II. CLARION STATE COLLEGE (1973)
(Abstracts 9-19)

Abstract II-9

Seasonal Fluctuations of Selected Dissolved Minerals in the Piney Reservoir, Clarion, Pennsylvania. Thomas Deane, (Clarion State College).

An analysis of physical, chemical, and biological parameters indicates that Piney Reservoir, near Clarion, Pennsylvania, is ecologically an oligotrophic body of water. However, after considering the results of a dissolved inorganic solid or mineral analysis of the reservoir, a discrepancy arises. Of the fifteen dissolved solids sampled on a yearly basis, five exceeded Pennsylvania standards for domestic water supply systems established by the U. S. Public Health Service. These higher mineral concentrations are characteristic of a much more productive ecosystem. Surface run-off from easily eroded stripmined lands, and deep percolation of water through acid spoil bands seems to be the primary cause for the excessive concentrations of the five dissolved inorganic solids.

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Abstract II-10


Three tracks totaling 2,000 acres have been set aside on the Erie National Wildlife Refuge as Research Natural Areas as part of the nationwide program to protect all basic types of biotic communities on Federal Lands. The Jacob Guy Research Natural Area (established 1961)
consists of 160 acres of SAF 23 (Hemlock), SAF 25 (Sugar Maple – Beech – Yellow Birch), and old field. The Lake Creek Research Natural Area (established 1972) include 700 acres of marsh, hemlock swamp (SAF 24), with old field buffer (SAF 25). The Lake Creek Public Use Natural Area of 160 acres adjoins it on the north. The Muddy Creek Research Natural Area (Seneca Unit; established 1972) consists of 1,100 acres and adjoins the 455 Kelly Run Public Use Natural Area. The area is a heavily forested wet flood plain (SAF 16 Aspen, SAF 22 White Pine–Hemlock, SAF 23 Hemlock, SAF 24 Hemlock–Yellow Birch, SAF 26 Sugar Maple – Basswood, SAF 39 Black Ash–American Elm – Red Maple), with open beaver meadow, a meandering stream, and ox bows as well.

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**Abstract II-11**


Blood sample were withdrawn from eleven newly-captured pigeons at two-hour intervals over five 24-hour periods. The blood was subsequently analyzed quantitatively for glucose content.

Pronounced differences in blood glucose levels depending upon the time of sampling indicated that a circadian rhythm did exist. Blood glucose values were higher and more variable during light hours than during dark hours.

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Abstract II-12


Standing crops of terrestrial molluscs were sampled from three different fields in the Clarion area to determine whether a significant difference exists in numbers of molluscs, and to determine whether such differences are species specific. An attempt was also made to determine whether the differences in molluscan densities could be attributed to differences in soil pH or available calcium levels. Species diversity indices were also calculated.

Three samples were collected from each of the three fields. Sampling consisted of pressing a 0.1 m² frame to the substrate and removing all vegetation and soil to a depth of 1.5 cm. The molluscs were sorted from each sample and preserved in 70 percent alcohol for later taxonomic identification. Soil samples of 8-10 cm in depth were collected from three sampling sites from each field with a soil cover. Soil pH was determined, and soil calcium levels were assayed using atomic absorption spectrophotometry.

A significant difference was found in the total numbers of molluscs in the three fields, but this difference could not be attributed to any particular species. No significant difference (at the 0.05 percent level) was found between treatments for soil pH. The results of the calcium analysis were not available when this abstract was prepared.

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Abstract II-13

Allometric Analysis of Pectoral Appendages of the Eastern Chipmunk (*Tamias striatus*). Wayne Koelsch, (Clarion State College).

Regression and allometric analysis indicates that male eastern chipmunks (*Tamias striatus*) have relatively greater olecranon process lengths as compared to females of the species. Large olecranon process length has been linked to greater muscular development in the lower portion of the pectoral appendages. Increased muscle development such as this could be advantageous in such environmental activities as burrowing. Allometric coefficients were found to be markedly less than theoretical considerations would suggest. Theoretical values in this case are based on physical relationship when the only function of the leg is body support.

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Abstract II-14

The Hawk Moths (*Lepidoptera: Sphingidae*) of Southeastern Pennsylvania.

James M. McDonnell, (West Chester State College).

Adult sphingids are known as hawk moths, sphinx moths, or hummingbird moths; the best known of their larvae are called hornworms. Of the 40 genera and 115 species of sphingids found in America north of Mexico, 14 genera are represented in the insect collection at West Chester State College (WCSC). Determinations or confirmations have been made for 21 species belonging to the genera *Manduca*, *Ceratonia*, *Sphinx*, *Lepara*, *Smerinthus*, *Paonias*, *Pachysphinx*, *Cressoris*, *Hemaris*, *Eumorpha*, *Sphecodina*, *Amphion*, *Darapsa*, and *Hyles*. 
The collection of sphingids at the Academy of Natural Sciences in Philadelphia was studied, and their distribution records indicate 25 additional species may eventually be included in the WCSC collection, although 15 of these are likely to be found as strays only. The Economic and Faunistic Insect Survey of Pennsylvania, initiated in 1972, reported just one species of sphingid moth, *Manduca quinquemaculata*.

A few name changes are also noted. The tomato hornworm and the tobacco hornworm, formerly in the genera *Phlegethontius* and/or *Protoparce*, are now placed in the genus *Manduca*. The white-lined sphinx, formerly known as *Celerio lineata*, is now *Hyles lineata*.

While the greatest diversity of form is reached in the tropics, the sphingids of Pennsylvania range in size from species of *Hemaris* and *Lapara* with wing spans of 50 millimeters to *Pachysphinx modesta* with a wing span of 130 millimeters. Color patterns vary from drab *Cressonia* and *Lapara* species to the extremely handsome *Eumorpha* species.

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Abstract II-15


External body and ten standard cranial measurements were made on twenty-five male and twenty-five female chipmunks. Linear regression analysis indicates that no linear relationship exists among any of the ten cranial measurements and net body length. The
data are currently being examined by means of analysis of variance and analysis of covariance to determine if sexual dimorphism exists for any of the ten cranial measurements and/or if it exists for the relationship of the cranial measurements to net body length.

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Abstract II-16


The purpose of this research was to determine whether an industrial waste product could be used successfully as a liming agent to promote and enhance the growth of plant materials on disturbed lands. Preliminary chemical analysis showed the material to contain 44-50 percent CaO, the approximate CaO content of normal agricultural lime. The three research sites included a previously cultivated field, a field in natural grass, and a stripmine spoil. Subplots within sites were randomly selected to receive applications of 0, 2, and 4 tons per acre of waste material. Preliminary results showed that after 11 months, the 2 ton per acre plots had the greatest biomass increase of all three applications.

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Abstract II-17

The Effect of *Polygonum cuspidatum* (Japanese Fleece Flower) Upon Growth and Survival of Selected Hardwood Species Planted on Strip-Mine Spoil. Thomas Sitler, (Clarion State College).

Seedlings of *Betula populifolia*, *B. pendula*, *Prunus serotina*, *Cornus amomum*, and *Symphoricarpos orbisulatus* were planted on stripmine spoil that contained thick growths of *Polygonum cuspidatum* and on areas that were devoid of this species. Preliminary results showed an increase in height of planted seedlings growing under *P. cuspidatum*, but no effects on the rate of survival for these five species of woody plants.

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Abstract II-18


Digestive efficiencies were determined for adult chipmunks housed in a controlled environmental chamber at 20 C, 25.5 C, and again at 20 C under constant humidity and photoperiod. Females were divided into two classes; acclimated and nonacclimated, while all males were acclimated.

Among females, acclimation did not significantly affect food consumption, nor was significance found between males and females. However, significant temperature effects were found for each trial with mean food consumption lowest at 25.5 C.
Analysis of covariance regressing digestive efficiencies on food consumption of females showed significance of acclimation and temperature. Adjusted mean digestive efficiencies of nonacclimated females during the first trial were significantly lower than any others.

Acclimated females were found to have significantly higher digestive efficiencies than acclimated males.

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**Abstract II-19**


Intercellular bridges up to thirty micrometers wide connect nurse cells to oocytes in follicles of *Hyalophora cecropia*, (the American silk moth). Electron microscopic examination revealed the bridges were unobstructed by recognizable barriers to diffusion.

The unobstructed nature of the bridges was confirmed when fluorescein-labeled rabbit serum globulin microinjected into nurse cells moved into the connected oocytes within ten minutes. When protein was injected into the oocyte, it failed to enter the nurse cells; and even after injection into one nurse cell, it did not enter others bridged to the same oocyte (even after one to two hours).

The ATP uncoupler, 2-4 dinitrophenol, reduced the polarity of the bridges, allowing detectable amounts of fluorescent protein to pass from the oocyte to the nurse cells of treated follicles. A
naturally occurring reversal of polarity was found occasionally in the follicles of older animals.

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III. BLOOMSBURG STATE COLLEGE (1974)

(Abstracts 20-28)

Abstract III-20


Six commercial brands of membrane filters were compared for enumerating *Staphylococcus aureus* on both pure cultures and in swimming pool water. The following filters were tested: Gelman GN-6, Millipore HAWG 047SO, Nucleopore NO4OCPR, Oxoid Nuflow, Sartorius SM 114, and Selectron B9. Standard membrane filter (MF) procedures with m-staphylococcus broth were used for enumeration. Plate counts of the pure cultures were made by adding 1.7 percent agar to the m-staphylococcus broth. Counts on all six filters for both pure cultures and pool water varied and the counts on Nucleopore filters were consistently lower than the other brands. The organisms recovered from the pool study were gram positive cocci and the colonies ranged from white to yellow-gold in color. Approximately 15 percent of both the white and yellow-gold colonies were coagulase positive indicating that colony color alone does not denote the presence of coagulase positive *S. aureus*. Since there was no