THE SEA ANEMONE AIPTASIA PALLIDA. William S. Clayton, Jr. Department of Biological Sciences, State University of New York at Buffalo, Buffalo, New York.

Many anthozoan cnidarians which are capable of some form af asexual reproduction also contain endosymbiotic alage, and the presence of these symbionts may affect the process of asexual reproduction. This possiblity was examined by studying pedal laceration of symbiotic and aposymbiotic Aiptasia pallida (Verrill) maintained at varying feeding regimes and anemone densities in the laboratory. Pedal laceration was inversely related to feeding regime in most experiments but met Poisson expectations for random occurrence among individuals and among days between feedings. The presence of zooxanthellae increased pedal laceration of starved individuals at an anemone density of 2/15 ml but inhibited pedal laceration at an anemone density of 1/15 ml. Lacerates produced by symbiotic individuals had a significantly greater dry weight than lacerates produced by aposymbionts. This difference can be largely attributed to the presence of zooxanthellae in symbiotic lacerates which comprised 55 - 60 % of lacerate dry weight. Development time and survival of lacerates to juvenile anemones was not significantly different for symbiotic and aposymbiotic lacerates and lacerate dry weight did not change during development. Under these conditions, the presence of zooxanthellae had little effect on lacerate development but enhanced pedal laceration under select culture conditions.

Effects of pH on Invertebrate Diversity in Nine Adirondack Lakes. B. Daatselaar, 58 Harloff Rd., Honeoye Falls, NY 14472. Nazareth College.

During the summer of 1983, research was conducted on nine acid sensitive Adirondack lakes. This research investigated the hypothesis that invertebrate diversity would be low as a result of low pH. Water samples were collected and preserved for later analysis. The pH and O_2 content was also recorded. The invertebrate specimens were observed and identified, and the species and number of individuals were recorded. Because the nine lakes sampled all had relatively acidic conditions, species diversity values will be compared to the diversity of less acid sensitive lakes in western New York.

COMPUTER APPLICATIONS IN ANTHROPOLOGY: INITIAL EXPLORATIONS. David Howard Day, Department of Sociology-Anthropology, Monroe Community College, Rochester, New York.

An intellectual safari into the land of silicon and software is described, especially as it relates to an examination of the ways computers are being applied in the four subdisciplines of anthropology: archaeology, biological anthropology, linguistics, and socio-cultural anthropology.

The evolution of these computer applications is traced from the pre-personal computer era when relatively large computers

located at large institutions were used by relatively small numbers of anthropologists for tabulating,data storage and retrieval and statistical analysis. A wide variety of current computer applications is briefly discussed,including their use in simulations,in game-playing,in creating data banks,in social action programs and in creating scattergrams and histograms for archaeological site reports.

Finally,plans for computerizing data from an archaeological site on the Monroe Community College campus are discussed.These plans are set in the context of general problems encountered as non-technically oriented social science faculty adapt to the twin realities of the computer era on one hand,and scarce funding on the other.

RECOMBINANT DNA TECHNOLOGY TECHNIQUES.
Mark W. Fenlon, Biology Department, Jefferson Community College, Watertown, New York 13601

The precise execution of restrictive enzyme digestion of DNA and the subsequent agarose gel electrophoresis will be outlined and, in part, demonstrated. The techniques will be presented as a possible starting point for the utilization of recombinant DNA technology in laboratory teaching or research.

The impact of this technology on our approach to studying the genome on all levels (gene mapping, gene regulation, etc.) as well as its important applications to such areas as industry, medicine and agriculture will be cited.

A SCANNING ELECTRON MICROSCOPE STUDY OF THE COMPARATIVE STRUCTURE OF THREE TYPES OF HUMAN GALLSTONES.
Roslyn Freeze and Clint Tallman, Genesee Community College, Batavia, NY 14020.

Several gallstones were separated according to type (pure, mixed, and combined) and chemically prepared in accordance to the stone constituents. Fracture surfaces were sputtered with Palladium and examined with an ISI scanning electron microscope.

Pure calcium bilirubinate stones had large crevices with fiber-like structures and oval spaces. This porous network is the bilirubin complex. Scattered upon this surface are small calcium crystals.

Cholesterol crystals were long and slender with the appearance of filaments radiating from a central point. A second variety of crystals was rectangular and often stacked to form a structure with multiple surfaces. These crystals have small bulbous particles between them. It is possible that they may have been involved in coalescence. In a pure cholesterol stone different crystal structures appear to form together. It has been postulated that crystalline structure variance within a

pure stone is due to changes in gallbladder physiology and bile composition.

Pure calcium carbonate fractures demonstrated accumulations of crystals with rhombic clevage. Some crystals were columnar shaped with no orientation.

The mixed and combined stone fractures demonstrated fibrous material at their centers. Also, a partially formed spherical body was identified at the center of a mixed stone with a pure cholesterol core. This structure may serve as a nucleus around which the cholesterol core of a gallstone is formed.

EXERCISING CRABS: AN INTRASPECIFIC COMPARISON OF THE COST OF LOCOMOTION AS A FUNCTION OF MASS. R.J. Full, SUNY/Buffalo.

Ghost crabs (*Ocypode quadrata*) of two different size classes were exercised on a miniature treadmill for 20 min. After a 30 min rest period crabs in the small size group (2.1g) were run at 0.13, 0.19 and 0.28 km/h, while indiviuals in the larger group (26.6g) were exercised at 0.20, 0.40 and 0.60 km/h. All crabs received a 30 min recovery period after exercise. Oxygen consumption ($\dot{V}O2$) was monitored continuously throughtout the rest, run and recovery period.

The mass specific resting $\dot{V}O2$ of the large crabs was 1/3 that of the smaller animal's rate. The aerobic response to exercise was similar for both groups; a rapid increase in $\dot{V}O2$ leading to a steady-state O2 uptake ($\dot{V}O2ss$). $\dot{V}O2ss$ increased linearly with velocity (V). $\dot{V}O2ss = 3.7V + 0.4$ for the small crabs and $\dot{V}O2ss = 0.86V + 0.18$ for the larger animals.

The cost of transport, the amount of oxygen required to move a gram of animal one kilometer, declined as velocity increased. Large crabs consumed 4 times the oxygen of small crabs when exercise at a common velocity (0.20 km/h) is compared. However, the mass specific cost of transport for large animals at this velocity was 1/3 that of the smaller animal's value. The mass-specific minimum cost of transport (Mrun), determined from the slope of the $\dot{V}O2ss$ vs. V relationship, also showed a lower cost for the larger animal.

The allometric relationship developed from an interspecific comparison of birds and mammals shows a decrease in Mrun with an increase in body mass. Intraspecific comparison of Mrun in the ghost crab follows this trend over an order of magnitude in mass. When ghost crabs develop and increase in size, they become more economical at locomotion. Supported by NSF grant PCM 79-02890.

TEACHING BIOLOGY IN THE PEOPLE'S REPUBLIC OF CHINA. Gin K. Gee, Corning Community College, Corning, New York

A first-hand account of teaching biology in China is presented. Discussion includes administrative protocol in the biology department, academic level, research projects, and interactions with students and colleagues.

Observations were drawn from five institutions: Jinan University; South China Agricultural College, Yunnan University, Wuhan Medical College, and Northeast Agricultural College in Harbin.

The main features of China's post Cultural Revolution biology programs are:

Biology programs were abolished in all high schools and most universities during the Cultural Revolution (1966-1976), and were reinstituted in 1978. University biology departments emphasize a basic biology curriculum with the addition of environmental biology and molecular biology in some universities. In a relatively short period of time the Chinese have made significant recovery in the field of basic biology.

The biology department has both a political chairman and an academic chairman. The former explains Party policies, and establishes good morale and working relationships. The latter organizes teaching schedules, develops programs, and proposes budgets.

The faculty-student ratio is 1:1, and in some cases, 2:1.

Most research is applied dealing with population control, environmental pollution, and improving agricultural yields.

A graduate degree program (MS) in biology has been established in most major universities. While there is a paucity of advanced research equipment, scholarly experiments are undertaken by students.

The biology department in most universities is eager to engage in exchange programs. Suggestions will be offered to biologists who wish to participate in such exchange programs.

AN UPDATE ON THE VASCULAR FLORA OF ONTARIO COUNTY. Bruce Gilman, Department of Natural Resources Conservation, Community College of the Finger Lakes, Canandaigua, New York 14424.

During the Spring of 1983, the first checklist of vascular plants occurring in Ontario County was published. Extensive field work over five growing seasons and searching through historical herbarium collections within western New York revealed an initial list of 1,233 species. Noteworthy is the inclusion of 104 species previously not known from the county but discovered through my field collecting. Recent additions to the list and plans for annotating it will be discussed. Single complimentary copies of Ontario County Flora will be available.

A SCHEME FOR AN INEXPENSIVE MICROCOMPUTER LAB. W.J. Graham, Biology Department, Monroe Community College, Rochester, New York.

Money for equipment seems to be in short supply and the costs of

computer equipment still is high. We want to offer a course in Computer Applications in Biology for Biology majors. This is a scheme to provide students with the greatest amount of time at a computer as possible using cost-sharing by the student.

A laboratory will be set up with 10 home computers with 64K of memory. A networking arrangement will reduce the cost of disk drives and printers to the minimum, less than $600 for color or $500 for a green monitor.

Students will have three options for computer-use during the course. These are:

1. Purchase a microcomputer and use it at home at their own convenience. These students can serve as tutors in the lab.
2. Rent a microcomputer from a local dealer. Part of the rental monies could be applied to a unit later. They can use the microcomputer at home and serve as tutors.
3. Use a microcomputer in the lab during class time and arrange their schedules to spend time in the lab when machines are available.

We anticipate that students who own or rent equipment can spend more time working with it and can become adept in its use. They should, then, be able to serve as tutors for others. Using this plan we should be able to provide an excellent program for up to 20 students per class with a minimal outlay by the school. A printer will be available in the lab so that work done at home and saved to disk or cassette can be printed out as hard copy for evaluation. Of course, a student who has access to a different computer at home and can provide a printout of their work would be encouraged to take the course and to assist other students.

AN ARCHAEOLOGICAL DIG AT THE CHARLOTTE LIGHTHOUSE SITE.

Bob Gullo
St. John Fisher College
Rochester, New York

In 1982, the Community Association of Charlotte leased the Lighthouse property from the U. S. Coast Guard to establish a historic museum. Since that time, the Charlotte/Genesee Lighthouse Preservation Society has been formed to raise funds and carry out educational goals for people of all ages concerning the history and role of the Lighthouse during the heavy shipping traffic on Lake Ontario. Research is presently being conducted on the life and times of Captain James Van Cleve who was most active as a steamboat captain in the early days on Lake Ontario. His primitive paintings of the original lighthouse and the Mouth of the Genesee have created much enthusiasm for continued investigation.

The Department of Anthropology/Archaeology at St. John Fisher College has agreed to excavate the site and to try and locate the original lighthouse keeper's home which was built in 1822. Students,

staff, and local volunteers are presently working on the site.

Hopefully by next year, the original house will be excavated and the lighthouse museum will be a reality.

EFFECTS OF LIGHT, TEMPERATURE AND pH ON COMPETITION BETWEEN A GREEN AND A BLUE-GREEN ALGA. Patricia J. Hadden-Carter and John F. Storr. Department of Biological Sciences. State University of New York at Buffalo.

In situ studies on the response of green and blue-green algae in acid-stressed lakes have produced contradictory results. In general, blue-green algae are highly sensitive to pH stress. In some lakes, however, they are dominant at low pH. While green algae are sometimes eliminated at low pH, at other times they are dominant. Both groups appear to be of minor importance in Canadian lakes, while in Florida lakes they comprise the two most important algal groups; depressed pH is associated with a shift from blue-green to green algae. Succession of green to blue-green algae has been attributed to nutrient shifts, temperature and light levels; it appears that pH may also be critical.

In this study, mixed cultures composed of one green alga (Scenedesmus quadricauda) and one blue-green alga (Anabaena sp.) were used to investigate the role of acidification (pH 3 through 7) in competition over a range of temperatures and light intensities. Nutrient levels were not limited. Outcomes were predicted on the basis of unialgal growth rates at each light-temperature-pH combination; predictions were compared with observed results when the cultures were grown together. In general, the green alga was favored at low pH levels and higher light intensities. The blue-green alga was favored at higher temperatures, higher pH levels, and lower light intensities. When growth in mixed culture was contrasted with growth in unialgal culture, in no instance did the presence of one alga stimulate growth of the other. Anabaena sp. inhibited growth of S. quadricauda most strikingly at highest pH and light levels, where S. quadricauda depressed growth of Anabaena sp. at the lowest pH levels. Mutual inhibition frequently occurred, especially at the lowest pH levels.

LONG DISTANCE CRABS: THE EFFECTS OF TRAINING. J.M. Harwitz and R.J. Full, SUNY/Buffalo.

Forty untrained fiddler crabs, *Uca pugilator*, were kept under environmental conditions identical to those of trained crabs. Control data generated by these crabs were then

compared to the results obtained from trained animals. Crabs were trained on a treadmill five days a week for a five week period. The daily training velocity was 0.12 km/h during the initial three weeks of training and was increased to 0.18 km/h for the final two weeks. Time spent training at a given velocity was progressively increased each week and ranged from 30 to 60 min/day.

Three criteria were used to evaluate the effects of training: 1) Performance on an endurance test. Time until fatigue was measured at a range of treadmill velocities. 2) Net whole body lactate (WBL) production. Crabs were sacrificed at 3 min intervals during a treadmill run at 0.16 km/h in order to determine the rate of WBL production throughout a 15 min exercise period. 3) Oxygen consumption ($\dot{V}O2$) during a 15 min treadmill run at 0.16 km/h.

When compared, data from trained and untrained crabs differed with regard to all 3 parameters. Endurance was greatly increased at velocities from 0.10 to 0.20 km/h; 6 of 10 trained crabs ran the maximum allotted time of 2 h while the untrained crabs averaged less that 80 min. $\dot{V}O2$ during exercise rose more quickly in the trained crabs and a steady-state $\dot{V}O2$ was attained. The percentage of ATP provided by means of the aerobic pathway in the trained crabs (57%) was much greater than in the untrained animals (25%). The net WBL production during exercise was significantly lower in the trained animals (0.035 compared to 0.058 mg/g.min). The results indicate that exercise endurance and the metabolic response to exercise in the fiddler crab are significantly affected by training as is the case with mammals.
Supported by NSF grant PCM 79-02890.

TURGOR REGULATION IN C. BUCKELLII, A CHAROPHYTE FROM AN UNUSUAL SALINE ENVIRONMENT.

Rosanne Hoffmann, Mary A. Bisson, Dept. of Biol. Sciences, State University of New York, Buffalo, N.Y. 14260

Chara buckellii (C. Dont.), a euryhaline charophyte, was collected from a saline lake in Saskatchewan, Canada which has approximately 120 mM each of Na^+, Mg^{2+}, Cl^- and SO_4^{2-} (salinity = 24 ppt, osmolality = 375 mOsm/kg). We have obtained evidence that this alga is capable of regulating its turgor ($\Delta\pi$) when challenged with an osmotic stress. After 9 days of acclimation to a gradual 350 mOsm/kg increase or decrease in external osmotic pressure (π^o), $\Delta\pi$ is maintained within a range of 211 $\pm$ 14.5 to 324 $\pm$ 3.6 mOsm/kg (SE, n = 3) hyperosmotic to the medium. Similar results were obtained from plants cultured in lake water ranging in π^o from 96 to 550 mOsm/kg. This change in internal osmotic pressure (π^i) is effected by selective changes in cell sap ion concentration. In response to an increase or decrease in π^o, $[K^+]^i$, $[Cl^-]^i$ and $[Na^+]^i$ change significantly and are primarily responsible for the observed changes in π^i.

THE TAO OF INTERCROPPING: RESPONSIBLE FOOD PRODUCTION IN THE THIRD WORLD.

Donald Q. Innis, Geography Dept. SUNY, Geneseo, N.Y. 14454

Intensive study and field work in first and third worlds reveal that third world farmers may not have such high yields of a single crop, nor as high profits per farmer, but they do have higher total yield for any given amount of resources used, have less soil erosion and leaching, keep soil in better condition and control disease, insects, and weeds without the use of poisons. If they use mineral fertilizers they recover a higher percentage of each kilogram used because intercropping (growing more than one crop per field) with its intertwining extensive root systems recovers more of the downward leaching nutrients than can be recovered by the root system of any single crop.

Intercropping is used in all third world countries, apparently because it is a system of soil treatment which preserves soil fertility. Corn and beans in pre-Columbian Americans, sorghum and cowpeas in Africa, oats and peas in medieval Europe, wheat and chickpeas in Persia, millet and pigeon peas in India, rice and soybeans in China are grain/legume combinations which provide nitrogen to the soil, carbohydrate and complementary protein to the farmer. Modern methods of monocropping which use machines to reduce labor costs and increase profits use sprays to control weeds, insects, and diseases; and nutrients from mines to replace nutrients lost through depletion, erosion and leaching. As sprays become more dangerous and less effective and mined nutrients become scarcer and more expensive, it is becoming essential for agronomists to study pre-modern methods for ideas which will allow agriculture to continue and allow people to continue to get food to eat.

Examination of Third World ideas reveals a different philosophical approach. Taoism states that everything is connected to everthing else. Applying the idea of Yin and Yang to agriculture might be done as follows. In the Orient food is obviously good, and sewage is different but also good--the two are closely related and more food cannot be grown indefinitely without returning sewage and nutrients to the soil. In the West food is good and sewage is disgusting and is often dumped in the ocean to get rid of it. Small farms allow intense, conservative supervision of the land to achieve maximum yields in the long run instead of just the short run.

ADVENTURES IN TEACHING - SOME THOUGHTS ON THE OPTIMUM WORK IN A n-STEP ISOTHERMAL EXPANSION/COMPRESSION OF AN IDEAL GAS: w_n.* Bhairav D. Joshi, Department of Chemistry, State University College, Geneseo, New York, 14454.

Traditional approaches of teaching the concepts of thermodynamic work are examined. The problem of evaluating optimum work during a n-step isothermal process, w_n, involving an ideal gas expansion or compression, is then analysed and presented using tools readily available to undergraduates embarking on a study of thermodynamics. It is then analytically and graphically demonstrated that w_n becomes identical with the reversible work, w_{rev}, discussed in standard textbooks on thermodynamics, as n approaches infinity. The concepts of "fractional reversibility" and "process quotient" are developed by comparing w_{rev} and

w_n for a given n. Finally, pedagogic merits of this approach are presented.

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*Paper presented at the 10th Annual Session for Scientific Papers, Rochester Academy of Sciences, St. John Fisher College, Rochester, NY. November 12, 1983.

IROQUOIS FOLK ZOOLOGY. Russell A. Judkins, SUNY College of Arts & Science, Geneseo, New York.

Traditional New York State Iroquois zoological knowledge is reflected in the folklore of the Seneca and other Iroquois groups. An examination of this body of aboriginal knowledge demonstrates that there is substantial variance between its lists of extant zoological entities, and the lists of those empirically observable. The role of cultural, including economic, factors is examined in explaining this divergence. Abstract knowledge, culturally relevant knowledge, and modes of encoding knowledge are seen to be three independent variables in understanding the particular perspective on zoology reflected in this body of Native American animal lore.

AGGRESSIVE AND ESCAPE BEHAVIOR IN N.Y.S. RATTLESNAKES Kent M. Lechner, Dept. of Biological Sciences, SUNY at Brockport, Brockport, N.Y. 14420.

Field experience with the Timber rattlesnake(Crotalus horridus)and the Massasauga rattlesnake(Sistrurus catenatus),has demonstrated that both species generally exhibit aggressive behavior only under certain specific circumstances.

The most common of these circumstances occurs just prior to, and immediately following,the shedding of its skin.The first instance is evidenced by opaque, bluish eyes and dull skin appearance, while in the second case, the snake is vividly marked and has a very high gloss. In both cases, the animal has little or no vision, and will strike at any motion or physical presence.

The animals will also strike when stepped upon or grasped by the front one-third of their body, thereby constricting heart and lung functions. Adult male and newborn rattlesnakes appear to be the most easily provoked.

Except when surprised, however, both species appear to prefer escape to confrontation. If escape is impossible they rely upon their excellent natural camouflage and, when intrusion persists, they rattle vigorously to warn the intruder.

During the capture and handling of approximately two hundred rattlesnakes, varying from newborn Massasaugas 20 cm. long weighing 18 g., to Timber rattlesnakes 145 cm long weighing over 1000 g., none have persisted in exhibiting aggressive behavior after being released.

SAVING HISTORY: RESCUE ARCHAEOLOGY AT TELL SAFUT, JORDAN. John R. Lee, Dept. of Anthropology, St. John Fisher College, Rochester, New York.

In 1982, the proposed doubling of the width of the main highway between Amman, Jordan and the border of Syria seriously imperiled Tell Safut, one of the few anciently inhabited mounds (or tells) existing in Jordan, particularly in the north of the country and dating to the Middle Bronze to Late Iron Age (2200-ca. 500 BC). A group of American archaeologists, alarmed at the prospect, asked permission of the Department of Antiquities of Jordan to probe the site to determine its historical importance, the idea being to establish strong enough reasons for an alteration in the course of the road to avoid destroying the ruin. This illustrated presentation traces the organization of the expedition, the results of the excavation and the compromises and politics of modern archaeology.

A Comparison Of Primary Insect Cell Cultures Derived From Fertilzed And Unfertilized Eggs Of The Hymenopteran Bracon Hebetor. M.C. Luce, W.L. Wissinger. Department of Biology St. Bonaventure University, St. Bonaventure, NY.

After obtaining primary cell cultures using eggs from unmated and mated Bracon hebetor females various growth parameters were examined to determine optimal culture conditions. Both haploid and haploid/diploid cultures displayed similar growth patterns. After rapid attachment to the culture dish the different cultures appeared fibroblastic and completed one population doubling within the first week. By the end of two weeks no further increase was noted although mitotic like cells were observed. Cultures maintained up to eight months retained their viability but failed to initiate further growth which would permit the establishment of permanent cell lines.

Of the parameters tested, serum concentration and pH had the most pronounced effects on population increase through Day 7. The genetic constitution of the cultures did not appear to affect the populations when maintained under optimal conditions.

EXERCISE AND COLOR CHANGE: EFFECTS OF DURATION AND INTENSITY ON THE CHROMATOPHORE RESPONSES OF RUNNING CRABS. S.M. Mooney and C.F. Herreid, II, SUNY/Buffalo.

Experiments were conducted to further investigate the color change which occurs in several crab species during exercise. Previous work revealed the general blanching observed was due to a characteristic pattern of the chromatophore response. And that this response is mediated by a blood-borne factor released during exercise.

Male *Uca pugilator* were exercised on a treadmill, with the chromatophores observed at 5

min intervals. Fifteen animals were run at each of three velocities: 0.15, 0.25 and 0.35 km/hr. Color change over time was analyzed using linear regression techniques.

Comparing the mean initial and final chromatophore stages (e.g., 0.25 km/hr trials) one sees that the gross color change is analogous to that of previous experiments; black chromatophore pigment concentrated (1.03 Hogben-Slome units) while red pigment dispersed (+0.71 H-S units) as well as the pigment in the white chromatophores (+1.10 H-S units). Unexercised control animals show negligible change.

Increased duration at a given velocity is found to result in a greater overall magnitude of color change, while the rate of change in fact decreases. Intensity of exercise generally has no effect upon the rate or extent of chromatophore change during the first 20 min. Each type of pigment cell is found to change at a rate signigicantly different from that of the other colors. This indicates that the three types of chromatophores have differential responses to the blood-borne factor released during exercise.
Supported by NSF Grant PCM 79-02890 and BRSG S07 RR 07066-18 of NIH.

MAGNETICALLY SENSITIVE MATERIAL IN THE BOBOLINK (DOLICHONYX ORYZIVORUS). Joan E. Nichols and Robert C. Beason. Biology Department, State University of New York, Geneseo, NY 14454.

The bobolink (Dolichonyx oryzivorus), a transequitorial migrant, has been shown to respond to changes in the earth's magnetic field. The ability to detect magnetic fields in general may be associated with deposits of a brownish-black material that lies in sheaths of tissue around the olfactory bulb and nerve, between the eyes and in bristle feathers which project into the nasal cavity. Histochemical and X-ray analyses confirm that this material is an iron oxide. Magnetometer data suggests that the concentration of ferromagnetic material is sufficient to account for the bird's ability to respond to the earth's magnetic field information, and that the iron oxide is at least partially multi-domain magnetite.

"A PERFECT SETTING": AN ANALYSIS OF VISUAL EMPHASES IN UNITED STATES TOURIST BROCHURES.
Darrell Norris, Adelaide Salisbury, and Leanne Naughton, Department of Geography, S.U.C. Geneseo.

A nested taxonomy of visual emphasis was developed as a means of assessing the inherent bias of the promotional packages mailed to prospective visitors by America's cities and states. A total of 89 city and state brochure packages were analyzed. There are significant differences between the promotional strategies

adopted by city and state tourism agencies, and equally striking differences between America's four principal tourist regions. Non-traditional tourist and convention settings are most inclined to impel and impress the prospective visitor.

THE PERIODICAL CICADA, BROOD VII. L. L. Pechuman, Dept. of Entomolgy, Cornell University, Ithaca, New York 14853.

Brood VII of the periodical cicada is unique in that it is restricted to central and western New York and is the only brood present in New York west of the Hudson Valley. It is due to appear in 1984.

Brood VII first was reported in 1797 and has appeared every 17 years since. There is evidence during the last several emergences that the brood is declining in numbers and may be extinct in some spots where it was abundant in former years.

In 1984, I hope to repeat the survey I made in 1967. Information from anyone encountering emergence will be appreciated. The first appearance is in early June with maximum abundance in mid-June; few specimens are found after July 1. This is well before the appearance of the common dog day cicadas. Cicadas of the genus Okanagana may be present at the same time as the periodical cicada but they lack the bright red eyes of Magicicada.

In 1967, only specimens of Magicicada septendecim were collected. In 1984, a more detailed search will be made to see if M. cassini and/or M. septendecula also are present.

SOME PROBLEMS IN ETHNOGRAPHIC VALIDITY
John D. Rhoades, St. John Fisher College

The significant contribution of ethnography to the understanding of human behavior during the past century has been the accumulation of a wealth of information on the cultures of diverse societies. This in itself is not a noteworthy acheivement since there is certainly available ample descriptions of other cultures from the reports of the many kinds of individuals who have had occasion to observe other societies. The essential value of ethnographic data, and decidedly in contrast to most of these reports, is its claim to validity.

This claim is based upon the distinctive method of participant observation whereby the ethnographer lives with a society and describes its culture by participating in its activities and observing, more or less formally, the verbal and non-verbal behavior of its members. This results in data based not on hearsay, bias, or guesswork, but rather on a society's actual way of life as it is performed and understood by its members.

Still, this is data of a highly personal and contextually-sensitive nature. The accomplishment of an observation by a participant observer by itself is no guarantee of validity; this is achieved only if

the social context of the observation is described and the effects of this context upon the observation are critically evaluated.

SCANNING ELECTRON MICROSCOPE DESCRIPTIONS OF ADULT ENDOFOLLICULAR MITES, CHORTOGLYPHUS SCIURICOLA (ACARI: SARCOPTIFORMES: CHORTOGLYPHIDAE) FROM THE EASTERN CHIPMUNK TAMIAS STRIATUS. W. G. Ross and E. J. Spicka, Department of Biology, State University of New York, Geneseo, NY 14454.

Chortoglyphus sciuricola Hyland and Fain 1968 was described from the deutonymphal (hypopodial) stage which is a phoretic associate of eastern chipmunks, Tamias striatus Linnaeus.

In this study, deutonymphal chortoglyphid mites were expressed from the tail-hair follicles of chipmunks. Some mites were mounted on microscope slides for identification while others were cultured on yeast in rearing chambers. Within six days the deutonymphs had developed into tritonymphs which, in turn, had developed into adult males and females. Adults were removed from the rearing chambers, fixed in glutaraldehyde, dehydrated in ethanol, mounted on studs, and observed with the aid of an ISI (Alpha 9) scanning electron microscope.

The deutonymphs are highly modified for an endofollicular, phoretic association with chipmunks. However, the larvae, protonymphs, tritonymphs, males and females are strictly nidicolous forms that probably feed on detritus and/or fungal growths on nest materials.

PRODUCTIVITY OF AQUATIC MACROPHYTES IN CANANDAIGUA LAKE. Louis Rossi and Bruce Gilman, Department of Natural Resources Conservation, Community College of the Finger Lakes, Canandaigua, New York 14424.

Monthly standing crop harvests of submerged weedbeds at the mouth of the West River were used to estimate annual primary productivity. These estimates ranged between 289.9 grams (dry weight) per square meter to 585.3 grams per square meter. The most productive species was Elodea canadensis Michx. with minor growth also exhibited by Potamogeton crispus L., Myriophyllum spicatum L., Ceratophyllum demerseum L., Heteranthera dubia (Jacq.) MacM. and Vallisneria americana Michx. Seasonal patterns of growth and their relationship to water regime characteristics was examined as a fundamental influencing environmental factor. Comment on the continuing oligotrophic nature of Canandaigua Lake will be discussed.

FINDINGS OF ROCHESTER GAS AND ELECTRIC'S COLD-SHOCK STUDIES ON SELECTED FISHES OF LAKE ONTARIO.
Paul M. Sawyko, RG&E, 89 East Ave., Rochester, N.Y. 14649 and A. Garry Smythe, Beak Consultants, Inc. 12072 Main Rd., Akron, N.Y. 14001.

In 1979 RG&E initiated investigation into the potential for cold-shock to fish at its Lake Ontario power plants for such species as brown trout (Salmo trutta) and rainbow trout (Salmo gairdneri). Test organisms were collected from the discharge canal at RG&E's Ginna Station which had discharge water temperatures of 11.0-15.0°C. These fish were then immediately placed in test waters ranging from 0.4-0.6°C and held for 96 hours (Immediate Cold-Shock) or were acclimated to discharge temperatures for a maximum of two weeks and then placed in test waters for 96 hours (Acclimated Cold-Shock). During ICS Testing 99 brown and 71 rainbow trout were tested with resulting survival rates of 97% and 73%, respectively. ACS Testing completed through 1983 resulted in 95% survival for 64 brown trout tested and 78% survival for 36 rainbow trout tested. Long term survival of these fish has been indicated by subsequent tag return information. Results indicated some substantial differences from previously reported literature in that such studies indicate that ACS Testing would result in less that 50% survival of Rainbow Trout, as opposed to the 78% survival rate found in the RG&E studies. This finding suggests that application of laboratory results should not be generalized to include field locations for which relevant parameters are unknown.

SEA ANEMONE SYMBIOSIS AND REGULATION: SIZE - DENSITY RELATIONSHIPS. Louise Scrocchi. Department of Biological Sciences, State University of New York at Buffalo, Buffalo, New York.

Many sea anemones live symbiotically with dinoflagellate algae, termed zooxanthellae. The temporal regulation of zooxanthellal density to maximize host benefit in the sea anemone Aiptasia pallida has been hypothesized and is currently under investigation. Protein mass was used as a direct measure of anemone size, but protein mass and total anemone zooxanthellae cannot be measured directly without sacrificing an anemone each time. Therefore, oral disc diameter and tentacle zooxanthellae number, which are determinable without animal sacrifice, were examined as potential indices of animal size and total algal number. Results showed a linear relationship between oral disc diameter and protein mass. However, no correlation was found to exist between tentacle zooxanthellae and total anemone zooxanthellae. These results indicated that oral disc diameter could be used as a measure of anemone size, but tentacle zooxanthellae does not directly relate to total zooxanthellae number.

STANDING CROP AND PARTITIONING OF BIOMASS BY Eleocharis rostellata Torr. ON THREE SITES IN THE BYRON-BERGEN SWAMP, GENESEE COUNTY, NY.
Franz K. Seischab, Department of Biology, Rochester Institute of Technology, Rochester, New York 14623, John M. Bernard, Department of Biology, Ithaca College, Ithaca, New York 14850, Karel Fiala, Botanical Institute, Czechoslovak Academy of Sciences, Brno, Czechoslovakia.

Aboveground and belowground living and dead biomass determinations were made on Eleocharis rostellata Torr. removed from three different sites. Plants were removed in August 1982 at the peak of biomass accumulation. The three sites selected were a wet, minerotrophic site, an old, well established site, and a young site on a marl bed.

Live shoots on the wet, old and marl sites had a biomass of 373, 231 and 137 g/m^2 respectively while live roots and shoot bases weighed 384, 1409, and 319 g/m^2 on the respective sites. Total biomass, living and dead, was greatest on the old site (3530 g/m^2) and least on the marl site (784 g/m^2).

The wet site plants allocated the greatest portion of their aboveground biomass to layering culms while marl site plants had the greatest amount of aboveground material in fertile culm biomass. The old site plants had the largest root biomass of any of the three sites.

It appears as if this species uses different strategies of growth and reproduction under each of these environmental conditions. On wet sites it allocates most of its energy to aboveground biomass and reproduces primarily vegetatively. On marl sites more energy is devoted to sexual than to vegetative reproduction. Most of the resources are allocated to roots and shoot bases on the old site.

NOTES ON THE COLLECTION, BEHAVIOR, AND ECOLOGY OF BRACHYCEROUS FLIES (DIPTERA) COLLECTED IN MOROCCO.
Scott C. Sherman, Carey E. Vasey, State University of Arts and Science, Geneseo, New York.

Between March 1980 and December 1981, the senior author collected brachycerous flies extensively in Morocco. Approximately 3,300 specimens were collected, pinned, and shipped to SUNY Geneseo.

The collection is a unique one. Many notes regarding behavior and ecology of specimens taken were noted. The authors are currently in the process of labeling and identifying this collection.

INTERMITTENT EXERCISE IN THE ALLOXAN INDUCED DIABETIC RAT (AD). M. Sleeper, D. Manna, H. Huddle, SUNY at Geneseo. F. Cerny, Children's Hospital, Buffalo, NY.

The adaptation of Insulin Dependent Diabetic children to intermittent exercise has been described. We compared the effects of Intermittent exercise-1 minute work/rest on a treadmill at a slope of 30°- on blood glucose, lactate and pyruvate in 9 hyperglycemic ($\bar{x}$ resting glucose=325 mg%), and 10 matched control male rats (C) (between 150-250 grams). Diabetes was induced by intravenous injection of Alloxan (60 mg/kg). AD received daily subcutaneous injections of insulin. Blood was sampled before and 3-5 minutes post exercise. There was a greater decrease of glucose ($p<0.05$) in the AD during exercise. Lactate and pyruvate levels increased more in the AD than in C.

	Average Δ Lactate	Average Δ Pyruvate
C	+10.769	+ .208
AD	+43.49	+ .963
p	< 0.05	<0.01

Intermittent exercise in AD results in acute hyperlactatemia when compared to C and may limit exercise capabilities.

CLEPTOPARASITISM OF TACHYSPHEX TERMINATUS (SMITH) (HYMENOPTERA: SPHECIDAE) BY THREE SPECIES OF MILTOGRAMMINI (DIPTERA: SARCOPHAGIDAE). Margery Spofford, Frank Kurczewski. SUNY College of Environmental Science and Forestry, Syracuse, NY. David Peckham. Upstate Medical Center, Syracuse, NY.

Three species of miltogrammine flies utilized various phases of the nesting sequence of T. terminatus for parasitic larviposition at two central NY sites (Auburn and Chittenango) in 1981 and 1982. Phrosinella sp. A larviposited primarily in temporarily closed wasp entrances. Senotainia vigilans maintained surveillance perches near wasp nest entrances during burrow construction and hunting forays of the wasp and larviposited on the prey when cues indicated the wasp was occupied with provisioning activities. S. trilineata, attracted by the wasp's provisioning flights, attacked prey in mid-air or on the ground, and larviposited almost always in the presence of the wasp.

T. terminatus exhibited behaviors designed either to prevent larviposition or, if larviposition occurred, to remove maggots from the prey. The wasp countered the satellite-flies with face-offs, chases, and/or diversionary flights. T. terminatus, when cues indicated the presence of the adult fly and/or maggots, cleaned the prey with her mouthparts.

The difference in rates of cleptoparasitism at Auburn (57.9%) and Chittenango (30.6%) may be attributed to the efficiency of prey cleaning by the wasp. This cleaning was 97% effective at Chittenango where S. trilineata was the predominant species. S. vigilans, the

predominant species at Auburn, invariably larviposited when the wasp occupied with provisioning activites, and thus, was more successful in its attacks than S. trilineata. Phrosinella sp. A accounted for approximately 23% of the miltogrammine cleptoparasitism at both sites. The two generations of wasps each summer suffered the same relative amount of parasitism.

A SURVEY OF SOME INTESTINAL PARASITES IN NEWTS BY MICROSCOPIC EXAMINATION OF FECAL MATERIAL. Paula Swarts, Department of Biology, Alfred University, Alfred, New York.

Newts collected from local ponds were isolated in individual dishes until they passed a fecal pellet. Fecal material was mixed with water and fresh preparation examined microscopically for protozoan cysts and helminth eggs. Newts infected with a species of coccidia, a tapeworm and a trematode have been found in local collection. Additional animals are being examined to determine the incidence of the above mentioned and other possible intestinal parasites in newts from collecting sites in the Alfred area.

THE MORPHOLOGY AND HISTOLOGY OF EPIFAGUS VIRGINIANA (L.) BART. WITH FIELD STUDIES. Donna Smith Tomaka and A.F. Finocchio, Department of Biology, St. Bonaventure University, St. Bonaventure, New York 14778.

Epifagus, a member of the Orobanchaceae, found in southeastern Canada and the northeastern part of the United States is commonly known as beech-drops because of its parasitic connection to the roots of the beech, Fagus grandifolia, Ehrh.

The anatomy of Epifagus reflects its totally parasitic nature. The leaves are reduced and lack palisade and spongy layers as well as chloroplasts. The root structure is also reduced. The secondary roots lack root hairs, root caps and endodermal layers. Haustorial tissue is present, serving to connect the vascular tissue of the beech root to that of Epifagus. The plant has cleistogamic and chasmogamic flowers.

Field observations on its life span confirmed Epifagus as an annual plant. A new variation in the color of the plant (color 8 carmine) was found. Most of the plants grew in soil having a pH ranging between 5.5 and 6.4. The average height of Epifagus was 16.8 cm.

A NEW RECORD OF LEPTORHYNCOIDES THECATUM KOSTYLEW (ACANTHOCEPHALA) FROM CONESUS LAKE, LIVINGSTON COUNTY, NEW YORK.

Jean Q. Wade, Carey E. Vasey, State University College of Arts and Science, Geneseo, New York.

Investigations of the parasites of fishes in Conesus Lake has been in progress for nearly 3 years. Between June 21, 1980 and January 24, 1981 a total of 22 fish were caught and autopsied and the following types of parasites were identified: 5 digenetic flukes, 6 pleurocercoids, 1 tapeworm, 3 leeches and 139 acanthocephala. The latter were isolated from the pyloric cecae of all fish examined. One specimen of rock bass was infected with 85 worms. These were identified and verified as Leptorhyncoides thecatum, which has not previously been reported from Conesus Lake.

Contrasting The Biological Effects Of The Direct And Indirect Acting Mutagens Bleomycin And Vinblastine Using Fecundity And Fertility Patterns Of The Wasp Bracon Hebetor. W.L. Wissinger, T.H. Cervone. Department of Biology, St. Bonaventure University, St. Bonaventure, NY.

By utilizing the sex determination system, polytrophic ovariole organization and transparent chorionic egg membrane structural features of the hymenopteran Bracon hebetor it is possible to characterize the biological activities of both chemical and physical agents suspected of having detrimental effects on living systems. When female Bracon were fed either bleomycin or vinblastine at subtoxic doses distinctly different daily fecundity and fertility patterns were observed which could be attributed to direct DNA damage and microtubule disrution by the respective chemicals. Both compounds were incorporated by developing oocytes during their vitellogenic period causing pre-blastoderm death in subsequent embryos. Although egg production was reduced by both treatments, the effects of vinblastine were specific in their attack on oocytes undergoing vitellogenesis at the time of treatment. Vinblastine was also found to prevent gastrulation in those eggs exposed as oogonial cells.

While this wasp has been extensively used in toxicological studies over the past twenty years, its utility as part of a comprehensive testing program has not been fully exploited. As indicated by the reported results, as well as those from other chemical agents having different specific modes of genotoxicity, Bracon would be a beneficial method for testing a variety of agents suspected of having harmful effects on biological systems.

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ABSTRACTS OF PAPERS

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Marvin Gruber, moderator

Session VI: Geology and Geography
Theodore Kury, moderator

POSSIBLE ANATOMICAL AND CELLULAR MECHANISMS OF MAGNETORECEPTION IN THE BOBOLINK. Robert C. Beason and Joan E. Nichols, Biology Department, State University of New York, Geneseo, NY 14454.

Histological examination of Bobolink (Dolichonyx oryzivorus) heads revealed deposits of an iron oxide (probably magnetite) which is thought to be involved in magnetic sensory perception. These deposits primarily lie in sheaths of tissue surrounding the olfactory nerve and in bristle feathers projecting into the posterior nasal cavity. If the Bobolink possesses a magnet map and a magnetic compass, which the Rock Dove (Columba livia) appears to have, each of these deposits may serve one function or the other. If the crystals in the sheaths are attached to stretch receptors or pressure transducers, the torgue induced by the magnetic field on the crystal and its associated receptor would generate sensory information to the brain. The bristle feathers containing the iron-oxide may function in a manner analogous to hair cell mechanoreceptors. The flexure of the feather created by the magnetic field would stimulate receptor cells at the base of the feather, and they would send sensory information to the brain.

A FEMALE IN THE FIELD: SUBJECTIVE INTERACTION AND ANTHROPOLOGICAL FIELD RESEARCH. Amelia Rector Bell, University of Rochester, Department of Anthropology, Rochester, New York 14627

Anthropological fieldwork is always a subjective experience for the researcher and the 'native'. The understandings achieved between the field researcher and the 'native' are primary data for anthropological analysis and its theoretical concerns. This paper shows how being a female researcher had theoretical consequences to the study of Creek Indians' sociocultural system.

DISTRIBUTION OF ELEVATED LEAD LEVELS AND THEIR RELATIONSHIP TO ENVIRONMENTAL AND DEMOGRAPHIC VARIABLES IN SCREENED ROCHESTER CHILDREN. Heather Booth and William Martens.
111 Genesee Park Blvd., Rochester, NY 14611.

Children may experience irreversible damage to developing tissues as a result of exposure to lead in their environment. The Monroe County Health Department has screened Rochester children age 1-6

years old for elevated blood lead levels from 1973 through 1984.

Elevated blood lead levels of individuals who resided at multiple addresses were cross matched with their multiple blood screens over time, demographic information, housing inspection and abatement files. All environmental information had been geocoded which allowed for identification of exact location of individual houses for mapping purposes.

An average of 5,800 Rochester children were screened annually. From 1976 to 1983 there was a 90% decrease in the number of elevated blood lead level cases in the target population which reflects the success of the Monroe County Health Department Childhood Lead Screening, Treatment, and Abatement Programs.

The Health Department also runs an environmental inspection and house abatement program which will be discussed. Children with signs of elevated blood lead resided at 1477 addresses. Of a total 1166 houses inspected by the program, 992 showed peeling lead paint inside or outside, a condition which was partially abated by owners in 726 houses. Such abatement will be discussed as one of the factors contributing to the success of the program.

MAFIC AND ULTRAMAFIC ROCKS FOUND IN TWO FIELD-STONE PILES NEAR BELLONA, N.Y.

Jennifer Brown, 561 S. Main St., Apt. 8, Geneva, N.Y. 14456

Cobbles of mafic and ultramafic rocks of unusual character found near Bellona, N.Y. may be samples of a dike or dike swarm that is unique in New York State. Other dike swarms are known, but their rock types vary considerably from those found near Bellona. The rock types include websterite, pyroxenite, phonolite, and a variety of alkaline mafic and ultramafic rocks with lamprophyric textures. Five samples show unusual spherical structures which may represent the mixing or separation of two immiscible liquids in the magma. The source (or sources) of these rocks has not been found. However, mineralogic similarities together with their unusual character, rarity, and the quantity of the samples argue for a common source.

SPECULATION ON THE GENETIC ORIGIN OF CULTURAL BEHAVIOR: A KEY MUTATION FOR HUMAN ASYMMETRY.

By Anthony D'Agostino, Associate Professor and Chair, Department of Anthropology, St. John Fisher College, Rochester, New York 14618.

ABSTRACT: The most basic elements of culture which separate humans from other animals are the efficient use of tools and the development of language. Evidence is presented suggesting that

a key mutation for lateral dominance formed part of the biological basis for the subsequent development of culture which is dependent upon handedness for the efficient use of tools, and upon cerebral speech asymmetry for the lateral localization of language functions.

PLANT COMMUNITIES ASSOCIATED WITH THE ONONDAGA LIMESTONE IN SOUTHWESTERN MONROE COUNTY AND VICINITY.
Steven I. Daniel. Genesee Country Museum, Mumford.

A botanical survey of the lands in the vicinity of the Genesee Country Museum was begun in the spring of 1984. The survey was part of a biological inventory of the area, to assess the site's potential as an environmental education and research center.

Vegetation of the main plant communities was sampled using the 'releve' technique, recording all species in a given plot, assigning cover values, and recording physical factors. Sampling was supplemented with notes on species distribution and abundance.

The Onondaga limestone, outcropping in the study area, appears to have a profound influence on the flora. It is associated with the occurrence of certain plant communities and species which are otherwise rare in the region.

Noteworthy plant communities include upland forests on soils close to bedrock (grading from oak type to sugar maple - basswood type), mixed mesophytic ravine forest, oak savannah, limestone boulder vegetation, marl meadow, and Oatka Creek floodplain forest.

Interesting species associated with the upland forest and boulders include Chinquapin oak, goldenseal, green violet, tall bellflower, waxberry, hairy honeysuckle, red mulberry, leatherwood, wood lily, white trout lily, moss phlox, and walking fern.

Ravine species include many of the same, as well as twinleaf, small-flowered leafcup, and Goldie's fern.

Noteworthy marl meadow species are swamp lousewort, marsh arrowgrass, Canada burnet, grass of Parnassus, wide-leaved ladies tresses, and fringed gentian.

Oak savannah species include little bluestem, hairy pinweed, wild bergamot, panicled tick trefoil, and gray goldenrod.

Calciphiles associated with the alluvial forest include green dragon, burning bush, bladdernut, and mertensia.

Further studies of the vegetation associated with the Onondaga escarpment should provide more detailed information concerning the distribution and abundance of these and other relatively rare calciphilic species and communities. Calciphilic species are not as well represented in preserves as acid-loving ones. It is hoped that future studies will help to provide a basis for enlightened preservation decisions.

COURTROOM DRAMA, ROLE-PLAYING AND THE TEACHING OF ANTHROPOLOGY

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As interpreters of culture and society, social scientists are constantly challenged to enliven their pedagogics, to impart to diverse audiences a sense of what it means to be a member of a certain society. Following a suggestion by Victor Turner that the more interesting portions of ethnographies may be turned into playscripts to be acted out in class or workshop, this presentation describes the use of the mock trial as a teaching device.

Two courtroom scenarios are outlined. One, executed with great success, constitutes a trial of a medicine woman and testifies to the value of role-playing as an antidote to otherwise turgid ethnography, while affording a lively experience in medical anthropology.

The second case describes a more experimental courtroom scenario focusing on the global problem of antiquities theft. It is argued that role-playing is an exciting way to highlight critical issues like archaeological site preservation and attitudes of the dominant society toward alternative healing traditions. Both the method of conducting these classroom trials and the procedure for drawing up the "casts of characters" is discussed.

SPOROPOLLENIN IN THE OUTER CELL WALL OF PEDIASTRUM BORYANUM.

Stanley R. Gawlik, Biology Department, St. John Fisher College, Rochester, N. Y. 14618.

Pediastrum boryanum is a single-layerd gear-shaped coenobial alga with pronged peripheral cells. Each cell in the colony gives rise to a new colony through mitosis, cleavage and differentiation of the protoplast into zoospores. The zoospores are released in a vesicle through a crescent shaped slit in the outer wall. The vesicle membrane is reported to be the inner wall layer of a bilayered wall. The outer wall layer bears a reticulate triangular pattern of adjacent triangles, is very resistant to decomposition and is recorded in the fossil record. A study of the differentiation of pattern and cell form in Pediastrum led to examining the nature of the outer cell wall. Cell walls harvested after release were exposed to oxidizing reagents and organic solvents. Residues remaining after treatment were examined with an electron microscope to determine what dissolution occured. Resistance to acetolysis and solubility in sulfuric acid-hydrogen peroxide supports a conclusion that the outer wall contains sporopollenin. One of the functions of the outer cell wall may be protection from desiccation during prolonged dry periods.

THE BUTTON: NOT A SIMPLE NOTION

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Taken in its historical context, the button permits a unique insight into the transformation of American industry and technology from individual craft to high technology. There have been three phases in the evolution of button manufacture in North America.

The earliest phase dates from the Colonial period through the middle 19th century. Buttons were produced by craftsmen, or by tailors and seamstresses who designed them to accent the attire of individual customers.

The second phase had its origins in the War of 1812, but was given its major impetus by the Civil War. The accumulation of large numbers of chest and arm measurements necessary to fit soldiers for uniforms made possible proportional systems upon which the ready-to-wear clothing industry was founded. The success of ready-to-wear created a demand for mass produced buttons. This demand was met with the introduction of a new raw material, vegetable ivory (the nut of the Tagua Palm, Phtelephas macrocarpa), and by the organization of craft production in a factory system. The technology was basically mechanical employing saws, lathes, and drills in a subtractive process that reduced a nut to button blanks, and finally to a drilled and polished product. In this second phase button factories were generally established in proximity to the clothing manufacturers. Buttons as items of material culture had now taken on a life of their own as button designers were no longer directly involved in clothing manufacture.

The third and final phase has involved a revolutionary transformation. The production of vegetable ivory buttons was a labor intensive process. Following World War I labor costs had begun to rise. Perturbations in the supply of vegetable ivory (including revolution in Ecuador in 1912), as well as rising costs were forces for a change to a new raw material and capital intensive technology, plastics. Rochester's button industry is the focus of discussion of the second and third phases.

HYBRIDIZATION AND INTROGRESSION OF ACER SACCHARUM AND ACER NIGRUM.

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Two sugar maples and intermediate forms can be found at Fall Brook Ravine, about one mile south of the campus, Acer saccharum Marsh, is the dominant tree on the upland rim and on the slopes of the ravine. In the broad open area of the lower ravine "black" sugar maple grows. The black maple has been considered a separate species (A. nigrum Michx.) or as a variety or form of A. saccharum. In the mesic bottom land and lower slopes the intermediates are found.

The study sought morphological characters which would identify the parent populations. The characters also were used to calculate a hybridization index to show introgression. Leaf characters were selected

after a search of literature and preliminary trials.

One season's foliage was collected and studied in the hybrid area of Fall Brook, and observations were extended to herbarium specimens from the Genesee Valley region, and from mid-western states.

Typical black maple is found in more open areas than the common sugar maple, both in the microcosm of Fall Brook Ravine, and throughout the species ranges.

Tentatively, the described varieties of sugar maple appear simply to be among the many shades of hybrids. Future work will be directed at determining the relationship of all forms within the botanical taxa of species, sub-species, varieties, or forms.

THE GAUSS MARKOV THEOREM FOR ALTERNATIVES TO LEAST SQUARE ESTIMATORS.

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The Gauss Markov theorem (GM) states that the ordinary least square estimator OLS is minimum variance unbiased estimator (MVUE). This theorem also holds true for a class of weighted least square estimators that include the various ridge and contraction estimators as special cases.

SyS/ARCH: A USER FRIENDLY DATA PROCESSING SYSTEM FOR ARCHAEOLOGY.

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Computers are used in many areas of scientific research and have great potential to assist in data processing, particularly in the field of archaeology. A review of existing computer systems in this field shows, however, that many systems are unnecessarily complicated to use, often requiring additional knowledge in the field of computer science. Other systems suffer from being overly simplistic, sacrificing the extensive features and analysis of materials that more complex systems offer. The SyS/Arch - Archaeological Processing System is designed for use by the professional who would rather do field work than read computer manuals or spend hours behind a computer screen. The SyS/Arch system permits in-field coding of archaeological materials, and includes advanced processing options such as graphic site and quadrant maps, depth analysis, site catalogs and other programs to enhance the understanding of archaeological data. Custom listings can, easily, be generated on many finds such as stone tools and pottery, or on a single type of find such as Bare Island points. Sys/Arch is designed to accommodate most prehistoric field operations with 5' x 5' square quadrants, but can be modified for metric excavation. SyS/Arch includes an extensive verification system, increasing the accuracy of all data being recorded, and will retrieve, analyze, produce reports, graphs, and maps much faster than any traditional technique.

E. A. Hinkelman, University of Rochester

ABSTRACT

I present the PAIR program, which is a part of the perception module of a cognitive modelling system being built by Sergei Nirenburg and James Reynolds of Colgate University. This program simulates visual recognition of physical objects, given an object's components and their spatial relations, and a list of object type descriptions. The list may be either input directly by the user or result from a search of a knowledge base. The language used to represent objects is described, as is the structure and behavior of the program.

FACTORS INFLUENCING THE INITIATION OF ROOT SPROUTS IN AMERICAN BEECH (FAGUS GRANDIFOLIA EHRH). Robert H. Jones, and Dudley J. Raynal. Department of Environmental and Forest Biology, College of Environmental Science and Forestry, State University of New York, Syracuse, New York 13210

Throughout its range in New York State, American beech is encountering the beech bark disease. Larger stems are often killed resulting in the release of root sprouts of disease susceptible stock. A better understanding of vegetative reproduction in beech is needed if the regeneration of disease resistant stock is to be favored over the regeneration of susceptible stock. This presentation reviews a 3 year study of beech root sprout ecology and biology.

In a pilot study to characterize root sprout demography and spatial distribution, 22 isolated adults growing in mature northern hardwood stands were chosen as plot centers for 24 X 24 m plots. All sprouts and seedlings in the plots were excavated to a depth where seed vs sprout origin could be determined. Height, height growth, age, depth of origin, size of parent roots, grid location, and several other measures were recorded for all sprouts. First year results indicate that all newly initiating sprouts are derived from callus tissue on woody roots near the boundary of the mineral soil and the surface organic layer. Age class distributions reveal that sprout production in each genet is periodic and that the number of newly initiated sprouts is uncorrelated to the vigor of the parent. Sprouts are concentrated in a zone 0-5 m from the parents while seedlings are found throughout the 24 X 24 m plots.

To sort out the influence of environmental and physiological factors on sprouting, an experimental manipulation of 648 woody root segments in situ was initiated in the summer of 1983. A factorial design with two locations, 3 treatments (scraped, severed, and control), 2 exposure levels (exposed and reburied), 3 seasons, and 3 replications was used. First year results indicate that plant growth regulators (possibly auxins and cytokinins) are primary factors in sprout, bud, and new root initiation in treated roots. The micro-environment of the root may act as a factor of secondary importance.

AN ERROR TRAPPING STRATEGY FOR MICROCOMPUTER PROGRAMMERS. Bhairav D. Joshi, Department of Chemistry, State University College, Geneseo, NY 14454.

Interactive educational programs often require input of numerical data by the user. This input must be in a form acceptable to the program, otherwise it will not run. Poorly thought out programs will simply display messages like "RT Error" or "Invalid Input" when an input error is encountered, and just stop. To avoid such situations programmers need to thoroughly analyse the nature of the run-time input information, and develop error trapping programs to warn the user of all input errors detected. The user should be given another opportunity to enter correct input. Discussed in this paper are the strategies we have used to detect run-time errors in numeric input, integers and/or reals, and to warn users of such errors without exiting from the main program.

All numeric input consists of symbols taken from this set of characters, <+-0123456789E.>, and grouped together according to well defined rules [1]. These rules for forming integers and reals can be used to develop an algorithm to check the correctness of numeric input.

We collect all numeric input, ignoring all blank characters, in the form of a character string. It is then scanned to see if it obeys the rules for forming integers (or reals). If errors are detected during this process the entire string is displayed and all errors in it are flagged. A warning message is also displayed, and the user is asked to reenter the correct number. If no errors are detected by the scanning program, the input string is converted into the corresponding integer (or real) number, and saved for use by the program.

Our algorithm is coded in APL, and consists of four functions. ISCAN scans an unsigned integer string for errors, SISCAN scans a signed integer string, ZSCAN scans an unsigned real string of non-exponential type, and SZSCAN scans a general signed real string for any input errors. Examples will be given during the presentation of this paper.

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[1] American National Standard Programming Language FORTRAN, ANSI X3.9-1978, p. F27-F28, American National Standards Institute, New York, NY, 1978.

WESTERN NEW YORK STATE CONTRIBUTIONS TO THE FOUNDATIONS OF ANTHROPOLOGY. Russell A. Judkins, Ph.D., Anthropology Department, SUNY College, Geneseo, New York 14454.

Rochester, the Genesee country, and Western New York State in general have all made unique and substantial contributions to the development of Anthropology, especially Ethnography, Ethnology, and Social Anthropology Whereas Lewis Henry Morgan, Major John Wesley Powell, and others from Western New York State have recognized places in anthropological history, others, such as Ely Parker

and Arthur C. Parker have perhaps not been accorded the general recognition they deserve. In fact, the Native Peoples of Western New York State are an inadequately recognized stimulus and agency in the development of scientific Anthropology. The early development of anthropological work in America can be seen as being significantly influenced by Iroquois intellect and contribution, as well as by Iroquois-White interaction in Western New York State, in a manner profoundly important, though not generally recognized, even within the field.

ESTABLISHMENT OF PERMANENT VEGETATIONAL TRANSECTS ON THE MACINTYRE RANGE, ADIRONDACK MOUNTAINS, NEW YORK. E. H. Ketchledge and Brian T. Fitzgerald, SUNY College of Environmental Science and Forestry, Syracuse, NY.

Long-term studies of vegetational stability under postulated environmental stresses require permanent study plots. We have established eleven permanent transects above timberline on the MacIntyre Range to provide the initial data base for monitoring floristic and vegetational shifts over time in the alpine environment of New York State, an area now subject to acid rain impact.

Our transects are each 30 meters long and are identified at either end with a 1" steel eyebolt epoxyed into a 1"-deep socket excavated in the anorthosite with a star drill. Both end points are referenced by distance and azimuth from the elevational summit, in some cases with intermediate numbered reference bolts also anchored in the bedrock.

Transects were read by a point-intercept method at 5 cm intervals, recording the first plant seen in the vertical projection downward from the edge of the steel tape stretched over the canopy of the vegetation.

Transects were located to show a variety of vegetational conditions, from the Carex/Sphagnum meadow at the moist end of the theoretical moisture spectrum to the Vaccinium/Cetraria heath on the drier slopes. All transects were located in outwardly stable vegetation essentially free from recreational traffic and despoilment.

Three transects are positioned on the summit dome of Wright Peak, 1398 m (4585 ft) elevation with 5.5 acres above timberline; three on the high meadows of Algonquin Peak, 1559 m (5114 ft) elevation with 21.6 acres above timberline; two on Boundary I, 1472 m (4828 ft) elevation with 3.4 acres; and three on Iroquois Peak, 1478 m (4848 ft) elevation with 4.6 acres above timberline.

Next summer we plan to put more lines (1) over perturbed spots in order to evaluate seral and pioneering species and (2) near timberline to record invasion of boreal species from the krummholz transition zone.

Color transparencies will be shown and intercept data discussed.

"HORTICULTURAL ART JOURNAL" (1886-1891), AN EARLY ROCHESTER PUBLICATION. Lawrence J. King, Biology Department, State University College, Geneseo, N.Y. 14454.

The Journal was issued for six years, and only volume five (1890), under the "editorial management" of Thomas P. Jenkins (1835-1898), has been available for study (copy, Rare Book Room, U. of R. Library). Jenkins arrived in Rochester from England at 18 years of age (1854) and worked for the famed Ellawanger and Barry firm "as an expert nurseryman." Later he worked for the Stecher Lithographic Co. of Rochester. He also appears to have had his own nursery at 4 East Park (Rochester Business Directory, 1885). The Journal is unique in having no advertising. This may be due, however, to the fact that the publisher, Stecher Co., included color and black-and-white full-page plates. Thus, examples of their work were displayed. The first "color photographs" were included in this volume (No. 4, opposite p. 32)-- a black-and-white photo was overlaid with color printing. Almost no line drawings appear. The company's logo first appears on the beautiful Tecoma radicans (trumpet vine) plate (Oct., 1890, opposite p. 96). See the history of Stecher in K. Kabelac article, U. of R. Library Bull., 35 (2), 103, 1982. Included there is a color reproduction of a "nurseryman's plate", "Jesse strawberry" by Stecher, with some size exaggeration (p. 104).

The Journal was "devoted to the interests of nurserymen, seedsmen and rural homes." The subscription was $2.00 per year for five parts, and included only "illustrations of new and deservedly popular subjects from the orchard, garden and greenhouse." "Several eminent horticulturists and pomologists have been arranged with and agreed to write for each issue of the Journal." The Stecher firm was valued highly for its color plates, as in 1890 it "received a contract from the U.S. Government for over four million color plates for use in the forthcoming report of the Secretary of Agriculture."

An extensive article with a full-page portrait reviews the life and work of the late Patrick Barry (1816-1890), pp. 53-56. Also included were memorial letters, with one from George Ellawanger (pp. 58-59). Other articles of note are; a full report of the Western New York Horticultural Society meeting (1890), pp. 5-12; 19-20;"Rochester Parks,"which includes a long letter of Mr. Ellawanger about his gift of land (pp. 83-84); "California evaporated and dried fruits," by Mr. Perkins of C.H. Perkins & Co. of Newark, N.Y.; "Tree Agent," unsigned, examines fraudulent sales to home owners; and an exerpt from "The Garden" on "Pomological Illustrations" praising those in C.M. Hovey's, "Fruits of America" (1851) for accuracy of fruit size and coloration.

Thomas B. Jenkins died at age 63 on Feb. 9, 1898 (Rochester Democrat and Chronicle, Feb. 10, 1898).

PARTITION COEFFICIENTS AND THEIR IMPLICATION TO ELEMENTAL ZONATION AT NEWRY, MAINE, by Vandall T. King, P.O. Box 90888, Rochester, New York 14609

Partitioning is an important process in differentiation of igneous bodies. In the main (granitic) pegmatite sheet on Hall's ridge, Newry, Oxford county, Maine, elemental and mineralogical zonation has been thoroughly investigated (Shainin and Dellwig,1955;King,1975,1980). Mineralogical zonation is apparent in at least six zones exposed in the Nevel quarry. The Bell pit is unzoned. Drill core of the pegmatite's flank, obtained from the USBM, proved to be cryptically zoned (King,1980). The cryptic zonation is strongly positive for

Li and Rb and largest in the upper ½ of the pegmatite. A similar strongly negative zonation was found for Mg which correlated with the positive Li and Rb trends. Interspersed in the mineralogically unzoned pegmatite flank are various aplites.

If the aplites are assumed to be representative of the composition of the magma chamber and, in essence, are a quenched portion of it, the various partition data for rhyolitic and basaltic liquids can be interpreted in relation to these aplites. The aqueous silicate-fluid with strongly positive liquid-liquid and crystal-liquid partitioning concentrated and captured the the rare elements in the upper pegmatite sheet. Lithium and rubidium actual abundances increased by a factor of ten over initial values while magnesium decreased by a factor of ten.

Important adjustments occurred in the very Li and Rb enriched upper part of the sheet. Very low Li/Na_2O, by a factor of 2 and greater, values are found superimposed on otherwise rational enrichment trends. The ratio Li/K_2O varies by almost 1000, while Li/CaO approaches a change of 10,000. Major elements K_2O/Na_2O vary by 2-8. In each case of strongly fluctuating, closely-spaced, alkali and alkaline earth ratios, the more soluble-in-aqueous-fluid element is depleted. Each fluctuation superimposed on a definable enrichment trend is reversed when the sample is aplite. The implication is that fugitive water vapor, having evolved via two-phase separation of silicate liquid principles, partitioned those elements which were more soluble in a water-rich phase, left the system via fractures and re-set the crystallization pathways.

USE OF SEGMENTED SPACE IN THE MAYA LOWLANDS: A LANDSCAPE APPROACH.

Ellen R. Kintz, Department of Anthropology, SUNY College, Geneseo, NY 14454

In the Yucatan Peninsula, southern Mexico, traditional curing practices have been reported since contact was made with the Spaniards in the sixteenth century. Diego de Landa reported on the utilization of plants for curing and ritual by the lowland Maya in conquest times. Modern studies by Lundell, Roys and Steggerda focused on ethnobotanical classification of the flora by the Maya. Most recently, Barrera Marin and others have provided additional information on the use of tropical plants of the Yucatan Peninsula including their scientific nomenclature. The traditional health practitioners, yerbateros (herbal curers) and h-men (traditional Maya priests), continue to collect, prepare and apply plants in curing various physical and mental maladies. The collection of medicinal plants and other socially and economically important species reflects the use of segmented space in the Maya lowlands. Medicinal plants are found in solares (yards), in the pueblo (town), in milpa, canada (abandoned milpa), alcalche (wooded swamp), monte bajo (low rain forest) and in monte alto (high rain forest). These are segmented ecological zones traversed by the Maya milpero, yerbatero and h-men. The model presented provides a strategy for a deeper understanding of the relationship between Maya culture and the environment they exploit.

FIELDWORK AS A FONCTIONNAIRE: AN ANTHROPOLOGIST IN INTERNATIONAL DEVELOPMENT. James A. Knight, Tufts University, Medford, Massachusetts 02155

When anthropologists work in applied settings, such as International Development, they are often De Facto Government Officials--Fonctionnaires in important implications, both in regard to the pragmatic aspects of field research and in the regard to the paradigm of fieldwork itself. This paper presents an analysis drawn from two years of fieldwork as a contract anthropologist for an American-Funded Livestock Development project in Niger, West Africa.

IN OVO AND IN VITRO CULTURE OF THE DIGENETIC TREMATODE AMBLOSOMA POJMANSKAE FISCHTHAL. S.A. Kochik and C.E. Vasey, Biology Department, SUNY College of Arts and Science, Geneseo, NY 14454.

In 1971 an unidentified unencysted metacercarial stage of a digenetic fluke was first isolated from the oviducts of Viviparus georgianus (Lea), a snail found in Conesus Lake, Livingston County, New York. Fischthal (1974) determined this to be the metacercarial stage of an undescribed species of Amblosoma (Trematoda: Brachylaimidae). He named the new species A. pojmanskae and used the metacercarial stage as the basis for the original description. Up until the time of the present studies, the appearance of the adult stage was unknown.

During our investigations, living, unencysted metacercariae were successfully grown to the adult stage on the chorioallantois of chicken eggs, following the methods of Fried, et al. (1973, 1980, 1981). While both in Ovo and in Vitro techniques were attempted, the latter proved to be less satisfactory for our purposes. A description of the adult stage of A. pojmanskae is given for the first time.

THE CHARCOAL IRON INDUSTRY AND FOREST ALTERATION: THE NEW YORK-NEW JERSEY HIGHLANDS, 1750-1850. Theodore W. Kury, Department of Geography and Planning, State University College, 1300 Elmwood Avenue, Buffalo, New York 14222

Geographers have long held an abiding interest in humankind's changing relationships with and impacts upon the natural environment. Prior to the Industrial Revolution, economic endeavors depended upon readily available natural resources and their utilization led to permanent settlement and landscape alteration. The charcoal iron industry of the eighteenth and nineteenth centuries was a case in point.

This paper will attempt to reconstruct the extent and character of the pre-European vegetation cover of the Highlands so as to provide a foundation for dis-

cussion of the impact of a century of human exploitation of the forests. The environmental attributes necessary for the establishment and sustenance of charcoal iron manufactories will be presented. Central will be reviews of human perceptions of the forest as a natural resource and an analysis of timber use in the mining and manufacturing of iron. The distinct cultural landscapes which evolved and the consequences of human activities on the extent, composition and regeneration of the forest are delineated.

THE ALLELOPATHIC EFFECTS OF HELIANTHUS TUBEROSUS ON SEED GERMINATION. E.P. McDonald, A. Reid, Biology Department, SUNY College at Geneseo, NY 14454.

An extract made from the leaves of Helianthus tuberosus was tested for allelopathic properties. The extract was applied in different concentrations to seeds of Queen Ann's Lace, Elecampane, Radish, Box Elder, and Peas to observe its effects on the amount and rate of germination. The results, when compared to the controls revealed a definite inhibition in the germination of most seeds tested, which increased with greater extract concentration. A delay in germination rate was also observed, further suggesting that this species possesses allelopathic qualities.

HABITAT USE BY FISHES AT AN ARTIFICIAL REEF IN SOUTHWESTERN LAKE ONTARIO.
Glenn D. Merritt, John E. Gannon: Dept. of Environmental and Forest Biology, Illick Hall, S.U.N.Y. Coll. of Env. Science and Forestry, Syracuse, NY 13210

Lake Ontario's first artificial reef, near Olcott, New York, was assessed for its use by fish. Various methods such as gill netting, SCUBA, and benthic sampling were employed to compare the artificial reef with two other closely situated sites: a natural shoal, and a cobble area of no vertical relief. This discussion will emphasize results concerning abundances, obtained from experimental gill nets which were set on 14 occasions from May through October 1983. These results support the contention that vertical relief plays a role in attracting warmwater fish.

MICROCOMPUTER-BASED GEOGRAPHICAL INFORMATION SYSTEM SOFTWARE FOR DIGITAL REMOTE SENSING.
T. Miller, and R. Lougeay, Dept. of Geography, State University College, Geneseo, New York 14454.

Interactive software for geographic information system analysis, designed in Applesoft basic for Apple II microcomputers, has been developed. Originally

intended to augment the capabilities of microcomputer-based digital image analysis, these computer routines will enhance instruction in several undergraduate Geography courses and provide a valuable research tool. Reference data of known land use, land cover, or other spatial parameters are entered into a 1600 cell matrix. This matrix may correspond to pixels of remotely sensed data, or other user-identified study cells, A 40 x 40 array of cells was chosen to match the Apple low resolution graphics capability, but an expansion of this matrix can be made using high resolution graphics. Classified data can be compared to the reference data on a cell-by-cell basis. Analysis output provides a compilation of the number of corresponding cells, a percentage error for each class of data, and an overall accuracy value. This software package provides a powerful tool for geographers with little background in digital mapping, and requires relatively inexpensive, fairly ubiquitous, microcomputer hardware.

RAPTOR MIGRATIONS AT BRADDOCK BAY, ROCHESTER, N. Y.
Neil S. Moon, Laura W. Moon, 25 Edgewater Lane, Rochester, N. Y. 14617.

Braddock Bay, an indentation on the south shore of Lake Ontario, about 10 miles NW of Rochester in the Town of Greece, is the site of an outstanding spring hawk lookout. It has been manned on a daily basis from late February through 30 June for the past 7 years, from 1978-1984; and in 1977, on 49 days. The authors were the principal observers, assisted by members of local bird clubs. The average number of raptors per year over the 8 years is 36,588; the peak count was 63,295 in 1984. This eastward migration along the south shore of Lake Ontario was described by Eaton 81 years ago. A very small ill-defined migration occurs in fall.

The 15 species seen every spring are Turkey Vulture, N. Goshawk, Sharp-shinned Hawk, Cooper's Hawk, Red-tailed Hawk, Red-shouldered Hawk, Broad-winged Hawk, Rough-legged Hawk, Golden Eagle, Bald Eagle, N. Harrier, Osprey, Peregrine Falcon, Merlin and A. Kestrel.

When raptors fly north in the spring, the lack of thermals over the cold waters of the Great Lakes forces them to fly around the lakes. Thus, when there is a strong SW wind and rising temperatures, they are heavily concentrated along the south shore of the lake. These conditions most often occur when a low pressure system passes north of Rochester. On a big migration day thousands of raptors fly over Braddock Bay in a steady stream going east. The greatest number of raptors, mostly Broad-winged Hawks, go through in the last 10 days of April and the first week of May. On some days raptors fly at low altitude from only a few feet off the ground to several hundred feet high. On

days when there are strong thermals, they sometimes fly so high they can be seen only with binoculars.

With adverse winds having an easterly component, the line of flight may be pushed inland, and it is necessary to have observers at auxiliary sites in order to monitor the complete migration.

Comparison of our data with similar observations made in 1949 and 1950 by Wolf, Listman and Bieber show some important changes: an increase in total numbers, and increases and decreases in certain species. The increase in total numbers is believed to be due to better observer coverage at auxiliary sites, and not necessarily due to an actual increase in total raptors.

A SEARCH FOR IROQUOIS ORIGINS: THE DEVELOPMENT OF IROQUOIS CULTURE IN THE GENESEE. Mary Ann Palmer Niemczycki, Research Division, Rochester Museum & Science Center, 657 East Avenue, P.O. Box 1480, Rochester, New York 14603

The study of prehistoric settlement patterns and ceramic stylistic trends has linked the historic Seneca to local antecedents in the Bristol Hills, along the Canandaigua Outlet, and to the east of Cayuga Lake. However, Seneca antecedents cannot be identified within the Genesee Valley which has long been considered a center of Iroquois development out of earlier Owasco culture.

This paper describes the "Search for Iroquois Origins" in the Genesee Valley which is being conducted through the Research Division of the Rochester Museum and Science Center. To date, this investigation has involved the reexamination of existing data on ceramic and settlement patterns from the Genesee, as well as the excavation of two Owasco sites located near Avon, New York.

The results of this investigation indicate that the inability to link cultural developments in the Genesee Valley to the rise of Seneca Iroquois culture has been largely due to a lack of systematic archaeological excavation in this region and the acceptance of faulty assumptions which have led to a misinterpretation of available data. In conclusion, new criteria for the cultural identification and temporal placement of sites will be proposed and used to construct a cultural sequence for the Genesee Valley A.D. 1000-1400, and to describe Iroquois development in this region.

HOW A RESTAURANT CHAIN 'GOES NATIONAL': THE CASE OF DENNY'S.
Darrell Norris and Mark Froelich, Department of Geography, S.U.C. Geneseo, Geneseo, N.Y., 14454.

Successful regional restaurant or motel chains sometimes aspire to nationwide representation. A common strategy to achieve this goal is to build from a strong regional base by gradual expansion into successively more distant markets. This strategy, which can be described mathematically as a regular contagious diffusion process, was adopted by Denny's in its spread from a Los Angeles area base between the 1950s and early 1980s. The restaurant

industry, however, is also acutely sensitive to sales barriers and opportunities. A multiple regression model of Denny's locational strategy reveals the role of income variations, national travel patterns, and the overall pattern of the food and lodging industry as apparently influential factors in one company's representation on America's highways.

VERNALIN PRODUCTION IN Daucus carota.

Steven M. Pomeroy
60 Stewart Drive
Rochester, New York 14624

The production of the hypothetical flowering hormone vernalin within Daucus carota cell suspensions was assayed for. The D. carota cells were cultured in Murashize-Skoog liquid media; the cell suspension cultures were vernalized at a temperature of five degrees celsius.

Qualitative assays were used to test for the presence of vernalin: 1) Chromatographs of vernalized cell suspension extract (vcse) and room temperature treated cell suspension extract (rtcse) were made. 2) Development of macrocallus was studied for cold temperature, room temperature, and cold temperature/room temperature treated cell suspension cultures. 3) The effect of vcse, autoclaved vcse, and gibberellic acid present within liquid embryogenesis media (in which D. carota embryoids were cultured on filter paper bridges) on plantlet development was investigated; the effect of vernalization temperature on plantlet development was also investigated. 4) Absorbance spectra of vcse and rtcse were compared. 5) Bioassays for gibberellic acid were performed for both vcse and rtcse. 6) The effectiveness of gibberellic acid, rtcse, vcse, autoclaved vcse, and gibberellic acid + vcse on D. carota development was investigated. 7) The effectiveness of vcse and gibberellic acid on vernalized D. carota development was investigated. 8) Room temperature treated and vernalized cell suspension cultures, treated with vcse, were subjected to conditions which initiated embryogenesis; plantlet development was allowed to proceed and was studied.

The results showed that: 1) A substance was present in the vcse, but was absent in the rtcse. 2) Macrocallus developed in the cell suspensions cultured at room temperature, but did not develop in the cold treated or cold treated/room temperature treated cell suspension cultures. 3) The vernalized embryo cultures and the embryo cultures treated with vcse showed very poor plantlet development; the other embryo cultures showed very good plantlet development. 4) Absorbance spectra showed a different absorbance peak for the vcse than that of the rtcse. 5) Gibberellic acid did not seem to be present in the vcse or the rtcse. 6) D. carota growth rate was altered differently with each treatment. 7) Vernalized D. carota growth rate was altered with each treatment. 8) Flower initiation occured in cultures previously treated with vcse (at the preembryonic stage); both the vernalized and the room temperature cultured cell suspensions, after plantlet development took place, had developed flowers.

THE USE OF THE ETHNOGRAPHIC ATLAS IN TEACHING ETHNOLOGY. John Rhoades, Department of Anthropology, St. John Fisher College, Rochester, New York 14618.

The Ethnographic Atlas is a listing of the manner in which 60 sociocultural variables are manifested in 862 of the world's societies representing 412 culture types. It is a highly abbreviated version of the Human Relation Area File's presentation of over 700 variables, but as an inexpensive and portable summary of world cultures it is a useful part of an ethnologist's tool-kit. Based upon his experience using the Atlas in an undergraduate course on ethnology, the author presents some problems in its use by students beginning their study of cross-cultural comparisons. Foremost among these is appreciating the artificiality of presenting a sociocultural system as a series of discrete characteristics, understanding the dense conceptual interrelationships which underlie each variable, and having the necessary statistical background to manipulate the information in the listings. With careful supervision of its use, however, beginning students are able to profitably use the Atlas.

ANTHROPOLOGY AND ETHNICITY IN THE CLASSROOM: DEVELOPING RESOURCES FOR MULTICULTURAL EDUCATION. Sue N. Roark-Calnek, Department of Anthropology, SUNY College of Arts & Science, Geneseo, New York 14454.

This paper reports on some issues in the presentation of ethnic identity emerging in work with multicultural education programs in the Rochester area. One program developed resources on the cultural heritage and present status of Haitian, Native American, and other ethnic groups in the migrant farm labor stream; the second sought to link mainstream classroom instruction with after-school Native American heritage education programs. In designing instructional resources and strategies for multicultural education, it is important to take into account the social structural context in which such programs will function, some relevant dimensions of this context are identified and discussed with examples.

MONKS, MASONS AND ARCHAEOLOGISTS: THE EXCAVATION OF A STONE BEEHIVE STRUCTURE IN NEW ENGLAND. Richard Rose, Department of Anthropology, Rochester Museum & Science Center, 657 East Avenue, Rochester, New York 14603.

During the past three decades there has been speculation and controversy concerning the origins and function of certain corbel-vaulted, subterranean stone structures located in the hill country of central New England. Locally called "stone beehives" due to their resemblance to the dome-shaped beehives once common in New England, the structures are also known as Monk's caves, root cellars, hunting cubbies

and other names that reflect the various speculations as to their intended function. Stone beehives have been cited by some as proof that North America was discovered and colonized by Bronze Age Europeans at least 2,000 years before Columbus. It is argued that this extreme view is not only erroneous but also racially prejudiced against the indigenous peoples of North America.

The archaeological excavation of a typical stone beehive in Petersham, Massachusetts, has demonstrated that the structure could not have been built prior to the Colonial Period and was probably constructed after A.D. 1750. The resemblance of the New England stone beehives to similar structures in Ireland is explained in terms of the structural constraints of stoneworking technology and cultural patterning.

Archaeological evidence suggests that the Petersham stone beehive has used as a springhouse providing fresh water and a constant-temperature environment for the storage of perishable foodstuffs. It is likely that the underground structure also functioned as a hiding place from hostile Indians.

DESIGNING A GLUCOSE SENSOR. Terry S. Ruhl, Irmgard K. Howard, Houghton College, Houghton, New York 14744.

Glucose inhibition of lectin-polysaccharide precipitation was investigated as a potential system upon which to base a blood glucose sensor. Although several systems were tried, the most promising combination appeared to be the lectin, concanavalin A, and the polysaccharide, oyster glycogen. By absorbance decrease at 420 nm, glucose inhibition of the precipitation was linear over the glucose concentration range normally found in blood. The reaction was reversible and unaffected by physiological levels of urea and ascorbic acid, potential interfering agents. Among questions remaining for investigation are other possible sources of interference and the long term stability of the system.

STATUS STABILITY AND ROLE FLEXIBILITY: TIRIKI, KENYA, AGE GROUPS TODAY. Walter H. Sangree, Department of Anthropology, University of Rochester, Rochester, NY 14627.

Research in Tiriki in 1954-6, and 1982, reveals the continuing practice and importance of initiating young males into a graded system of semi-generational age groups. This paper analyses how and why members of the two seniormost "elder" age grades still enjoy the highest tribal social status even though they have largely forsaken their traditional judicial and ritual roles and instead have assumed many domestic and subsistence supervisory roles now left unfulfilled by junior age grade members who are working for cash in distant urban centers.

THE HUMAN IMPACT OF A PET THERAPY PROGRAM IN THREE NURSING HOMES. Joel S. Savishinsky Department of Anthropology, Ithaca College, Ithaca, NY 14850.

A pet therapy program for nursing home residents, run by community volunteers and college students, has been the focus of an anthropological study since 1982. A number of unintended social effects have been identified in the program's operation. The styles of interaction found among people, and those occurring between residents and pets, vary with the distinct types of visiting format used at each facility. The group visits held at some homes produce more prolonged but less private encounters than the one-to-one format followed at other institutions. At all the facilities studied, animal sessions trigger reminiscing patterns focused on the residents' childhoods and their experiences of pet loss. Some elderly people participate mainly to relate to humans rather than animals. We found that certain patients tend to perceive pets as sources of moral value: they use their presence to assess human qualities and their own treatment by others. Program volunteers also develop intense, on-going bonds with residents, whose emotional demands they sometimes find difficult to meet. Human bonding thus proves to be a rewarding but sometimes painful feature of a program based primarily on the ties between people and pets.

LABORATORY STUDIES CONCERNING THE EFFECTS OF COLD-SHOCK ON RAINBOW TROUT, Salmo gairdneri. Paul M. Sawyko, Rochester Gas and Electric Corporation, 89 East Avenue, Rochester, NY, 14649.

Fish residing in the thermal plumes of power plants may be subjected to large and rapid decreases in water temperatures should the power plant be shutdown. This situation is termed "Cold-Shock" and may cause loss of equilibrium and/or death to the species involved. This study is another phase of a program to explore the cold-shock phenomenon as it relates to RG&E on Lake Ontario. Whereas previous work has focused on field testing of species collected from the Ginna discharge canal on Lake Ontario, this laboratory study was designed to allow more controlled test conditions, as well as to explore differences found between field results and previously reported laboratory findings.

In the lab, fingerling rainbow trout were acclimated to 10°C or 15°C and then immediately transferred into water temperatures of 0.5°, 1.0°, 2.0°, or 3.0°C where they were held for a minimum of 96 hours and observed for survival. Of the eight test conditions studied, only the 15° to 0.5°C test resulted in mortalities, with 60% of the fish dead at the end of 96 hours. The remaining 40% of the fish in the 15° to 0.5°C test, although alive, were unable to maintain themselves in the water column and showed severe loss of equilibrium. In the 15° to 1.0°C test, 50% of the fish were swimming normally while the remaining 50% showed definite loss of equilibrium and/or remained on the bottom. All other test conditions resulted in normal swimming ability with only slight loss of equilibrium noted in some cases.

In similar studies previously reported in the literature, 96-hour TL_m values for 15°C and 10°C acclimated fish were 1.4°C and ~0.5°C, respectively. In the present study, 96-hour TL_m values for 15°C would be slightly above 0.5°C, and for 10°C would be below 0.5°C since there was 100% survival in the 10° to 0.5°C test. Previous field studies on adult rainbow trout showed no mortalities for fish acclimated in the 11° - 14°C range and placed in 0.5° - 0.6°C water. Overall, the present study supports the field results in that survival for fish placed in 0.5°C water would require acclimation to temperatures between 10° and 15°C.

INDIVIDUAL AND MATE RECOGNITION IN THE YELLOW WARBLER (DENDROICA PETECHIA).

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A field study of the Yellow Warbler(Dendroica petechia) was undertaken for the 1984 breeding season. From May 10 to July 11 recordings of song were made for 9 warblers, most males holding territories at Mendon Ponds Park, Mendon, NY. Seven playbacks were performed for each bird, including self, neighbor, stranger and mate, where possible. Behavioral responses as well as vocalizations were recorded. Preliminary results are presently inconclusive but show an apparent trend toward an elevated response of the male to the neighbor or self song. Stranger song apparently initiates a vocal or behavioral response toward the neighbor instead of the speaker. Playbacks of female vocalizations to various males shows an elevation in singing rate by the males.

Plants Children Eat: A Study of the calls to the Rochester Poison Control Center.

M. F. Schneider, LifeLine and Rochester Academy of Science.
412 Woodland Lane, Webster, N. Y. 14580.

The possible toxicity of plants has been the subject of an ongoing study since 1960, at first by telephone, then with a questionnaire mailed to each caller. The number who respond has been gratifying, and added immeasureably to our knowledge.

Plant calls have increased from 96 in 1962 to 1507 in 1982 and averaging almost 10% of the Poison Control Calls. Outdoor plants (ingested mainly by the 2 to 5 year olds) account for the greatest number, peaking during the fruiting season; indoor plants, rising sharply with the introduction of 'hanging' plants, sampled in 1962 by 9 month old infants and older are being explored now by even 4 months old infants. Adults, in sampling wild foods, and using 'herbal' teas, increasingly ask our help.

We have discovered that some plants listed by many authors as having a part that is toxic (i.e. Iris rhizome) contain the toxin in other parts (stem, leaf); that Poinsettia is poisonous to touch and/or eat, at least to some individuals. Although the public has become more aware of the potential danger in eating unknown plants, few have learned to know even our most common garden and wild plants.

There are some plants which we hear about each year: Daffodil, Jonquil, Narcissus (Narcissus spp.), Dieffenbachia, Hyacinth, Horsechestnut (Aesculus spp.), Ivy (Hedera spp., Senecio spp.), Jerusalem Cherry (Solanum pseudo-capisicum), Lily-of-the-Valley (Convallaria majalis), Nightshade (Solanum dulcamara), Philodendron, Privet (Ligustrum spp.), Yew (Taxus spp.), Holly (Ilex spp.), Poinsettia (Euphorbia pulcherrima), and many Mushrooms - all of these and many more potentially dangerous. Also the subject of many calls are the edible Mulberries (Morus spp.), Grape Holly, or Oregon Grape (Mahonia spp.), and Mountain Ash (Sorbus spp.); the non-toxic African Violet (Saintpaulia), Christmas Cactus (Zygocactus), and Honeysuckle (Lonicera spp.).

The Plant Consultant for the Poison Control Center when I became a volunteer in 1960 was Dr. Richard C. Hart (of Hart & Vick), and upon his untimely death in 1962 I succeeded him. A complete and detailed file of his records on poison plants was lost, but some of the information in my PLANTS POISONOUS TO CHILDREN AND OTHER PEOPLE is from him. Since the public knows plants by common name if at all, I have so listed them, with an index of botannical names. It is the reference used by our Councillors at the Center who now handle over 20,500 calls a year. Helping them in handling calls about snakes, insects, food items, as well as plants and mushrooms are volunteer experts who have cheerfully been on call for many years.

APPLICATION OF GENERAL PURPOSE SOFTWARE IN CHEMICAL EDUCATION

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Rochester Institute of Technology, Rochester, NY 14623

Microcomputers have not had an impact on classroom instruction in proportion to the investment made by educational institutions. The fundamental impasse has been the scarcity and expense of high quality instructional software.

The chemistry requirement for nursing and allied health students is one of the most difficult components of their education. Students have difficulty understanding concepts such as chemical equilibria and often fail to understand its correlation to physiological processes. One major obstacle is iterative calculations required to solve equilibria problems. Another is the level of abstraction required to make the correlation to biochemical processes in the body, e.g, acid/base balance and buffering capacity of body fluids. Problem solutions are often learned by rote or not at all.

As part of a project funded by the U.S. Department of Education to determine the utility of general purpose software, we are attempting to develop instructional applications that will foster active, participatory learning in the classroom while aiding

students in the mastery of basic concepts and enhancing problem solving skills.

In this paper we will discuss our initial attempts to use an electronic spreadsheet, such as Lotus 123, to model chemical equilibria as related to physiological outcomes. As students iterate through calculations, the process of equilibrium can be observed as a traditional chemical equation. The use of the Lotus 123 graphics package to plot the process of acid/base neutralization, as an example, can further reinforce understanding of this fundamental concept in chemistry.

TIMBER, CAVITY AND WOODPECKER FORAGING TREE MANAGEMENT FOR THE PRIVATE LANDOWNER.

Karl VonBerg, Rochester Museum and Science Center, 657 East Avenue, Box 1480, Rochester, New York 14603

In New York State over 80 percent of the forestland is privately owned. Increased fuelwood gathering and bird watching have created a new demand on the resources of these forests. Private forest landowners need to be aware of the impact their management has on cavity nesting birds which play an integral role in the life of a forest. The cavity nesting birds ability to help keep insect populations at endemic levels, as well as provide bird watchers with a recreation are important services of these birds.

Research done at Cornell University's Arnot Teaching and Research Forest and other studies has made information available on cavity nesting bird habitat in central New York State. Recommendations were compiled which suggest ways to manage for cavity nesting bird habitat and give forest landowners an assessment of the economic impact this would have on timber production.

A general method, which landowners without the resources or time could use, involved forestland $\geq$ 4 ha. Anywhere from 10 partially to totally dead trees per ha of atleast 20 cm dbh to 19 partially to totally dead trees per ha ranging from 10 cm dbh to 37 cm dbh need to be reserved. This will supply the needed cavity nesting habitat as long as selective cutting or patch clearcutting is employed to preserve the forest canopy.

The detailed methodology, which consulting foresters could use, involved inventoring the standing timber, calculating its value per ha and then assessing the cost (value of timber forgone) of reserving trees for a certain level of cavity nesting bird habitat. This cost ranged from $10 per ha for supporting downy woodpecker habitat at 40 percent of the population maximum to $150 per ha for supporting downy woodpecker, hairy woodpecker, pileated woodpecker, northern flicker and yellow-bellied sapsucker habitat at 100 percent of the population maximum.

MATHEMATICS AND ANTHROPOLOGY: THE GEOMETRIC SYMMETRIES OF CULTURAL PATTERNS. Dorothy K. Washburn, Department of Anthropology, University of Rochester, Rochester, New York.

Geometric symmetries can be used to systematically and objectively describe the arrangement of motifs in a design on patterns in the plane. Such repeated patterns are ubiquitous in culture, decorating such diverse media as tile, ceramics, wood, textiles, basketry, etc. Cultural groups seem to preferentially use just several of the 7 + 17 and 17 + 46 motion classes on the one and two color, one and two-dimensional designs respectively. In this paper I show the range of artifacts from different cultures which are decorated by these symmetries. I show how changes in design styles defined by their whole layout, rather than by the individual motifs, correlates with other changes in culture through time and space. Examples from turn-of-the-century California baskets, pre-Columbian pottery from the Ica Valley, Peru, and Neolithic pottery from Greece will be discussed.

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ROCHESTER ACADEMY OF SCIENCE, INC.
TWELFTH ANNUAL SCIENTIFIC PAPER SESSION
and
L.J. KING MEMORIAL LECTURE

"The Status of Rare Reptiles and Amphibians
in Western New York" by Alvin R. Breisch

at

MONROE COMMUNITY COLLEGE
ROCHESTER, NEW YORK
Chairs:
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NOVEMBER 2, 1985

ABSTRACTS OF PAPERS

OFFICERS, 1985-1986

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Russel A. Judkins, moderator

Panel Discussion: "Anthropology in Rochester and Western New York"

Featuring Representatives from
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SUNY Geneseo
Rochester Museum & Science Center
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ISOLATION OF POLYRIBOSOMES FROM MUNG BEAN SEEDLINGS. Julia R. Andrews, Valerie M. Kish. Department of Biology, William Smith College, Geneva, NY 14456.

Plant tissue is rich in endogenous ribonucleases. We report here a method for isolating polyribosomes containing messenger RNA that is not degraded. This messenger RNA will in the future be used in a cell-free translation system to define the proteins synthesized during development of seedlings of the mung bean (Phaselous aureus). A homogenate is prepared by grinding mung bean cotyledons in extraction buffer containing Proteinase K and cycloheximide. The post-mitochondrial supernatant (PMS) is isolated by differential centrifugation. The PMS is layered on a linear sucrose gradient and the majority of the polyribosomes are pelleted. The polyribosomes in the pellet are dependent on magnesium ions for their integrity. The polyribosome pellet is extracted with phenol-chloroform to remove associated proteins and the deproteinized RNA scanned (λmax = 258 nm) and characterized by sucrose gradient analysis. The latter reveals the presence of two peaks of material sedimenting at 28S and 18S in the gradient, indicating that intact ribosomal RNA is present. This purified RNA population will be fractionated into poly (A^+) messenger RNA and non-poly (A)-containing RNAs by affinity chromatography, the messenger RNA fraction will be translated in a cell-free system, and the resulting 35S-labeled polypeptides will be analyzed by polyacrylamide gel electrophoresis.

LIFE HISTORY AND PRIMARY PRODUCTION OF CLADIUM MARISCOIDES IN ZURICH MUD POND. John M. Bernard, Dept. of Biology, Ithaca College, Ithaca, N.Y. 14850, and Franz K. Seischab, Dept. of Biology, Rochester Institute of Technology, Rochester, N.Y. 14623.

Numbers and weights of old, young, and new shoots aboveground and root and rhizome weights belowground were determined for Cladium mariscoides during summer 1982. The shoot population numbered 1035/m^2 in May, approximately one-half were classified as old, one-half as young. By September only about 450 shoot/m^2 of the May shoots were still alive but almost 300 new shoots/m^2 had emerged, making the population then about 750 shoots/m^2.

Shoot standing crop was 81 g/m^2 in May and reached a peak of 224 g/m^2 in August, most contributed by shoots in the young category. Belowground, root and rhizome standing crops were 68 and 51 g/m^2 respectively at maximum and we estimate their production to be 47 g/m^2/year. Total production is estimated to be 275 g/m^2/year.

HIGH SOIL LEAD LEVELS AROUND HOUSES OF ROCHESTER CHILDREN WITH ELEVATED BLOOD LEAD LEVELS.
Heather Booth, 111 Genesee Park Blvd., Rochester, NY 14611

High lead levels in the soil around older houses constitutes an uncontrolled lead hazard to Rochester children. High amounts of lead were found in the soil surrounding houses of children that had excessive lead in their blood. Soil was examined because the source of bad exposure of the children had never been identified. The houses were inspected for interior and exterior lead hazards and found to be hazard-free. Soil in the yards where the children played could have been the source of some of the lead found in their blood.

The lead in the soil probably came from house paint which settled to the ground during normal weathering or when the houses were stripped for repainting. The houses that were selected for soil sampling were located throughout Rochester in residential, commercial, and industrial neighborhoods.

Lead remains in the soil which makes soil lead contamination a permanent hazard to children playing near the house. The highest concentrations of lead are found within two feet of the house foundation. The leaching rates of lead in the soil were examined.

RECENT POPULATION TRENDS OF WHITE-TAILED DEER, RUFFED GROUSE, WILD TURKEY, AND BREEDING WARBLERS AT A BRISTOL HILLS LOCATION.
Lynn Braband, Biology Department, Roberts Wesleyan College, 2301 Westside Drive, Rochester, NY 14624

White-tailed deer (Odocoileus virginianus), ruffed grouse (Bonasa umbellus), wild turkey (Meleagris gallopavo), and breeding warblers (subfamily Parulinae) were among the wildlife populations monitored from 1981 through 1985 at Roberts Wesleyan College's Davis Mountain Campus near Naples, NY. Techniques utilized were pellet group plots, winter track transects, and auditory indices. Deer numbers varied considerably with a high during the winter of 1983-84 followed by low numbers in the winter of 1984-85. Ruffed grouse were common at the beginning and end of the survey period and scarce during 1983 and 1984. Turkeys were present throughout the survey period and were apparently most common during the winter of 1982-83. From 1981 through 1984, an average of 4 (range 3-5) warbler species were common breeders at Davis Mountain. In 1985, 11 species were common. Possible contributing factors to population fluctuations will be discussed.

THE STATUS OF RARE REPTILES AND AMPHIBIANS IN WESTERN NEW YORK.
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The Department of Environmental Conservation is responsible for the management of all fish and wildlife, which includes the 69 species of amphibians and reptiles that are recognized as native to New York. Prior to 1971, the only two regulations concerning the taking of herps were (1) the listing of "frogs, land turtles, box and wood turtles and the bog turtle" as protected small game species and, (2) a provision which allowed a bounty on timber rattlesnakes. In 1971, a prohibition was placed on all bounties and the Environmental Conservation Law was amended to allow the designation of endangered species. The following year the bog turtle became the first herp to be added to the endangered species list.

By the late 1970's it became apparent that the first endangered species list did not reflect the true status of New York's fish and wildlife. An extensive review of all 718 vertebrate species resulted in the adoption on 11 June 1983 of a revised list of 85 species designated as endangered, threatened or special concern. This list includes seven amphibians and fifteen reptiles, nine of which occur in western New York. Factors contributing to the decline of these herps include habitat loss or degradation, acid rain, and unregulated taking or collecting.

Status surveys of the two endangered herps in western New York, the bog turtle and the eastern massasauga, and one threatened herp, the timber rattlesnake, concluded that all three have declined markedly in recent years. Activities that are necessary to ensure that these species will remain a part of New York's fauna are habitat protection, education of the public, and protection from illegal killing or collecting.

Detailed studies have not been completed for five of the herp species listed as special concern: the Jefferson salamander, the blue-spotted salamander, the spotted salamander, the spotted turtle and the wood turtle. Preliminary research on these species has indicated that habitat loss, water quality and unregulated collecting are negatively impacting these species.

A NEW EURYPTERID HORIZON (MONROEAV BED) AT THE BASE OF THE VERNON FORMATION, SALINA GROUP, SILURIAN OF WESTERN NEW YORK STATE.

Samuel J. Ciurca, Jr., 48 Saranac St., Rochester, New York, 14621.

The basal strata of the Silurian Vernon Formation (Salina Group) in western New York contains an interval of eurypterid-bearing black and variegated shales that is usually called "Pittsford Shale."

During the Spring of 1985 construction of a new on-ramp at Monroe Avenue and Interstate 590 South revealed a section of strata close to the contact with the underlying Lockport Group. The newly observed strata is

unknown in natural outcrop and has only been noted in a core (see p. 103, Clarke & Ruedemann, 1912).

The newly exposed shales contain a profusion of Lingula sp. and represent, essentially, a Lingula Bed. Associated, however, are rare eurypterid fragments including a swimming-leg joint and metastoma characteristic of the eurypterid Eurypterus pittsfordensis known previously only from stratigraphically higher beds.

This newly observed Lingula-eurypterid bed is dark grey in color weathering to a light yellowish to greenish grey and corresponds to the seven feet of strata just above the Lockport Group described in the above reference. This bed is herein named the Monroeav Bed and is the lowest eurypterid horizon currently known in western New York.

The stratigraphically higher "Pittsford Shale" horizon (Sarle, 1903) so well-known for its abundance of Hughmilleria socialis is herein redefined as the Pittsford Bed with the type area being in the old Erie Canal behind the Spring House.

Additionally, an eurypterid horizon (another black shale) known for its abundance of E. pittsfordensis and that occurs 20-40 feet above the Pittsford Bed occurs in the village of Pittsford along the Barge Canal. This bed is herein named the Barge Canal Bed.

SOME COMPLEXES OF N-(2-MERCAPTOPHENYL)-SALICYLALDIMINE.
Thomas A. Donovan and Hala Al-Easa, Dept. of Chemistry, Buffalo State College, 1300 Elmwood Ave., Buffalo, NY 14222

Condensation of 2-mercaptoaniline with salicylaldehyde in ethanol produced the anticipated Schiff's base: N-(2-mercaptophenyl)salicylaldimine ($C_{13}H_{11}NOS$)(I). Reaction of I with $Co(C_2H_3O_2)_2 \cdot 4H_2O$, $Ni(C_2H_3O_2)_2 \cdot 4H_2O$, $Cu(C_2H_3O_2)_2 \cdot H_2O$, and $Zn(C_2H_3O_2)_2 \cdot 2H_2O$ in warm methanol produced $Co(C_{13}H_9NOS) \cdot H_2O$, $Ni(C_{13}H_9NOS) \cdot H_2O$, $Cu(C_{13}H_9NOS) \cdot H_2O$, and $Zn(C_{13}H_9NOS) \cdot 1\ 1/2\ H_2O$. These complexes were characterized by elemental analysis and by measurement and interpretation of their infrared spectra and magnetic moments.

A STUDY OF AN ISOLATED POPULATION OF THE SHORT-HEADED GARTER SNAKE, THAMNOPHIS BRACHYSTOMA, FROM CHEMUNG COUNTY, NEW YORK.
William K. Engelder, Richard C. Bothner, Department of Biology, St. Bonaventure University, St. Bonaventure, New York 14778.

Thamnophis brachystoma, first described by Cope in 1892, occurs in the upper Allegheny River drainage north of its confluence with the Clarion River. This form is thus an Allegheny High Plateau endemic, being primarily confined to northwest Pennsylvania and southwest New York.

Wright & Wright (1957) mention Harold Axtell's discovery, in 1947, of 64 specimens in the Susquehanna River drainage near Horseheads, Chemung County, New York. Axtell first considered this to represent an introduced population but later opined that it might be subspecifically distinct.

We examined Axtell's specimens which were borrowed from the Buffalo Museum of Science as well as specimens we collected from the Horseheads area. These specimens do not differ morphologically from those of the main population.

Mark-recapture studies were done on the Horseheads population to determine density, sex ratio and age distribution. These are compared with studies done on the main population.

IS "GARDEN" A FIGHTING WORD? Herman S. Forest, Biology Department, SUNY College, Geneseo, New York 14454.

Some individuals have been moved to threats, harassment or physical violence by plants growing on the property of others. Given similar circumstances in another community, response would be a more or less good natured joke, admiration, and copying.

Although governments do regulate aesthetics to some extent, no specific plants are approved or disapproved. Legal language is vague and couched in terms of "Health and welfare," and "safety" (access to house). In all cases where gardens have become an issue, laws may be used, but interpretations are case specific.

Class values are more basic than laws. Lawns of close clipped, homogeneous grass are associated with higher social status when there has been a movement upward. Deviation from the style is interpreted as a threat to lower status again.

In addition, there is an educational foundation for response to gardening style. Diverse gardens with shrubs and "wild" flowers have been promoted actively at the national level by the Audubon Society and others. Wildflower seeds are now a popular item in retail sales. In court, at Kenmore, New York, the prosecution's witness admitted that he sold wildflower seed at his garden store. However, few of Kenmore's citizens read conservation literature or know how to identify more than a few plants. What is recognized only as a "weed" may be a European garden flower. Poisonous plants such as nightshade grow unnoticed, and poisonous yew is almost universal in landscaping of certain kinds of subdivisions.

In contrast to intolerant communities (Kenmore, New York and Sun Praire, Wisconsin) others are more tolerant (19th Ward of Rochester, New York and Madison, Wisconsin).

EARTH PILLAR DEVELOPMENT IN THE MOUNTAIN PINE REGION, BELIZE. Mark Francek, Department of Geography, State University College, Geneseo, New York 14454.

Earth pillars are microscale features prominent along roadcuts in the Mountain Pine Ridge of Belize. Usually less than 10 cm. in height and capped by

pebbles, these cyclindrical structures are coarsely textured. These microforms represent an equilibrium between the laterization process and erosion by sheetwash. Formation begins when percolating ferrous oxides impregnate pebbles and produce a dripline that, when oxidized and later exhumed by sheetwash, resists denudation on slopes up to five degrees. Earth pillars are but one of a variety of laterite landforms ranging from mesas and cuirasses on the macroscale to earth pillars on the microscale.

A POPULATION STUDY OF THE HELLBENDER, CRYPTOBRANCHUS ALLEGANIENSIS, IN THE ALLEGHENY RIVER DRAINAGE OF NEW YORK STATE. Jeffrey A. Gottlieb, Richard C. Bothner, Department of Biology, St. Bonaventure University, St. Bonaventure, New York 14778.

These are the results of two years of Lincoln-Peterson mark-recapture studies done during mating season (August through October). Sex ratios, age class distribution, density and nest site locations were determined. These were compared with current literature on this form from out of New York State, and with early literature from within New York State.

REVISED UPPER MARCELLUS (MIDDLE DEVONIAN) CORRELATIONS IN THE CHENANGO VALLEY REGION: CENTRAL NEW YORK

GRASSO, Thomas X., Geosciences Dept., Monroe Community College, Rochester, NY 14623; BRETT, Carlton E., Dept. of Geological Sciences, Univ. of Rochester, Rochester, NY 14627; and BAIRD, Gordon C., Dept. of Geology, State University College, Fredonia, NY 14063

Approximately 1.6 and 1.7 miles North of Morrisville, along Swamp Rd., are two classic upper Marcellus exposures, a borrow pit exposing 35 ft. of strata and just north a roadcut exposing 70 ft. The upper Marcellus Formation (Bridgewater, Solsville, Pecksport Mbrs.) in the Chenango Valley is widely noted as a source of exceptionally well preserved fossils. Much has been published on the fauna of the Swamp Rd. localities as they have yielded a rich and varied assemblage, especially mollusks preserved with fine shell microstructure. The brachiopod Spinocyritia, the bivalve Gosselletia and snails (Bembexia, Palaeozygopleura) are conspicuous faunal elements. Previous workers have placed the Swamp Rd. exposures in the Solsville or Bridgewater-Solsville Mbrs. However, recent fieldwork reveals that these localities should be referred to the stratigraphically higher Pecksport Mbr.

The Swamp Rd. localities cannot be Bridgewater or Solsville, as the nearest definite exposures of these units, at Pine Woods, are dissimilar in fauna and lithology. Also, a distinctive event bed containing robust in situ specimens of Gosselettia and other well preserved fossils occurs at the top of the Spinocyritia-Gosselettia assemblage at Swamp Rd. This bed was located 30 to 40 ft. below the top of the Marcellus in two nearby ravines, including the Pecksport

type section; the Solsville occurs at least 130 ft. lower. This confirms an upper Pecksport position for the Swamp Rd. localities which, for over 30 years, have consistently been misplaced stratigraphically too low.

STRATIGRAPHY AND PALEOENVIRONMENTAL INTREPRETATION OF THE BERTIE GROUP (LATE CAYUGAN) IN NEW YORK STATE:
HAMELL, Richard D., Geosciences, Dept., Monroe Community College, Rochester, NY 14623

The Bertie Group (Late Silurian) of New York State is a complex package of sabkhal to subtidal deposition of carbonate sediments. Several bio-lithofacies are traceable from eastern Ontario, Canada to Cedarville in eastern New York: a geographic distance of approximately 250 miles.

Eight bio-lithofacies are recognized based on sedimentary structures, petrographic analysis, and fauna: 1) unfossiliferous blocky dolomitic shales (sabkha); 2) evaporite-bearing dolomitic shales (hypersaline lake); 3) collapse and rip-up breccias (lower supratidal); 4) finely laminated eurypterid-bearing dolostones (upper to lower intertidal); 5) thick bedded, discontinuous and wavy laminated dolostones (lower subtidal); 6) lithographic limestones (restricted subtidal); and 8) pyritic, laminated shaley dolostones (semi-restricted estuary-lagoon).

These bio-lithofacies cyclicly overlie one another within the Bertie Group and occur in stratagraphically higher units as well. This has led to incorrect correlation of younger units (Cobleskill Fm., Late Silurian; Chrysler Fm., Early Devonian) with the Bertie. The fact that these relatively thin but widespread bio-lithofacies in the Bertie are remarkably consistent and apparently isochronous along the outcrop belt suggests deposition occurred in East-West facies belts parallel to a northerly shoreline. The cycles appear to result from repeated transgressions and regressions in a North-South direction parallel to the basin's axis.

PROBLEM SOLVING IN PHYSICAL CHEMISTRY USING ELECTRONIC SPREADSHEETS. Bhairav D. Joshi, Department of Chemistry, State University College, Geneseo, NY 14454.

Electronic spreadsheets have been generally thought of as programs useful for bookkeeping and business oriented applications. However, a closer look at the facilities provided by some of these programs reveals that they are also well suited for use as scientific proglem solving and data analysis tools. This paper focuses on the ways we have been using Lotus 1-2-3 for

solving physical chemistry problems on an IBM PC. Three types of problems are used as illustrations.

1. Iterative problems, i.e., the Newton's method for finding roots of equations.
2. Tabulation and high resolution graphics display of non-trivial functions, i.e., Hermite polynomials and harmonic oscillator wave functions.
3. Curve fitting, and assessing the degree of the fit, i.e., expanding a given function in terms of a complete orthonormal set of functions.

Lotus 1-2-3 templates that solve above problems will be presented and discussed.

UCSD PASCAL: A LEARNING EXPERIENCE, A. Lamendola
Empire State College, Rochester, NY, 14607

Today's proliferation of computers at work, at home, schools and stores as well as continuous and ever increasing advances in computer sciences have made it imperative that we learn at least one high level programming language. This paper describes experiences and some of the pitfalls in learning UCSD Pascal. Compelling reasons for a study of this language are presented and a useful learning program is described.

ALPHA CALCIUM SULFATE AS A SCAFFOLD FOR BONE GROWTH TO INCORPORATE CERAMIC ALLOPLASTS.

C.R. Lange*, J.P. Rausch, L.A. Storbeck and A.A. Haymes**;
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**Division of Biology, College of Liberal Arts and Sciences, Alfred University, Alfred, NY 14802.

Large full thickness defects (5 mm dia) drilled in the rami of the adult rat mandible will not grow closed with bone when left unfilled. These non-healing bony defects are the implant site of choice when attempting to fabricate a ceramic bone substitute.

Adult rats were fasted for at least 12 hours prior to being anesthetized. Following hair removal and antiseptic scrub, the mandibular rami were exposed bilaterally. A dental handpiece fitted with a 5 mm round bur was used to create the full thickness defects. These defects were irrigated with warm isotonic saline, suctioned clean, and then packed with sterile gauze.

Two different forms of a ceramic composite compound of synthetic hydroxylapatite (HA), $Ca_{10}(PO_4)_6(OH)_2$ (20-40 mesh) and

alpha calcium sulfate (DS) Ca $SO_4 \cdot 2\ H_2O$ were implanted in the experimental defects in the mandibles. Compound A samples contained the above ingredients and were preformed while Compound B samples contained all of the above and were fresh-mixed at the time of implantation.

Following closure the rats were kept for 2, 3, 4, 6 and 8 weeks. Histologic and radiologic studies of the experimental defect repair were followed for the total time period of 8 weeks to determine whether pharmaceutical grades of HA and DS could be used to fabricate preformed and fresh mixed alloplasts for bone repair and if the presence of DS and HA accelerates osteogenesis with the incorporation of the HA particles into new bone.

Radiologic studies showed that these materials could be used successfully to form alloplasts to assist in bone repair.

The fresh-mixed composite, while showing a small amount of particle migration, essentially stayed in position and conformed completely to the defect. While preliminary photomicrographs are inconclusive there is growth of healthy fibrous tissue and some new bone observed at the bone-implant interface.

STUDENT ATTITUDES TOWARD THE NEW YORK STATE ENVIRONMENT. Cheryl Lougeay, Department of Geography, State University College, Geneseo, New York, 14454.

College student attitudes toward the environment are illustrated through analysis of questionnaire responses. Despite a general awareness of environmental problems, there appears to be a lack of expressed self commitment and a low level of state knowledge. Computer-generated statistics were used to determine the characteristics and attitudes of the student population in Geography classes who participated in the survey, and to analyze the factors which tend to predict environmental concern. The results of the survey suggest that specific issues involving the human - environment interrelationship are not well understood by today's students. Students who complete college courses dealing with environmental problems display higher levels of awareness and knowledge, but instruction has not played a strong enough role in furthering student appreciation of human and natural environment issues.

THE OSTEOINDUCTION EFFECT OF MAGNETIZED BARIUM FERRITE.
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Osteoinduction, the stimulation and the growth of the existing bone by means of an electric and/or a magnetic field has been an exciting area of study for the past thirty years. Many reports in the literature have shown that by using either implanted electrodes or externally applied pulsating magnetic or electric fields, fibrous non-union of bone fractures and other bone defects may be stimulated to heal by the generation of normal bone tissue. A

more recent development reported was the attempt to stimulate osteoinduction by the implantation of barium titanate piezoelectric ceramic into defects created in animal bone. The present study was an attempt to determine whether a permanent ceramic magnet would induce bone growth when placed in surgically created bone defects.

Barium ferrite magnets, $BaFe_{12}O_{19}$, were fabricated into rectangular pieces which were approximately 4 x 2 x 1mm in size. Using a fluxmeter the average remnant induction was determined to be 27.1×10^{-8} Webers with a standard deviation of 3.9×10^{-8} Webers. This magnetic field strength was selected so that it would be in the same range as those reported in the literature for an external pulsating electromagnetic device found to be effective for osteoinduction.

The ferrite pieces were implanted into the femora of 8 adult male rats. The implants were placed into a 9 x 1mm trench defect created through the lateral cortical surface with the aid of a dental handpiece and a cylindrical cross-cut carbide burr. The implants were placed into the defect so that they were approximate flush or slightly protruding beyond the outer surface of the bone. The implants extended into the medullary canal for some distance. The implants made a contacting tight fit with the short dimension of the defect. The left femur of each animal received a magnetized ferrite implant while the right femur received a non-magnetized ferrite implant which served as the experimental control. Following implantation, the magnetized and non-magnetized implants were retrieved at the end of 1,2,3 and 4 weeks. The implants were removed in situ within their block of surrounding tissue.

Histological evaluation was performed using both light and the scanning electron microscope. Each femur block section was fixed in a buffered formalin-glutaraldehyde solution for a minimum of 4 hours after which they were dehydrated in a series of ethanol-tertiary butyl alcohol and embedded in low viscosity Spurr epoxy.

A METABOLIC BIO-ASSAY REVEALING KIN RECOGNITION IN HONEY BEES (APIS MELLIFERA L.).

Robin F.A. Moritz,
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Volatile semio-chemicals play an important role in insect communication. This is particularly well documentd for social insects. A vast literature exists on social and individual behavior of honey bees (Apis mellifera L.) which is released by pheromones of the queen or workers. Since the propagation of the theories of inclusive fitness, which predict the existance of kin recognition in social hymenoptera, volatile semio-chemicals became of interest as possible recognition cues. Several behavioral studies showed that honey bee workers can discriminate between related an unrelated nest members. Volatile odors were claimed to be the recognition cues, though other stimuli could not be definitely ruled out. Most of these behavioral studies were based on observations rather than on quantitative measurements. Here, an objective quantitative approach

is presented, which rigorously tests volatile compounds excluding other possible stimuli as recognition labels.

A metabolic bio-assay, previously used to quantify the reaction of honeybee workers to the alarm pheromone, revealed kin recognition mechanisms in honey bees. In a flow-through system groups of honey bees were exposed to the volatile odors of queens, workers, or drones respectively, with different degrees of relationship, G. The oxygen concentration in the test group was measured continuously as a correlate to metabolic activity. The intensity of the typical short term activity peak, as response to the odor presented, had a significant negative regression on G ($b = -.98$, $p<.01$). Drones did not show any reaction when exposed to odors of unrelated queens or workers.

These findings are in line with the predictions made by the theory of inclusive fitness and show that volatile compounds indeed are used as recognition templates by honey bee workers. Drones do not reduce their fitness in favor of related individuals and therefore are unlikely to develop kin recognition abilities.

Acknowledgement: Financial support was given by the Alexander-von-Humboldt-Stiftung and the Research Foundation of the State University of New York.

SCIENCE OF PSEUDO-SCIENCE? THE PERILS OF RATING PLACES. Darrell A. Norris, Department of Geography, S.U.C. Geneseo, Geneseo, N.Y. 14454.

Early in 1985, the discovery of an error in Rand McNally's rating of the Rochester metropolitan area propelled the city from a mediocre to an eighth place finish in America's most publicized urban quality of life stakes. This paper demonstrates the many flaws which pervade the logic and measurement systems used to rate urban areas. Because of these flaws, the final rankings obtained are extremely suspect, yet they receive extensive mass media coverage, and may adversely affect cities' efforts to achieve sustained growth. Greater public awareness of the perils of rating places is long overdue.

TERRAIN SHADOWING PROBLEMS AND IMAGE ANALYSIS IN ALPINE ENVIRONMENTS. Tamara Perkins, and Ray Lougeay, Department of Geography, State University College, Geneseo, New York 14454.

Identifying features of landscape in alpine environments can be accomplished through the use of Landsat data, however features of near resolution size are often misidentified. Typically low reflectance values from bodies of water and shadows (both from clouds and topography) and high reflectance values from snow and clouds produce confusion in identification. The main objective here was to distinguish those features which are

easily misidentified.

The "Digital Image Analysis System (DIAS)" software package for use with the Apple II microcomputer was used to display profiles and density slices at an 80 meter resolution level. Using Landsat MSS data (800-1100 nm) water was distinguished from most topographic shadows, however where shadows became very dense, both from clouds and topography, the two were confused. Snow and clouds were difficult to distinguish but snow was usually found to have higher reflectances than clouds in this spectral band. After the digital image analysis was completed, reference data were compared using the "Grassroots" GIS software package. An accuracy of greater than 80% was typical for most scenes under study.

POWER SERIES SOLUTION FOR CN PULSES IN SELF-INDUCED TRANSPARENCY. C. Palmer and L. Matulic, Department of Physics, St. John Fisher College, Rochester, New York 14618

We apply a novel power series method of solution to the equations governing the interaction of the strong electromagnetic fields of a laser with two-level atoms in a nonlinear attenuator. We limit ourselves to the steady-state regime and to the slowly-varying field approximation. This method avoids the use of an ad hoc "factorization" assumption which all previous analytic solutions require. In particular, we exhibit explicitly analytic solutions for the so-called zero-pi lossless and distortionless pulses. We also solve the zero-pi pulse case numerically using 152 equations for the time coefficients in the power series expansion of the atomic variables and find that they agree with the analytic solutions to a very high degree of accuracy.

ACTIVITY PATTERNS AND HABITAT RELATIONSHIPS IN THE FRESHWATER TURTLE EMYDOIDEA BLANDINGII.

Peter J. Petokas, Department of Biological Sciences, State University of New York, Binghamton, New York 13901.

Seasonal activity patterns and habitat utilization by Blanding's turtle (Emydoidea blandingii) were studied from spring to fall, 1985, at selected sites on the St. Lawrence River in northern New York. Habitat selected by adults included scrub-shrub wetlands and beaver (Castor canadensis) created wetlands and ponds. Adult females nested during June and ranged far overland while seeking nesting sites. Non-nesting terrestrial activity was rare and was usually restricted to areas near wetland habitat. Adult turtles frequented shallow water habitat from early spring until late June, but selected deep water sites in mid-summer. Aerial basking by adults was observed frequently from early spring until mid-June

but was rarely observed thereafter. Mating was observed in early October.

NESTING ECOLOGY AND REPRODUCTIVE EFFORT IN THE FRESHWATER TURTLE EMYDOIDEA BLANDINGII.
Peter J. Petokas, Department of Biological Sciences, State University of New York, Binghamton, New York 13901.

Selected aspects of the reproductive biology of Blanding's turtle (Emydoidea blandingii) were studied for five consecutive years at Grenadier Island on the St. Lawrence River in southern Ontario. Nest site selection and nest construction began in the evening before dark and typically ended after dark. Females homed precisely to the same nesting area each year. Clutch size ranged from 8 to 18 eggs per clutch, with a five-year population mean of 12 eggs per clutch; mean population clutch size did not vary significantly between years. Adult females ranged in age from 20 to 32 years, in body size from 189 to 226 millimeters carapace length, and in body mass from 1000 to 1410 grams. Clutch size is strongly correlated with body size, but not with age. For individuals, clutch size varies little between years and tends to increase slowly throughout life. Annual reproductive effort (ratio of clutch mass to body mass) remains constant with increasing age.

DNA REPAIR IN AGROBACTERIUM TUMEFACIENS.
R.H. Rothman and E.R. Kelly. Department of Biology, Rochester Institute of Technology, P.O. Box 9887, Rochester N.Y. 14623 and Department of Biochemistry, University of Rochester School of Medicine and Dentistry, 601 Elmwood Ave., Rochester N.Y. 14642

Agrobacterium tumefaciens strains C58 and NT1 (a non-phytopathogenic, Ti plasmid-deficient derivative of strain C58) exhibit identical UV sensitivities and support similar levels of bacteriophage ØC58-1 recovery. Neither strain is capable of photoreactivation or dimer excision. Agrobacterium does, however, seem capable of effecting inducible DNA repair, as measured by Weigle reactivation of ØC58-1. We have not yet studied post-replication repair. We conclude that inducible DNA repair is an important recovery mechanism for Agrobacterium tumefaciens and speculate that it may be related to the well-documented UV-induced enhancement of this species ability to cause tumors in infected plants.

PERTURBATION OF S-1 ENDONUCLEASE ACTIVITY ON SUPERCOILED DNA BY ALCOHOLS. John M. Rovison Jr. and Robert S. Greene; Department of Biology, Niagara University, New York 14109.

Ethanol treatment of supercoiled pBR322 plasmid DNA has previously been shown to promote S-1 endonuclease activity during the reaction (1). The mechanism of such an enhancement has not been elucidated. S-1 is a single-strand-specific endonuclease from Aspergillus oryzae that introduces highly selective cleavages into supercoiled covalently closed circular DNA molecules, but not into their previously linearized counterparts (2). Its activity is now demonstrated to be associated with concomitant changes in the amount of single-strandedness in pBR322 as measured by hyperchromic shift. Results are presented for S-1 reactions after treatment with several different alcohols. Site specificity may also vary with alcohol type as suggested by electrophoresis and densitometry studies.

(1.) Greene, R.S., Robinson, R.R. and B.R. Munson, DNA 4(1): 83, 1985.
(2.) Lilley, D. Proc. Natl. Acad. Sci. USA. 77:6468, 1980.

A MANAGEMENT PLAN FOR ZURICH MUD POND PRESERVE, WAYNE COUNTY, NEW YORK. Mona J. Rynearson, 1746 Welcher Road, Newark, N. Y. 14513

Zurich Bog, a sphagnum bog of approximately 600 acres, is privately owned, in part, by the Bergen Swamp Preservation Society of Rochester, N. Y. A glacial remnant, the bog is bisected north to south by two low drumlins forested in maple, birch, beech and hemlock, the climax forest in this part of New York State. Historically, the sphagnum in the east bog has been harvested for commercial purposes since the 1870's, with the last cutting in 1943.

This east bog is rapidly reverting to the Shrub Bog/Bog Forest stage with encroachments mainly of Leatherleaf Chamaedaphne, Blueberry Vaccinium and Chokeberry Pyrus as well as swamp forest trees such as Red Maple Acer rubrum. A management plan for Zurich Bog was instituted by the Bergen Swamp Preservation Society Board of Trustees in 1985 and provides for an experimental vegetation control to be carried out on selected small sites in the east bog.

Site selection will be determined by biotic survey, avoiding areas that include protected, rare or endangered plants. After botanical inventory and photographic recording, manual harvesting of the shrubby growth will follow. Tentatively, one 0.5 acre site per year will be included in the 3 to 5 year experimental period. At this point, a summary and evaluation of the results would determine the value and feasibility of further management of this type.

The primary objective of this management plan is to determine if these management techniques will be effective in controlling succession and the subsequent loss of habitat for the present bog plants. In the past, the greatest variety of plant species seem to have occurred in periods following harvesting of the sphagnum in Zurich Bog (Annotated List of the Ferns and Flowering Plants of New York State, Homer House, New York State Museum Bulletin No. 254, September 1924). As a secondary

goal, the experimental plots will be monitored closely to document any evidence of such a trend.

THE ORIGIN OF IRONDEQUOIT BAY

SANDERS, Robert A., Geosciences Dept., Monroe Community College, Rochester, NY 14623

The first published work dealing with Irondequoit Bay was a short abstract by Fairchild in 1896 in which he considered the sediments around the bay part of a "Genesee Delta" deposited into Lake Iroquois and spread to the east by longshore drift. This totally ignores the distinction between deltaic and lacustrine deposition. The lacustrine deposits around the bay are still erroneously referred to as a "delta" for reasons totally beyond the author's comprehension.

In 1917, George Chadwick published a more comprehensive paper "Lake deposits and evolution of the lower Irondequoit Valley" vol. 5 pp. 123-160, Proc., Rochester Academy of Science. He separated the valley into 4 parts, one of which was the "bay section" from the float bridge to the present Lake Ontario strand, marked by the barrier beach recently breached for boat transport (Blocking me in my car!).

Chadwick, like Fairchild, has no geologically sound explanation for the "hole" in the bay, and ascribed it to nondeposition due to currents or many small deltas around the bay.

The author's explanation is quite simple: it is a large lobate kettle - with surrounding lacustrine deposits including glacio-fluvial gravels, ice-rafted rocks, and even kames on top of the kame terraces.

1985 LABORATORY STUDIES CONCERNING THE EFFECTS OF COLD SHOCK ON RAINBOW TROUT, Salmo gairdneri. Paul M. Sawyko, Rochester Gas and Electric Corporation, 89 East Avenue, Rochester, NY, 14649.

Fish residing in the thermal plumes of power plants may be subjected to large and rapid decreases in water temperatures should the power plant be shutdown. This situation is termed "Cold-Shock" and may cause loss of equilibrium and/or death to the species involved. This study is the second year of a laboratory program to explore the cold-shock phenomenon as it relates to RG&E on Lake Ontario. Results of similar studies conducted during 1984 were reported at the 1984 RAS Paper Session. During 1985 the scope of study was reduced to provide an additional data base to that acquired during 1984 and to focus in on the lower thermal limit of rainbow trout acclimated to 15°C. Both year's data have been combined to provide the results of this presentation.

Fingerling rainbow trout were acclimated to 15°C for a period of two to three weeks, after which they were immediately transferred into one of six cold water tanks of which average temperatures (and ranges) were: 0.65(0.33-0.90), 0.57(0.55-0.59), 0.74(0.69-0.79), 0.77(0.75-0.80), 0.91(0.88-0.98), and 0.97

(0.88-1.14) for the duration of the 10 day study period. The slight difference in temperatures between tanks allowed for the study of six different temperature conditions near or below the lower limit of 1.0°C, as found in 1984. Ten day mortality values for the six (6) temperature ranges listed above are: 90%,62%,42%, 38%,28%, and 10%, respectively. It was generally found that very little mortality occurred during the first 48 hrs., while the majority of mortalities occurred during the third to sixth day of the test. Lower mortality rates then occurred at all temperatures for the remaining four days of testing.

To further define the temperatures to which these fish were exposed, total heat content of each of the six tanks over the 10 day period was calculated. This was done by multiplying the cold water test temperature by the amount of time at each temperature, which results in a value termed heat-hours. Comparing heat-hours with mortality on a daily basis shows that during the period of heaviest mortality (i.e. days three through six), mortality was inversely related to increasing heat-hours.

This study shows that the lower thermal tolerance limit for juvenile rainbow trout acclimated to 15°C is about 1.0°C and that below 1.0°C mortality is linear with decreasing temperature. Further, these findings also suggest that a well defined thermal time tolorance model can be developed for predicting survival below 1.0°C based on heat-hours.

CAYUGA LAKES BETWEEN GLACIERS. Victor E. Schmidt, Professor Emeritus, Dept. of Earth Sciences, SUNY, Brockport, N.Y. 14420

Surficial deposits along Sixmile Creek southeast of Ithaca, N.Y. include two glacial tills and, between them, a sequence of other sediments. Of major interest are lake deposits of laminated clay and silt, in four series separated by three stream gravels. The lake beds are inferred to consist of varves (annual layers), and to represent a total span of more than 1000 years.

Below the lowest series of varves, and above the lower till, are what appear to be older stream and lake deposits that show evidence of leaching and of frost action and other periglacial processes. Capping these deposits, and immediately beneath the lowest varves, is a possible accretion gley or tundra soil, and a layer of plant remains that include mosses and Dryas leaves. Their carbon-14 age is greater than 40,000 years.

Present evidence suggests that the lower till is likely Early Wisconsin in age, and the younger till Late Wisconsin. The intervening deposits may correlate with the Port Talbot interstadial beds, of Middle Wisconsin age, found at the north shore of Lake Erie.

The four series of varves are inferred to have been laid down in an arm of a lake or succession of lakes in the Cayuga Valley, held in on the north by glacial ice. This proglacial lake or sequence of lakes was higher than the present Cayuga Lake. The level depended on the location of the outlet, which was controlled by the position of the ice front; it therefore changed as the glacier advanced or receded. At various times the

outflow may have been northward and then eastward along the ice front, southward through the Seneca Valley, or southeastward through the Sixmile Valley.

The changes in this lake or sequence of lakes were probably similar to, although much older than, those postulated by Fairchild for postglacial lake succession in the Cayuga Valley. It is expectable that these changes and, indirectly, changes in glacial regimen and climate, are recorded in the varved sediments. The present study has as its major objective the checking of this hypothesis. It seeks clues in the changes in thickness of the varves and their seasonal components, in the occurrence of large amounts of red clay (derived from the Vernon shale?) in some zones of varves, in the variation in carbonate content within varves and in the periodic occurrence within varves of the trails of aquatic animals.

PRIMEVAL FORESTS OF THE PHELPS AND GORHAM PURCHASE. Franz K. Seischab. Department of Biology, Rochester Institute of Technology, Rochester, NY 14623.

The Phelps and Gorham Purchase was an area whose eastern boundary ran from Sodus Bay south to the Pennsylvania line which was its southern border. It was bounded on the north by Lake Ontario and included most of the present Monroe County. Its major western boundary extended south to the Pennsylvania line from the present village of Leicester.

This tract of land was divided into ranges, six miles wide (east to west). Ranges were divided into townships, six miles deep (south to north). The perimeter of each township was divided into one mile segments and surveyed in the period 1788-1792. Forest tree composition, topography, aspect, and soils characteristics were recorded for each surveyed mile.

In the present study each surveyed mile was considered a linear sample plot. Forest composition data were used to generate importance values for each tree species in each plot. These data were subjected to two-way indicator species analysis, a polythetic divisive method of classification. This analysis resulted in the classification of the samples into twelve community types.

The data set divided into two major groups, 205 samples associated with oaks, hickories and chestnut and 758 associated with beech, sugar maple and elm. Seven red pine associated samples separated from the oak-hickory subset. The beech-maple subsample divided into 140 samples associated with white pine and hemlock and 618 samples associated with sugar maple, basswood, beech, elm, and ash. Further subdivisions will be discussed.

PARTITIONING OF BIOMASS BY Eleccharis rostellata Torr. IN THE BYRON-BERGEN SWAMP. Franz K. Seischab, Rochester Institute of Technology, Rochester, NY 14623, John M. Bernard, Ithaca College, Ithaca, NY 14850, Karel Fiala, Czechoslavak Academy of Sciences, Brno, Czechoslovakia.

Partitioning of above- and belowground biomass was determined on Eleocharis rostellata Torr. removed from three sites in the Byron-Bergen Swamp. The sites included a wet, minerotrophic location; an older, well established site; and a marl bed site.

A biomass of 373, 231, and 137 g/m^2 was found for live shoots on the wet, old and marl sites respectively. Live belowground biomass weighed 384, 1409, and 319 g/m^2 on the respective sites. Total living and dead biomass was greatest on the old site (3530 g/m^2) and the least on the marl site (784 g/m^2).

On the wet site resource allocation was directed towards layering culms. Lower production and a greater sexual reproductive effort was seen on the marl site. A larger allocation to root biomass was seen on the old site. This corresponded to a higher root turnover rate of plants growing in anaerobic soils.

USING WEATHER FACTORS TO PREDICT STINGING BEHAVIOR IN HONEY BEES. Edward E. Southwick and Robin F.A. Moritz. Department of Biological Sciences, State University of New York, College at Brockport, New York 14420

The defensive behavior of honey bees (Apis mellifera L.) was quantitated in the field throughout the 1985 season. We used a standardized field test in which numbers of stings in a leather target were counted after single colonies were opened and exposed to an alarm pheromone. By multivariate analysis, we are able to show for the first time how the defensive behavior of honey bees is dependent on a combination of climatic factors. Eliminating genetic factors, the following meteorological variables account for 92.4% of the variation in defensive behavior: air temperature, solar radiation intensity, wind velocity, relative humidity, and barometric pressure. Given these parameters, we can accurately predict stinging behavior of honey bees.

CHANGES IN THE VEGETATION OF THE ZURICH MUD POND PRESERVE, WAYNE COUNTY, NEW YORK BETWEEN 1850 AND 1985; EFFECTS OF HUMAN ACTIVITIES. R. Eliot Stauffer, 353 Oakridge Drive, Rochester, NY. 14617.

The Zurich Mud Pond Preserve is an area consisting of a variety of wetlands and wooded uplands. The characteristic vegetation of the preserve,as it existed in 1939,was described by Stauffer (1959).

Two areas,a sphagnum shrub-bog, and an open pond with surrounding floating moor, have been under continuous observation by the author over the past 46 years. When these observations are combined with early anecdotal records and floristic reports by members and correspondents of the Botany Section of the Rochester Academy of Science from 1881 to 1917,the following conclusions can be drawn.

Prior to 1939,the pond at the north end of the preserve consisted of an open water plankton association bordered by a fringe of floating moor dominated by the loosestrife,Decodon verticillaris. After 1939, the Decodon colonized much of the open pond,but has now been succeeded by a fen dominated by the sedge, Cladium,along with lesser areas of cattail,Typha,to the west. Only small patches of open water,with some surface channels and shallow pools remain during the growing season. A peripheral moat has persisted between the fen and the adjacent bog-shrub and bog-forest associations.

The sphagnum bog-shrub association south of the pond was dominated in 1939 by a dense growth of Leatherleaf, Chamaedaphne calyculata. Records show that from 1876 to 1900 this area was cut for florist's moss,resulting in stripping the area of live sphagnum and other vegetation to a depth of about a meter.

From 1940 to 1943,the same area was again cut for moss to about the same depth. Shallow rooted plants were removed along with the moss,but deeply rooted large shrubs of Vaccinium,Gaylussacia,and Aronia were topped leaving their roots intact. The bog surface was left with a surface of bare,brown peat which was flooded with standing water in winter. Following termination of moss removal,the area has redeveloped through the following stages: for 10 to 15 years the bog assumed the character of a fen dominated by sedges,eg.,Rynchospora, with prominent hummocks of cotton grasses, Eriophorum; following the fen stage,sphagnum mosses slowly reestablished themselves over the bog surface and after 46 years the area has again reached an advanced shrub-bog stage.

SURFACE ACIDITIES/ALKALINITIES [pH] ALONG TRANSECTS OF TWO VEGETATIONAL COMPLEXES OF THE ZURICH MUD POND PRESERVE, WAYNE COUNTY, NEW YORK. R.Eliot Stauffer, 353 Oakridge Drive, Rochester, NY. 14617.

The pH's of the water within 5 cm. of the bog surface sampled at 30 meter intervals along a west to east transect across a shrub-bog association at Zurich Mud Pond Preserve ranged from 3.60 to 4.85. At the west edge of the bog, near the border of a tamarack, Larix, bog forest,the pH was 4.00. Within a few meters, the pH values dropped to 3.60 to 3.80 across the bog, but rose rapidly to 4.85 at the east edge of the bog at the contact with the bog forest.

The data indicate that this portion of the preserve is an ombrophilous mire which is not subject at the

surface to flowing ground water. The bog corresponds to Sjörs' Scandanavian mire type termed a moss, or to Bellamy's Hydrological Type 7 mires of Western Europe (Peatlands, P.D.Moore and D.J.Bellamy,Springer-Verlag,NY.,1974). This analysis is also born out by the current prevalence of such plant species as Scheuchzeria palustris var. americana in the sphagnum mat.

A similar set of pH measurements along a south to north transect over the floating Cladium moor and pond of the preserve gave pH values which rose from 3.45 for a surface rivulet near the edge of the tamarack forest bordering the moor on the south, to 6.20 for water in the lagg or moat bordering the moor. On the open floating moor the pH values ranged between 7.65 and 8.20. The dominance of Cladium on the floating moor accords with a Type 1 to 2 hydrological character along with the presence of very calcareous conditions.

A set of 12 water samples collected in the Bergen-Byron Swamp Preserve from springs, streams, marl mud, and sphagnum hummocks on marl gave a much more limited range of pH's. The lowest values, pH = 6.40 to 6.50 were obtained from sphagnum hummocks. Springs or streams in the swamp, and Chara and iron flushes gave pH values which ranged from 6.70 to 7.10. The higher values were yielded by streams running over the marl.

THE USE OF OXYGEN CONSUMPTION AND CIRCADIAN RHYTHM TO FIND METABOLIC DIFFERENCES BETWEEN SUMMER AND WINTER HONEY BEES.

Gregg A. Ublacker and Edward E. Southwick.
Department of Biological Sciences, State University of New York, College at Brockport, New York 14420

The oxygen consumption of both single and clusters of honey bees (Apis mellifera L.) can be measured and the metabolic rates determined. We hypothesize that by using this technique we can find statistically significant metabolic differences between winter versus summer honey bees. Our experimental methods will consist of testing single and clusters of summer bees, testing single and clusters of winter bees and then make comparisons of their metabolic rates (controls). We then will measure the metabolic rates of single and clusters of winter bees along with their brood reared under summer conditions (summerized bees). Our final test will be to measure the metabolic rates of summer bees and their brood reared under winter conditions (winterized bees). From these tests we believe that we will be able to see actual metabolic differences between winter versus summer bees. We also think that the winterized brood will show metabolic rates similar to the winter controls and the summerized brood will have metabolic rates similar to the summer controls.

ROCHESTER ACADEMY OF SCIENCE
ROCHESTER, NEW YORK

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HONORS AND RECENTLY ELECTED FELLOWS

MEMORIAL TO LAWRENCE J. KING

Lawrence J. King, F.R.A.S., professor emeritus of biology at the State University College at Geneseo, died in July, 1985. He was 70 years old.

Larry king played a significant role in the development of the College's biology department from 1965 until his retirement in July of 1981.

He was an international authority on weeds. His massive volume *Weeds of the World: Biology and Control* was published in 1966 and included 3000 references in all languages. It was compiled in years of thorough searches of major libraries. He described it as "... the first general survey of the history and origin, botany, spread and control of many kinds of weeds."

His teaching and research continued until retirement. Graduate students often joined in this investigation on the physiology of plants, particularly crop plants.

Joyce Benson King, was her husband's enthusiastic co-worker, and a pleasant, friendly presence on social occasions. After Larry's retirement, they published *Plant Lore*, a journal devoted to "things about plants that no other journal will print." *Plant Lore* was a treasure of folklore and curious observations about plants; the sort of thing both scientists and laymen enjoy reading and talking about.

The Rochester Academy of Science was Larry's chief outside interest. He served as vice-president, a member of the publications committee, publicity director, and he worked on the Academy's Centennial year program. The Academy honored Larry by naming him a Fellow of the Academy. His lasting monument in the Academy is the annual conference for the presentation of papers by scientists and students. In 1974, Larry King and Mel Wentland organized the first, annual Fall Scientific Paper Session. The abstracts of the meetings were subsequently published in the *Proceedings*. Because of the considerable expense involved, this is the last issue of the *Proceedings* devoted to the meeting abstracts. The Academy will continue to honor Larry King with the "L.J. King Memorial Lecture" which will be featured at each Fall Scientific Paper Session.

BRUCE GILMAN
FELLOW
1985

For more than 25 years one of the important endeavors of the Rochester Academy of Science has been the administering of Science Research Grants for the assistance and encouragement of students in carrying out their research projects. Just thirteen years ago a senior at St. John Fisher College named Bruce Gilman was the recipient of such a grant, which helped in the completion of his senior project called *Vegetation of Thousand Acre Swamp*. It has been with special interest, therefore, that we have observed our grantee's subsequent progress in earning a Master's degree in Aquatic Biology and Botany at the College of Environmental Science and Forestry at Syracuse, where his researches produced the thesis, *Primary Productivity of Wetlands Along the Shore of Lake Ontario*.

Since 1975 Bruce Gilman has been Assistant Professor of Conservation at Community College of the Finger Lakes in Canandaigua. In 1979 he served as Chairman of the Academy's Sixth Annual Scientific Paper Session held at that institution. He has compiled and published an important botanical volume, *Flora of Ontario County*. He has served as Academy Vice-President; he is currently Chairman of the Botany-Entomology Section and he is Curator of the Academy's Herbarium.

It is with a very special pleasure, therefore, that for his accomplishment's in his field and for distinguished service to the Academy, we confer on our one-time grantee, Bruce Gilman, this Fellowship in the Rochester Academy of Science.

HELEN RICE

FELLOW

1985

Miss Helen Rice is a person with a dedicated interest in conservation and nature study which has manifested itself in valuable service to organizations with objectives similar to her own.

Almost since the inception of The Thousand Acre Swamp as a protective preserve, Helen has been active in its development. One could say she has been "deeply involved in the swamp." She has served as a member of the Board of Trustees, which she chaired for two years, and has been a frequent group hike leader. Her dedication and commitment as Chairman of the Master Plan Committee for the swamp has helped greatly in putting together a difficult and comprehensive report. For this it was necessary not only to deal with technical ecological information but also to develop a strategy by which members of The Thousand Acre Swamp Committee could act individually in support of environmental issues that have arisen in a politically charged milieu. Currently, she chairs the Preservation Committee for the swamp.

In addition to her involvement with The Thousand Acre Swamp, Miss Rice has been active during the past several years in the Genesee Ornithological Society of the Academy as Treasurer and Vice-President. She currently chairs the Program Committee. During the past five years she has also been a volunteer surveyor in the Rochester region portion of the New York State Breeding Bird Survey program of the Federation of New York State Bird Clubs.

Miss Rice was born in St. Johnsville, New York, attended Geneseo Normal College and Albany State, then completed a Master's Degree in Educational Administration at the University of Rochester. She devoted 33 years to the West Irondequoit School District, serving the last ones as Assistant Superintendent of Curriculum and Instruction. She retired twelve years ago and has travelled extensively throughout the world to explore her interests in nature.

For her dedicated work and excellent contributions to the areas of conservation and natural history we are honored to make Miss Helen Rice a Fellow of the Rochester Academy of Science.

JOHN A. RIVERS

FELLOW

1985

John Rivers could be called the "Father of the Fossil Section" of the Academy. Nine years ago he began the Fossil Club and directed its move to becoming a section of the Academy. He has held many offices in the Fossil Section including President, Vice-President and Field Trip Chairman. Eight years ago John originated the *Fossiletter* and wrote for the newsletter for five years. He has been a diligent and enlightened leader of the Fossil Section.

However, John Rivers interests in fossils goes beyond the Fossil Section of the Academy. He gives freely of his knowledge and experience with fossils to friends - or friends of fossils. He has co-authored a book on field locations for fossil collecting for the state of New York, and has written several articles on paleontology and fossils in other geographical newsletters. In addition, he has actively participated in community events concerning fossils and paleontology, such as Geology Day at the Rochester Museum and Science Center and the Gem, Mineral and Fossil Shows. John is currently employed with Burrough Corporation, but he finds time to teach classes on fossils and paleontology at the Rochester Museum and Science Center and in the Greece Athena School District Continuing Education Division.

John was born in Bristow, Oklahoma, and has lived throughout the midwest. He and his wife, Gail, have four children. For 23 years he has been involved in scouting, as a scout, a scoutmaster and as a scout commissioner.

For the continuing work and dedication that John Rivers brings to the world of fossils and paleontology, we are honored to make him a Fellow of the Rochester Academy of Science.

ROBERT SPAHN
FELLOW
1985

Perhaps more than in many fields of scientific endeavor, Ornithology depends on the activities of volunteers and amateurs. Today's popular pastime of birdwatching produces literally millions of bird life observations and sightings, the sum total of which forms much of the life blood of the science of Ornithology. But it is only when those observations and sightings are properly recorded and organized that they have any real value. One person who has contributed much to such an orderly arrangement is Robert Spahn, whose lifelong interest in birds began in his native Dubuque, Iowa, where the high honors he won, both scholastically and in scouting, included a Bausch & Lomb Science Award.

Currently involved with Physics research at Kodak, for the past eight years he has served the Genesee Ornithological Society of the Academy as statistician, keeping accurate and exhaustive records of bird life in the Genesee region. These are published regularly in *The Goshawk* and *The Kingbird*, publications, respectively, of the Genesee Ornithological Society and the Federation of New York State Bird Clubs. Since 1982 he has been editor of the department in *The Kingbird* called "Highlights of the Season" where he summarizes ornithological happenings in the entire state of New York. And for the past five years he has coordinated the efforts of the many volunteers in the Genesee region who have gathered reams of data for the monumental New York State Breeding Bird Atlas, soon to be published.

For his invaluable services in making vast amounts of ornithological data, both local and statewide, available and of real value to the science of Ornithology, we take pride in naming Robert Spahn a Fellow of the Rochester Academy of Science.

JOHN SINKANKAS
HONORARY MEMBER
1985

It is with great pleasure that I introduce to you Dr. John Sinkankas as honorary member of the Rochester Academy of Science. Few individuals in any branch of science ever significantly influence the broad population of their interest area. The names of the greats that come to mind are usually those associated with ideas frequently incomprehensible to but a few equally esoterically inclined individuals. In my opinion, John occupies a unique and priviliged niche. He has concentrated his creative efforts to the benefit of, not the specialist, but the generalist. His efforts have been widely recognized and applauded.

John Sinkankas was born in Paterson, New Jersey. It is logical that such a prolific mineral specimen producing locality in the world, the famous Palisades Sill, would influence a favorite son to greatness. John and his wife, Marge, graduated from the William Paterson College of New Jersey in the middle of the depression years. John then joined the Navy and served many diverse places. John retired from a distinguished naval career in 1961 with the rank of Captain.

It is hard for any active person to retire. He was an editor of the Lapidary Journal for a time and was a research assistant at the University of California and aided in the investigation of the first moon rocks. His exploits have been legion.

It is also possible for great minds to remain in the closet. The main reason that John Sinkankas is so greatly admired and loved is that he has shared his knowledge via an active mind and equally active pen. During the course of his second retirement into a third career, John's reputation has evolved. Since 1955, while he was on active duty in the Navy, through to the present, a dozen books have appeared in print with Sinkankas scholarship. From the days of Peter Zodac's *Rocks and Minerals* magazine to the present, 120 Sinkankas articles have appeared. John's current effort is a bibliography of the gemological literature, which he feels will serve as a much needed research tool.

A great many well-deserved honors have come to John Sinkankas. He received an honorary Ph.D. from his alma mater recently. Sinkankasite, a phosphate mineral from South Dakota, was also recently christened in his honor. Today, we, too are pleased to recognize John's accomplishments. May I present to you, Dr. John Sinkankas, honorary member of the Rochester Academy of Science.

WILLIAM C. COLSMAN
FELLOW
1986

William C. Colsman's interest in the natural world may well have been begun in early life when he helped his father mining in the rugged mountains of Colorado.

Upon his graduation from the University of Colorado, he worked for the Eastman Kodak Company in many capacities until his retirement as Comptroller of the Elmgrove Division.

Bill and Rhea Colsman live on Coniston Drive, Rochester and own and manage a large wildlife preserve and tree farm from Bristol Springs where a wide variety of wildlife is ideal for observation and study. Bill has become one of our foremost amateur photographers and invented an advanced design for a bird-song recording microphone.

Associated with the Boy Scouts of America for several years, he is currently an Elder in the Memorial Orthodox Christian Church of Rochester and secretary and board member of the Heritage Christian Homes, an organization dedicated to helping young people.

Bill is Past-President of the Genesee Ornithological Society for which he has conducted many indoor programs and led many field trips. His extensive travels abroad provide fascinating material for a growing audience.

As a member of the Publications Committee of the Ornithology Section of the Rochester Academy of Science, he compiled much of the data for the Revised Annotated Check-List of the Birds of Monroe County, an important ornithological reference work.

As Treasurer of the Rochester Academy of Science he was instrumental in improving the method by which section dues were collected. He is currently a Director.

For his conscientious citizenship, his achievements in the world of natural science, and his contributions to the Rochester Academy of Science, William C. Colsman well qualifies as a Fellow of the Rochester Academy of Science.

HARRY SIMON
FELLOW
1986

Born in Cleveland, Ohio, Harry was brought to Rochester when four years old. He attended #20 school on Oakman Street. The family then moved to New York City where he graduated from DeWitt Clinton High School. Starting as an office boy he rose to the position of assistant purchasing agent.

Married to Ann in 1939, they moved to Rochester in 1941 to open Simon's Baby Furniture store. Son Bobby and daughter Linda have presented them with nine grandchildren. In addition to the demands of his business and the needs of his family, Harry has explored the worlds of stamp collecting, reading, paper-weight collecting and volunteer work.

Coming late to mineralogy, Harry delights in collecting beautiful, interesting and odd minerals, stamps about minerals and mining, and mineral books.

Harry Simon has been an important factor in the renascence of the Rochester Academy of Science Mineral Section. His enthusiasm for mineral study and generous gifts of his time and business skills have resulted in increased camaraderie and interest. When it became obvious that once a month was not enough, the weekly study group was formed. Harry provided a large heated office where we now have a microscope, a trim saw, several rock trimmers, a black light and storage space for exhibit materials. We are one of very few clubs with such facilities.

Harry has held numerous offices in Mineral Section: Treasurer, Vice-President, Show Committee Chairman, Symposium Treasurer, Symposium Chairman, and presides over the various drawings and auctions we have held recently.

The Mineral Section hereby nominates Harry Simon as a Fellow in the Rochester Academy of Science.

EDITH J. TRYBALSKI
FELLOW
1986

Born and raised in Rochester, Edith Sumriski attended Monroe High School and the University of Rochester where she received her B.A. in Biology and Chemistry, and worked as a Research Assistant in the Medical School.

In 1945 she married Frank Trybalski and they have one son, James, an accountant.

Edith taught Biology in junior and senior high schools and Earth Science in high school, retiring after 25 years of teaching. She spent her sabbaticals studying Biology and Botany at the University of Florida and Soil Chemistry at Cornell University.

She has served the Mineral Section of the Rochester Academy of Science in many capacities and is presently its President. She became editor of the Mineral Section's *Rockester News* during the illness of Katherine Jensen and in 1981 became editor of the Rochester Academy of Science *Bulletin* and still serves in both capacities. She has also served the Academy as a Council Member. The year before the Strong Museum opened, she became a volunteer there and continues to be dependable help. These things she still manages to do while keeping a home for her family and while also assisting her son in his office.

For her past and continuing services to the Academy and for her interest and enthusiasm she brings to her Section and to the Council, we are proud to elect Edith J. Trybalski a Fellow of the Rochester Academy of Science.

RICHARD E. ALBRECHT
FELLOW
1987

Richard Albrecht was born in Charleston, West Virginia. His interest in Astronomy was aroused while in high school when he produced a science fair project which measured atmospheric refraction. This project was awarded first place in the 1964 National Science Fair.

After receiving his Bachelor of Science in Mechanical Engineering at Valparaiso University, he joined the Eastman Kodak Company where he is currently a Project Engineer. He also joined the Astronomy Section, where he served as Vice Chairman, then Chairman, and presently as Coordinator for planetarium telescope operators.

He has a special interest in astronomy education, and has given many slide shows, lectures and demonstrations for the Astronomy Section, school classes, scout troops and church groups, as well as serving as a judge at local science fairs. He has built many telescopes, two of which have won awards for ingenuity and mechanical excellence at Stellafane. His latest is a 16″ reflector, the largest in the Rochester area, located in the observatory, which he also built, behind his home on Honeoye Falls where he invites interested people to share in the wonders of the heavens.

For his outstanding service to the Academy through leadership in the Astronomy Section and his tireless efforts to help increase interest and knowledge in space phenomena, and the instruments with which to view them, we are happy to elect Richard E. Albrecht a Fellow of the Rochester Academy of Science.

BENARTA GLICKMAN
FELLOW
1987

A native of Rochester and still a resident here, Benarta (Bonnie) Glickman was preceded by four generations of Rochesterians. She went to local schools and received her Associate Degree at Monroe Community College where she teaches Biology.

Her work with local science organizations has been impressive: A member of the Bergen Swamp Preservation Society since 1970, and a Life member, she has served in many capacities including President and Newsletter Editor, presently heads the Stewardship and Education and Publication Committees, is a trip leader into Bergen Swamp and the Elizabeth Slater Wildlife Sanctuary. A Life Member of Burroughs Audubon Nature Club, she organizes and leads trips to Oak Orchard. For several years a member of the New York State Outdoor Education Association, she serves as Registrar for Winter Workshops, and is a workshop presenter. She has helped with the docent training for the Rochester Museum and Science Center, and has for several years given talks on animal behavior for the Science Exploration Days at St. John Fisher College. These are only some of her services to the community where she gives talks and serves as judge at science fairs.

She is a member of the Rochester Academy of Science and four of its Sections, where she has also lectured and taught workshops.

For her past services to the science community, and her continuing interest and enthusiasm in the field of natural history and the natural sciences, we are pleased to award Benarta Glickman a fellowship in the Rochester Academy of Science.

WILLIAM HALLAHAN, PH.D.
FELLOW
1987

Bill was born in Philadelphia and grew up in nearby Media, Pennsylvania where he received his schooling. He received his undergraduate degree from Colorado College, taught school for a year and then went to Duke University for his Ph.D. in Zoology.

His father, a physician now retired, has a great interest in natural history, is a rock collector, and has a substantial museum, and Bill's parents are world travelers. It is not surprising then that Bill came to Nazareth College to teach, and that fall gave a paper at the Academy's Scientific Paper Session in 1976. Since then he has chaired Scientific Paper Sessions at the College and at the Rochester Museum and Science Center; has served the Academy for some time as a member of the Publications Committee, and as Academy representative to the American Association for the Advancement of Science; has served as Vice President and now Treasurer of the Academy.

He is chairman of the Biology Department and Director of the Environmental Science Program at Nazareth College, and teaches courses in Biology, Ecology, Animal Behavior, Physiology, and Comparative Anatomy. He has been associated with the Academy for over 10 years and is a member of both the Fossil and Ornithology (G.O.S.) Sections.

For his scientific accomplishments, his services to the Academy, and his continuing interest in promoting knowledge of the natural sciences, we are proud to elect William Hallahan a Fellow of the Rochester Academy of Science.

The Proceedings is distributed on an exchange basis throughout the world to sister institutions and libraries through the University of Rochester Library. Currently, this exchange program involves 125 organizations in 37 states of the United States and 275 foreign institutions. Domestic exchanges include approximately 50% college and university libraries, 10% museums, 10% government research units, 13% sister academies, 7% public libraries and 8% private scholars. Foreign exchanges go to appropriate institutions in 45 countries throughout Europe, Asia, Africa, Australia, North and South America as well as the Caribbean and South Pacific. Publications received through the exchange program are bound into hard cover volumes, catalogued and maintained by the University of Rochester Libraries.