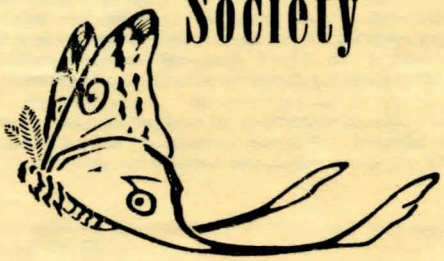
The Lepidopterists' Society



39th Annual Meeting
14-17 July 1988

THE CARNEGIE
Museum of Natural History

Welcome to the 39th Annual Meeting of The Lepidopterists' Society and to The Carnegie. The Carnegie Museum of Natural History is unusual among the world's larger museums in that it was founded by a lepidopterist, and fostered by directors who were lepidopterists for more than half of its history. The first director of the Museum, and the first chancellor of the University of Pittsburgh was William J. Holland. Holland's The Moth Book and The Butterfly Book were published in the first decade of this century, and have contributed greatly to popularizing the study of Lepidoptera. Holland was replaced as director of the Carnegie by Andre Avinoff, a talented Russian emigre with a flair for painting and a fondness for Parnassius. Many of The Carnegie's entomological curators were lepidopterists, including Walter Sweadner with an interest in moths, Richard Fox of ithomiine fame, and more recently a lover of lycaenids and founding member of The Lepidopterists' Society, Harry Clench.

Most sessions of the meeting will be held in David Lawrence Hall, Room 120, of the University of Pittsburgh, directly across from the dormitories. The Executive Council meeting on Thursday afternoon, July 14, will be held in the Blue Classroom in the basement of The Carnegie Museum of Natural History. The insect portion of the collection in the Section of Invertebrate Zoology will be open before, during, and after the meeting. The Lepidoptera are housed in the Holland Room at the rear of the third floor of the Natural History building. About 1.6 million moths and butterflies are housed in the Holland Room, most of them unexamined by knowledgeable specialists. When entering The Carnegie to visit the collections, show your Lepidopterists' Society Identification Badge to security guards so that you can pass.

With its long history of collection and research on Lepidoptera, The Carnegie is pleased and proud to host an annual meeting of the premier association for the study of moths and butterflies, The Lepidopterists' Society. Welcome!

INFORMATION OF INTEREST TO ALL

TRANSPORTATION (see pages 29 and 30 for detailed information and map)

To and From Pittsburgh Airport: Limousines from the Pittsburgh airport to Oakland depart every hour on the hour from 9am to 9pm, Mon-Fri, and from 2-9 pm on Sunday. There is no Saturday service to Oakland. Cost is $8.50. The limos stop at University Inn (corner of Forbes and McKee Place) and Webster Hall (5th and Dithridge) in Oakland; Webster Hall is closer to the dormitories. If you ask nicely, the driver may make a drop off at the dorms as they are between the above two points. From Oakland to the airport, limo service departs from University Inn on the hour and from Webster Hall at 10 minutes before the hour. Make reservations at least 2 hours in advance to be picked up at Webster Hall (471-8900). Taxis from the airport cost $25-30; ask around at the limo pick-up area for others heading for Oakland and you may be able to form a group to share a cab. Forget about public transportation to the airport.

Arrival by Car:

1. From the N, NW, S, or SW, take I-79 to I-279, following signs to Pittsburgh. Continue on I-279 through Ft. Pitt tunnel; at this point, be in the right-hand lane. Immediately after tunnel, cross over Ft. Pitt bridge and exit onto I-376 (signs to Monroeville). Stay in right-hand lane on I-376 for about 1 mile and take Oakland exit onto Forbes Ave (one-way traffic). Follow Forbes for several blocks to University of Pittsburgh dormitories, the Litchfield Towers (2 tall, round buildings) on your left. For parking, continue past dorms to city parking lot on right side of Forbes in front of The Carnegie Library. Meters are in effect 24 hrs/day; $0.25 for 1/2 hour, 4 hours maximum. This is for dormitory check-in purposes only.
2. From the E or SE, take I-76 (PA Turnpike) to I-376, following signs to Pittsburgh for about 10 miles to Oakland exit. Go straight at exit, through stoplight and continue straight on Bates St., until a T-intersection. Turn left at "T" to first stoplight, which is Forbes Ave. Turn right, and dormitories are the tall round buildings on the left side of Forbes. See above for check-in parking.

Arrival by Bus: From the bus station in downtown Pittsburgh, the easiest way to Oakland is by taxi, which costs $6-7.

REGISTRATION

Registration will take place from noon to 5 pm on Thursday, July 14, at tables immediately outside the meeting room, David Lawrence Hall 120. This is directly across Forbes Avenue from the dormitories, and can be reached by crossing the enclosed pedestrian crossing over Forbes.

Registration will continue from 7:30 -10:00 pm on Thursday evening at the reception/open house at the Section of Invertebrate Zoology, The Carnegie Museum of Natural History. From the dormitories, walk on Forbes Avenue to The Carnegie, turn right just before reaching the building and walk along the front of the Carnegie Library, then bear left around the building to the arched security entrance off the rear parking lot. Pass through the archway, identify yourself as a lepidopterist to any curious security guards, and follow the Lepidopterists' Society signs to the rear elevator. Take the elevator to the third floor, which opens directly outside the insect collection.

Late registration will continue all day Friday outside David Lawrence Hall 120.

After registration, you should have a meeting program with your name on it, an identification card, tickets for the picnic and banquet as required, and any additional information about the meetings.

DORMITORY FACILITIES AND CHECK-IN

We have made arrangements with the University of Pittsburgh for dormitory facilities. The dormitories are clean, economical accommodations located directly across Forbes Avenue from the meeting rooms. Unlike some dormitory accommodations, these operate more or less like a hotel. You only need to buy the cafeteria meals you want, and you can easily come early and stay late with no special arrangements.

When you arrive at the meeting, you should check in at the dormitory and obtain information on cafeteria services and confirm your lodging arrangements. Cafeteria food is of good quality and quite cheap. Meal tickets for each meal are purchased as required at the main dormitory office in the lobby immediately above the cafeteria. Breakfast is $2.50, lunch is $3.50, dinner is $5.00, and brunch is $3.90. We recommend the breakfasts!

For those wishing to come early and stay late, please note that you can make dormitory reservations for extended periods, not just for July 14-17. You should ask about these arrangements as you check in.

Because we realize that many persons are attending this meeting to examine our collections, the Holland Room will be open to all visitors from 8 am to 5 pm, Thursday, Friday, and Saturday. Walt Zanol will be continuously in the collections, and will attend to needs and answer questions.

PARKING

Parking in the Oakland area is not particularly easy or cheap, especially due to construction in the dormitory parking lot and high parking rates at many other nearby lots. We do not recommend you use The Carnegie parking area behind the Museum due to crowds and traffic congestion resulting from the Dinosaurs Alive exhibition.

For those checking into the dormitories, temporary parking is available in the small area behind the University of Pittsburgh bookstore next to the dormitories. The entrance to this small area is found by heading west on Fifth Avenue (one way) and turning left at the Bookstore. When checking into the dormitory, be sure to ask the attendant for information on local parking. Additional information is supplied on page 28 of this program.

Parking on Thursday and Friday until 5 pm. Perhaps the cheapest parking available is the Atwood Street Parking Lot with a cost of approximately $7.00 per day.

Parking on Friday evening after 5 pm and through the weekend. FREE, secure parking can be had by all members of the Lepidopterists' Society at the Morewood Lot of Carnegie Mellon University. This lot is less than one block from The Carnegie, and only 3 blocks from the dormitory at the University of Pittsburgh. To get there, go east on Forbes Avenue from the dormitories for two blocks when you will pass The Carnegie on the right. Continue straight on Forbes for one block over a small bridge and turn left into the parking lot immediately adjacent to the bridge. The Morewood lot may

be used only by cardholders until 5 pm on Friday, but after that time is open throughout the weekend. For those parking elsewhere on Thursday and Friday, we suggest you move your vehicle to the Morewood lot on Friday evening after the barbecue to be sure you obtain free parking for the rest of the meetings. (See page 28 for further information on parking).

DOOR PRIZES

A highlight of every annual meeting is the awarding of door prizes choreographed by Charlie Covell following the banquet on Saturday evening. This year is no exception, and we hope that many members remembered our need for prizes, great or small. Please give your prizes to Charlie before the drawing! Be sure to hang onto your banquet ticket, as the number on it could result in fame and fortune.

SLIDE SHOW

Although preregistration interest in a photography contest was not sufficient to warrant holding one formally, please remember to bring any slides you might wish to share with your fellow lepidopterists. There will be a showing at David Lawrence Hall opposite the dormitory after the picnic (9:30 - 10:30).

FIELD TRIPS

We have organized three different field trips to assist you in collecting and observing Lepidoptera after the meetings.

PENNSYLVANIA: MOTH AND BUTTERFLY SOIREE AT POWDERMILL NATURE RESERVE - This event will take place in forest habitats in western Pennsylvania near Laurel Ridge in the Allegany Mountains. It will be held on Sunday evening, July 17, and Monday, July 18, at The Carnegie Museum of Natural History's field station, Powdermill Nature Reserve. We are calling this gathering the "Moth and Butterfly Soiree" and urging all persons to attend. It will start at Powdermill on Sunday evening with an evening cookout at Raven's Roost, a large cabin on the Reserve. We have reserved Raven's Roost and two rustic cabins (aptly named the Avinoff and Holland Cabins) for those who wish to collect moths and to camp-out for the night. We can accommodate about 36 persons in the cabins, and any others that have campers, tents, or environmental tolerance! Breakfast will be served the following morning, and butterflies may be observed and collected in the Reserve or in adjacent park areas. There will be no charge for food or accommodations, rustic as they will be!

OHIO AND THE RESTHAVEN WILDLIFE AREA - Ohio lepidopterists Eric Metzler and John Leland will lead a field trip on Monday and Tuesday, July 18-19, to the Resthaven Wildlife Area in Erie County, Ohio. This is about 50 miles east of Toledo near Sandusky, an easy trip from Pittsburgh via the turnpike. Resthaven is an area of remnant upland and wet prairies intermixed with freshwater marshes bordering Sandusky Bay. It is one of Eric Metzler's favorite spots for mothing! For those attending the Powdermill Soiree and travelling west, this would be an ideal next stop. Participants will be received at Resthaven at noon and later on Monday, as well as on Sunday evening for those heading west immediately after the meeting. Organizational details, maps, and further information will be provided at the Pittsburgh meeting. Ask Eric Metzler for information on additional localities in southern Ohio where saturniids and Catocala abound!

WEST VIRGINIA AND THE BACKBONE MOUNTAIN BOGS - Two friendly coleopterists, Carnegie's Bob Davidson and Research Associate Bob Acciavatti (US Forest Service), will lead a two day field adventure into some little visited bog habitats in north central West Virginia. They will depart from the Carnegie Museum of Natural History in Pittsburgh at noon on Monday, July 18. The first site will be Olson Bog in north central West Virginia in the Backbone Mountains, about 3 hours drive south of Pittsburgh. Nocturnal collecting should be interesting at this infrequently collected site and adjacent montane habitats. Butterfly collecting will be possible during the day on Tuesday, July 19, and another evening of mothing will occur at a different site. Come prepared to capture some unusual species in these restricted habitats. Organizational details and directions will be available at the Pittsburgh meeting.

BASIC FACTS AND PHONE NUMBERS FOR PITTSBURGH

Population	0.5 million city; 2.3 million metro
Altitude	710 to 1370 feet
Area code	412
Time zone	Eastern
Climate	Ave. July-August high 83, low 61 degrees

Important phone numbers

Emergency	911
Police (non-emergency)	765-1212
Time	391-9500
Weather	936-1212
Tourist Information	281-9222
"What's Going On"	391-6840 (recording of daily events)

Local Transportation

Yellow Cab	665-8100
Peoples Cab	681-3131
Buses (PAT)	231-5707
Airport Limousine	471-8900

Sightseeing Tours

Gray Line	741-2720
Gateway Clipper Fleet	355-7979
Pittsburgh All-Day Tours	687-8687

CLOTHING

It will be warm at the very least, perhaps even hot, with evenings to match. We suggest casual wear and light clothing for all events, although for late night strolls a light jacket might be useful. Some may wish to dress up a bit for the banquet. An umbrella is also a good idea, especially if we are fortunate enough to experience one of Pittsburgh's electrifying electric storms!

THURSDAY MORNING & AFTERNOON, JULY 14

9:00 - 5:00 OPEN HOUSE - Section of Invertebrate Zoology
Third Floor, The Carnegie Museum of Natural History

12:00 - 5:00 REGISTRATION - David Lawrence Hall 120

1:00 - 5:00 EXECUTIVE COUNCIL MEETING - Blue Classroom, basement of The Carnegie Museum of Natural History. Follow the signs that say "EXECUTIVE LEPIDOPTERISTS".

THURSDAY EVENING, JULY 14

7:30 - 10:00 Welcoming Reception, Open House, and Continuing Registration- Section of Invertebrate Zoology, The Carnegie Museum of Natural History

Location of all sessions:
Room 120, David Lawrence Hall
University of Pittsburgh

FRIDAY MORNING, JULY 15
David Lawrence Hall, Rm. 120

8:45 ANNOUNCEMENTS - J.E. Rawlins

8:50 WELCOME - Dr. James King, Director
The Carnegie Museum of Natural History

SESSION ONE - SYSTEMATICS AND EVOLUTION
R.L. Brown, presiding

9:00 (1) ELLIPTICAL GOLDENROD GALL MAKER, GNORIMOSCHEMA GALLAESOLIDAGINIS (RILEY), DISCOVERED TO BE SIBLING SPECIES (GELECHIIDAE)
W.E. Miller (Dept. Entomology, Univ. Minnesota, Minneapolis, MN)
The maker of this familiar stem gall of old-field goldenrods (Solidago) has been taxonomically stable for a century. Larvae chew a moth-escape hole through the gall wall, then cap it with a hard, secreted bung. Sibling evidence includes: S. gigantea galls have black bungs, S. canadensis-complex galls, white bungs, opposites occurring less than once per 300 galls; larvae transferred between hosts show bung color is inherent, not host determined; black- and white-bung interiors differ; black- and white-bung larval phenology and adult wing patterns differ slightly. Sibling genitalia are identical, but few congeners are genitalically distinct. In 55 old fields in 6 midwestern states, 65% of galls had white bungs, 35% black, closely parallelling respective host abundance. The black-bung maker will be named Gnorimoschema gigantis.

9:15 (2) THE EVOLUTION OF NORTH AMERICAN BLASTOBASIDAE (LEPIDOPTERA: GELECHIOIDEA).
D. Adamski (Miss. Ent. Mus., Miss. St. Univ., Mississippi State, MI)
Biological features of the Blastobasidae (Lepidoptera: Gelechioidea) are discussed within an historical framework ranging from typological thinking to evolutionary thinking. Genitalic morphological characters are most important for estimation of phylogenetic relationships within and among evolutionary clades, however, several characters on other body regions have also proven useful. Based upon host data gathered from reared specimens and data from acorn feeders in Mississippi, phytophagous strategies appear to be as numerous as opportunistic scavenger strategies within the family.

9:35 (3) PHYLOGENY OF MYSCELIA, NESSAEA, AND CATONEPHELE (EURYTELINAE, SUBTRIBE CATONEPHELINA)
D.W. Jenkins (Allyn Museum of Entomol., Florida State Museum, Sarasota, FL)
Unresolved problems remain concerning the validity and relationships of Myscelia, Nessaea and Catonephele. Some earlier authors combined some of the genera. Cladistic analyses were carried out at three taxonomic levels: subfamily Eurytelinae, subtribe Catonephelina and at generic levels, evaluating binary characters versus multistate characters. Cladograms using different methodologies for the three levels produced similar strongly bifurcate branches indicating Myscelia to be polyphyletic. One branch included the Myscelia orsis species group and Nessaea, and the other branch included Catonephele and the Myscelia cyaniris species group. Various options including a new genus Catocelia are discussed.

9:55 (4) THE BIGGER AND BETTER GENUS ATALOPEDES (HESPERIIDAE)
J.M. Burns (N.M.N.H., Smithsonian Institution, Washington, D.C.)
What makes Atalopedes bigger and better is the addition of two tropical species, an undescribed one plus its misplaced sister, and the subtraction of another, nabokovi (Bell & Comstock), which belongs in Hesperia. I compare Atalopedes with its sister genus Hesperia, compare the species of Atalopedes with one another, review their largely allopatric geographic distribution as well as the ecology of the added species, and discuss the phylogeny of the entire genus.

10:15 (5) THE HIGHER CLASSIFICATION OF THE RIODINIDAE
D.J. Harvey (Dept. Entomol., N.M.N.H., Smithsonian Institution, Washington, D.C.)
The Riodinidae is the most poorly known group of butterflies in terms of both its systematics and biology. A new higher classification of the group is proposed, based on characters of adult and immature stages. Five monophyletic subfamilies are recognized: Styginae, Hamearinae, Euselasiinae, Corrachiinae, and Riodininae. The relationship of the riodinids to other groups is discussed.

10:35 BREAK

SESSION TWO - ALL ABOUT FOOD
S. Borkin, presiding

10:50 (6) ADULT NUTRITION AFFECTS MALE VIRILITY IN PAPILIO GLAUCUS
R.C. Lederhouse, M.P. Ayres, and J. M. Scriber (Dept. of Ent., Mich. St. Univ., E. Lansing, MI)
Newly-emerged, lab-reared P. glaucus males were allocated to four different diets: (1) dilute honey water (20% by weight), (2) honey solution supplemented with electrolytes (lepidopteran ringers), (3) honey solution supplemented with amino acids (0.5% casein hydrolysate), or (4) honey solution supplemented with electrolytes and amino acids. Males were given the opportunity to hand-pair after 2 days of feeding and then at 2 day intervals to a maximum of four opportunities. Diet affected their likelihood of pairing and the hatching success of their offspring; their longevity was not affected. Both electrolyte treatments were more likely to couple, but only males receiving both electrolytes and amino acids had higher larval hatch than honey-water controls. The cumulative effect was a 5-fold increase in hatchlings per male for electrolyte/amino acid males versus control males. We currently feed males supplemented honey-water on alternate days and have much improved fertility from pairings with lab-reared males. Reports of low fertility in pairings with lab-reared males are as likely to be related to male nutrition as to genetic incompatibilities.

11:10 (7) CURIOUSER AND CURIOUSER: OLD AND NEW HYPOTHESES ABOUT HOSTPLANT SPECIFICITY IN PIERINE BUTTERFLIES
F. Chew (Dept. of Biology, Tufts Univ., Medford, MA)
Crucifer-feeding pierine butterflies respond to many plants that contain glucosinolates (mustard oil glucosides) by feeding or laying eggs. But what about the crucifers they avoid? Recent evidence suggests that responses to glucosinolates are part of a more complex story. I review prevailing hypotheses about chemical mediation of hostplant specificity in pierines in light of recent evidence. I propose several testable hypotheses concerning how crucifer chemistry and responses of pierid caterpillars and adults may evolve.

11:25 (8) CONSEQUENCES OF HOSTPLANT SHIFTS FOR THE CHECKERSPOT, EUPHYDRYAS PHAETON (NYMPHALIDAE)
M.D. Bowers & N.E. Stamp (Museum Comp. Zool., Harvard Univ., Cambridge, MA; Dept. of Biol. Sci., S.U.N.Y., Binghampton, NY)
In recent years, populations of E. phaeton have been found that use Plantago lanceolata (Plantaginaceae) instead of the usual hostplant, Chelone glabra (Scrophulariaceae). We compared individuals from populations using these two different hostplants for their growth, survival, and digestive efficiency on both hostplants, hostplant preference, diapause weight, and pupal weight. In general, larvae from both populations performed better and preferred C. glabra. In addition, these insects sequester iridoid glycosides from their hostplants, which render them unpalatable. The compounds found in the two hostplant species differ, thus butterflies that have fed as larvae on these two hostplants vary in their degree of chemical defense.

11:45 (9) SPHINGID MOTHS AND THEIR FOOD PLANTS IN TAIWAN
C.S. Lin (National Museum of Natural Science, Taichung, Taiwan, ROC)
There are 75 species and 35 genera of sphingids in Taiwan. On the basis of host plants the Sphingidae can be roughly separated into 2 subfamilies and 5 tribes. These tribes appear to reflect taxonomic divisions within the family. Information on host plants may provide a basis for the classification of the Sphingidae in Taiwan. Protective allelochemicals play a leading role in determining patterns of food plant utilization. A detailed examination of the sphingid detoxification system may answer the question as to whether or not these tribes have a phylogenetic basis.

12:00 LUNCH

FRIDAY AFTERNOON, JULY 15
David Lawrence Hall, Rm. 120

SESSION THREE - BIOGEOGRAPHY
D. Harvey, presiding

1:30 (10) THE PENINSULAR EFFECT: FROM DOGMA TO DOGMEAT
J.W. Brown (Dept. Entomological Sci., Univ. Calif., Berkeley, CA)
The "peninsular effect" can be summarized as follows: Species density (richness) decreases as a function of distance from the mainland base of a peninsula. Identified by Simpson in 1964, this pattern was initially corroborated by studies on several North American vertebrate groups. However, several invertebrate groups recently studied in Baja California (i.e., scorpions, butterflies, and sphingids) exhibit density patterns contrary to that predicted by the peninsular effect. For Lepidoptera, patterns of floral diversity (community complexity), proximity to mainland species pools, and past geological events apparently override any peninsular effect. The peninsular effect has proven to be an occasional phenomenon rather than a biogeographic principle.

1:50 (11) CHARACTERS, BIOGEOGRAPHY AND NATURAL GENERIC LIMITS IN THE EUMAEINI(LYCAENIDAE)
K. Johnson (Dept. Ent., Amer. Mus. Nat. Hist., New York, NY)
Surveying large unidentified/unincorporated collections indicates most described Eumaeini species (e.g. sensu Seitz) are members of much larger, undescribed, monophyletic groups. When delimited, these groups exhibit various "classic" distribution patterns and are basic to higher eumaeine classification (not simply clustering presently-known species). Workers needn't make subjective (or weighted) character/OTU groupings. In standard numerical cladistic matrices, including every entity sharing a group of major structural characters, a generic level OTU will usually portray a "classic" geography and its sister group either (i) repeat this pattern or (ii) diverge to another. If desirable, subsequent cladistics can reduce such genera to subgenera without information loss.

2:10 (12) NEARCTIC AGLAIS AND NYMPHALIS (LEPIDOPTERA: NYMPHALIDAE): LAURASIA REVISITED?
L.D. Miller and J.Y. Miller (Allyn Museum of Entomol., Florida State Museum, Sarasota, FL)
The taxonomy of Nearctic Aglais and Nymphalis is discussed. The single species of Aglais remains doubtfully distinct from its Palearctic sister species; all of the Nearctic Nymphalis are conspecific with Palearctic species. The biogeography of these insects is discussed with regard to vicariance biogeography vs. Pleistocene dispersal. Because of extant fossils, the group is considered to be ancient and probably predates the final breakup of Laurasia.

2:25 (13) BIOGEOGRAPHY OF THE MICROPTERIGIDAE
G.W. Gibbs (Victoria Univ., Wellington, New Zealand)
This world-wide group of small moths has two foci of diversity in the modern world, one in Europe and one in the SW Pacific. The Pacific focus is centered on New Caledonia with related forms around the Pacific rim. These moths might normally be regarded as a "Gondwanic" group but is this interpretation applicable? Interpretations of the distribution and phylogenetic data will be discussed with reference to the evolution of Lepidoptera.

2:45 BREAK

SESSION FOUR - FAUNISTICS
J. Lane, presiding

3:00 (14) THE OLYMPIAN MARBLE (EUCHLOE OLYMPIA, PIERIDAE) IN NEW YORK STATE
J.F. Cryan & R. Dirig (N.Y.S. Dept. of Environmental Conservation, Long Island City, NY; Bailey Hortorium Herbarium, Cornell Univ., Ithaca, NY)
The olympian marble (Euchloe olympia, Pieridae) is reported for the first time from New York State (and the northeastern United States). It occurs at two sites in Jefferson County on open, windswept limestone pavement, locally known as alvar. A rare rock cress (Arabis divaricarpa, Cruciferae) is the larval foodplant of this univoltine, May-flying butterfly in New York. E. olympia is one of several rare species occupying these biologically rich alvar sites; others include several calciphilic vascular plants and a lichen with midwestern prairie affinities.

3:15 (15) NEW LEPIDOPTERA RECORDS FROM WYOMING WILDERNESS AREAS AND THEIR USE IN LONG RANGE WILDERNESS MANAGEMENT PLANS.
K. Bagdonas (Dept. Zool. & Physiol., Univ. Wyoming, Casper, WY)
Since 1984, Bagdonas' Flying Circus (the BFC) has been conducting extensive lepidopteran surveys in northwestern Wyoming wilderness areas under the auspices of the National Audubon Society's Wilderness Research Backpack Program. The Fitzpatrick and Washakie Wildernesses in the Wind River and Absaroka Mountains have been especially rich in new Lepidoptera records. As a result, the U.S. Forest Service and Wyoming Game and Fish Department are using many of these new records in the preparation of long range management plans for these wildernesses. Species of particular importance to these agencies include Boloria improba, B. napaea, Hypodryas gillettii, Carterocephalus palaemon, Erebia magdalena, various Oeneis, and numerous moths.

3:35 (16) BUTTERFLIES IN THE ALLEGHENY NATIONAL FOREST, PENNSYLVANIA
J. Prescott (Erie, PA)
The Allegheny National Forest is located in northern Pennsylvania. The original climax condition of the forest and the butterflies collected in the area has changed over the years due to settlement, development, forest management and increased deer populations. This is the result of a fifteen year survey of the butterflies in the forest area. Seventy species are listed and their seasonal occurrences presented. This represents about half the number of species known to occur in the state. Comparisons of the state species list with that of the forest area will be discussed.

3:55 (17) MOTHS OF SPECIAL CONCERN IN OHIO (LEPIDOPTERA: SATURNIIDAE, SPHINGIDAE, AND ARCTIIDAE) WITH NOTES ON SPECIES OF SPECIAL INTEREST
E.H. Metzler & V.P. Lucas (Columbus, OH)
Seven families of Lepidoptera in Ohio are evaluated. No species are considered Endangered or Threatened. Four species are of Special Concern. The Status is Unknown for four species. Twelve species are of Special Interest. Two threats are identified: habitat destruction and pesticide application for gypsy moth control. Most of the included species are associated with the Oak Openings of Lucas County, an area undergoing considerable change from housing, commercial and industrial development. Natural habitats must be protected and management practices preserving the openings should be adopted. Pesticide application in sensitive areas should be checked for impact on non-target species.

4:15 (18) NEOTROPICAL TIGER MOTHS NEW TO THE UNITED STATES FAUNA (ARCTIIDAE: CTENUCHINAE, LITHOSIINAE)
J.P. Donahue (Natural History Museum of Los Angeles County, Los Angeles, CA)
First U.S. records for six species are illustrated and documented from Texas or Arizona: 5 Ctenuchinae (Apeplopoda mecrida, n. comb.; Eucereon myrina, Eucereon sp., "Abrochia" leovazquezae, Poliopastea clavipes) and Lithosiinae (Rhabdatomis sp.).

4:30 (19) THE SILVERY BLUE (GLAUCOPSYCHE LYGDAMUS, LYCAENIDAE) IN NEW YORK STATE
R. Dirig & J.F. Cryan (Bailey Hortorium Herbarium, Cornell Univ., Ithaca, NY; N.Y.S. Dept. of Environmental Conservation)
Two subspecies of the silvery blue (Glaucopsyche lygdamus, Lycaenidae) are recorded from New York. The typical subspecies was recorded from central New York through 1969. Adults flew in May, and larvae fed on native wood vetch (Vicia caroliniana, Leguminosae) on steep, unstable, southwest-facing shale banks. G. l. couperi is reported for the first time from eight counties in northern New York. Here its larvae feed on tufted vetch (Vicia cracca), and adults fly in June on weedy road banks. The butterfly is spreading south using vetch-lined highway corridors.

FRIDAY EVENING, JULY 15

7:00 - 9:00 We have planned an informal, evening picnic at Camp David Lawrence in nearby Schenley Park. You can drive to the picnic, but dormitory residents may wish to stroll there leisurely (about 25 minutes walk). You get there by walking on Forbes Avenue toward The Carnegie, turning right past the front of the Carnegie Library, continuing over a bridge, past greenhouses on the right at Phipps Conservatory, over the Panther Hollow bridge, and swerve gently to the right past an overpass under construction. Just beyond the overpass, walk on the sidewalk to the right of the main road. This heads toward a wooded area and a sign with "Vietnam Veterans" on it. Get back on the edge of the paved road that rises slightly as it curves to the right. The road will soon curve left and you will arrive in front of a small wooden hut with a sign on the front - Camp David Lawrence. For those walking over, we will have some cars to shuttle persons back to the dormitories after picnicking has taken its toll.

9:30 - 10:30 Slide Show at David Lawrence Hall. Here is opportunity for eccentrics and artists to show their stuff.

SATURDAY MORNING, JULY 16
David Lawrence Hall, Rm. 120

SESSION FIVE - THE STUDY OF LEPIDOPTERA
J.Y. Miller, presiding

8:30 (20) THE OHIO LEPIDOPTERISTS: ON THE EVE OF OUR TENTH ANNIVERSARY
J.V. Calhoun (Westerville, OH)
The Ohio Lepidopterists, a non-profit organization of approx. 220 members, celebrates its tenth anniversary in 1989. A quarterly newsletter is a product of the very active membership. Projects include field trips, annual meetings, publications, a synoptic Ohio Lepidoptera collection and a sales program. Grants awarded to The Ohio Lepidopterists have contributed to a successful Ohio Survey of Lepidoptera and important research on endangered Lepidoptera in the state. Partially a result of the Survey, a publication on the butterflies and skippers of Ohio is in preparation. The organization is also an invited member of the Ohio Gypsy Moth Council. An enthusiastic membership ensures another rewarding ten years.

8:45 (21) ANNETTE FRANCES BRAUN: EARLY CONCEPTS IN LEPIDOPTERAN PHYLOGENETICS
M.A. Solis (Dept. Entomol., Univ. Md., College Park, MD)
Annette Braun described over 335 North American species and 16 genera in various families of microlepidoptera, most of which were reared and the descriptions included life history data as well as descriptions of the immature stages. She was a systematist who studied and described groups of organisms and then developed an hypothesis of relationship among them. Her work also defined and attempted to solve some of the major questions still facing many systematists today such as recognizing new characters, establishing homologies and analyzing character states (e.g. polarities, transformations).

9:05 (22) THE MAKING OF THE FIRST 'CHECKLIST OF THE LEPIDOPTERA OF AUSTRALIA'
E.S. Nielsen (CSIRO, Canberra, Australia)
This computerized Checklist is the first complete reference to the taxonomy, nomenclature and classification of the entire Australian fauna of Lepidoptera. It contains an Index listing all names ever associated with Australian Lepidoptera, including names previously used because of misidentifications or misspellings. The Checklist is based on: (1) an alphabetical index of all original descriptions of lepidopterans named from Australia; (2) an archive, as complete as possible, of colour transparencies of the corresponding primary types; (3) comparison of slides and type information with material in the Australian National Insect Collection and other collections plus other available data; (4) production of a computer database. The Checklist is multi-authored with one or more authors responsible for each family. The completed Checklist will be published in book form and the database kept updated.

9:25 BREAK

SESSION SIX - EVOLUTIONARY BIOLOGY
C. Covell, presiding

9:40 (23) PAPILIO HYBRIDS: HAND-PAIRINGS OF NORTH AND SOUTH AMERICAN SPECIES FROM SECTION III AND SECTION V (PAPILIONIDAE)
J. M. Scriber, R. Lederhouse (Dept. of Entomol., Mich. St. Univ., E. Lansing, MI) and K.S. Brown, Jr. (Universidade Estadual de Campinas, Sao Paulo, Brazil)
Male Papilio scamander from Campinas, Brazil were hand-paired to virgin P. glaucus and P. palamedes females. Egg viability was less than 10% for two glaucus-scamander crosses and 27% and 18% for palamedes-scamander crosses. Glaucus-scamander larvae developed to pupation on white bay, tulip tree and cucumber tree (Magnoliaceae) and black cherry (Rosaceae) but died on red bay (Lauraceae). Palamedes-scamander larvae developed to the last instar on red bay and camphor (Lauraceae), but none pupated successfully. One female and 3 male glaucus-scamander adults emerged. The degree of genetic compatibility between these Papilio group 3 and group 5 members is intriguing.

10:00 (24) THE FOSSIL VANESSA BUTTERFLIES (LEPIDOPTERA: NYMPHALIDAE) WITH THE DESCRIPTION OF A NEW SPECIES FROM THE FLORISSANT FORMATION (OLIGOCENE)
J.Y. Miller and F.M. Brown (Allyn Museum of Entomol., Florida State Museum, Sarasota, FL)
A review of the fossil butterflies previously described in the modern genus Vanessa is presented. Comparative study of two recently discovered fossil butterflies from Florissant (Oligocene) showed that they were related to extant Vanessa, especially V. indica Herbst, and warranted the description of a new species. The biogeographical implications of fossil Vanessa in light of this new species are briefly discussed.

10:15 (25) CHEMICAL DEFENSE SYNDROMES OF AMERICAN ACRAEINAE AND OF OTHER APOSEMATIC BUTTERFLIES
K.S. Brown, Jr. & R.B. Francini (Universidade Estadual de Campinas, Sao Paulo, Brazil)
Larvae and adults of American Acraeinae often feed upon sources of dehydropyrrolizidine alkaloids (sought by adult Danainae and Ithomiinae for defensive purposes) but do not store these toxins. All 22 species examined in the genera Actinote, Altinote and Abananote biosynthesize in all stages and store large amounts of the cyanogen linamarin. This syndrome is compared with that of the sister-group Heliconiini/Argynnini/Melitaeini which also biosynthesize cyanogens even though they are present in the larval hostplants. Apparently only the most primitive aposematic butterflies (Troidini, Pierini?, Eumaeus and a few Danaus) regularly store toxins from the larval hosts.

10:35 BREAK

10:45 (26) REASSESSING THE MIMICRY RELATIONSHIP BETWEEN VICEROY AND QUEEN BUTTERFLIES IN FLORIDA
D.B. Ritland (Dept. of Zool., Univ. Fla., Gainesville, FL)
Laboratory experiments using captive birds have refuted the traditional hypothesis that Florida viceroys (Limenitis archippus floridensis) are edible Batesian mimics of Florida queens (Danaus gilippus berenice). It now appears that the two butterflies are involved in a complex Muellerian relationship. Viceroys may frequently be "models" for poorly-protected queens -- laboratory birds learned to recognize and avoid viceroys after tasting them, and subsequently rejected the like-colored queen on sight. Queens rely on differing larval foodplants in different regions, and vary substantially in palatability. The mimicry relationship is therefore dynamic, and viceroys may be either models, mimics, or co-mimics of queens in different seasons and locales.

11:05 (27) VARIATION IN FLORIDA POPULATIONS OF EUREMA DAIRA (LEPIDOPTERA: PIERIDAE)
M.C. Minno & T.C. Emmel (Dept. Zool., Univ. Fla., Gainesville, FL)
A small percentage of male Eurema daira daira in extreme southern Florida have yellow forewings and white hindwings and resemble Eurema daira palmira from the Caribbean. Rearing the progeny of ten wild-caught females from the Upper Florida Keys resulted in a small proportion of bicolored individuals of both sexes in a few broods. Although palmira-like females did not occur among these progeny, we recently collected females of E. d. palmira from Big Pine Key. It appears that the bicolored individuals in south Florida populations of E. d. daira are due to introgression of alleles from E. d. palmira.

11:20 (28) POPULATION STUDIES OF BRAZILIAN BUTTERFLIES THREATENED WITH EXTINCTION
K.S. Brown, Jr. (Universidade Estadual de Campinas, Sao Paulo, Brazil)
A list is presented of forty presumably threatened butterfly species and subspecies, all good indicators of specific habitats and faunas in

the rapidly disappearing Brazilian Atlantic forests. Three highly restricted species of the five in the endemic brassoline genus Dasyophthalma, and both Brazilian Hyalyris (Ithomiinae) are included. Eight taxa including D. vertebralis, the Hyalyris, and Eurytides iphitas (generotype) have not been seen in over 50 years despite intensive searches and are legally, though probably not actually, extinct. Mark-recapture experiments and resource/habitat evaluations are discussed for Hypoleria fallens, Heliconius natteri, Perrhybris flava, Parides ascanius, Papilio himeros and Eurytides lysithous harrisianus.

11:40 GROUP PHOTOGRAPH - In front of The Carnegie Library

LUNCH

SATURDAY AFTERNOON, JULY 16
David Lawrence Hall, Rm. 120

PRESIDENTIAL ADDRESS

1:30 (29) LEPIDOPTERISTS...COLLECTORS AND BIOLOGISTS?
J.A. Powell (Dept. Ent. Sci., Univ. Cal., Berkeley, CA)
Collecting is an affliction that is as intractable as any virus, one for which there is no immunity nor cure. This discussion examines reasons why collectors collect Lepidoptera and inquires whether the addiction can be fulfilled if and when lepidopterists emphasize collection of biological or behavioral data instead of new subspecies and county records.

SESSION SEVEN - SYMPOSIUM ON HISTORICAL BIOGEOGRAPHY
J.E. Rawlins, presiding

2:00 (30) DISTRIBUTIONAL PATTERNS OF BUTTERFLIES AND MOTHS IN OHIO
E.H. Metzler, D.C. Iftner and L.L. Martin (The Ohio Lepidopterists, Columbus, OH)
The Ohio Survey of Lepidoptera has over 30,000 Ohio specimen records. Statewide coverage is excellent. Some species, i.e. Pieris rapae, are in every county, whereas one third (44 species) of Ohio's butterflies, e.g. Hesperia sassacus, and Poanes viator, are limited to twelve regions. The regional distribution of Euphyes dukesi indicates use of the Mississippi River and the Wabash River for recolonization after the last glaciation. Atrytonopsis hianna, Hesperia metea, Grammia figurata, Synedoida grandirena and other species are absent in the center of the state. These disjunct distributions are hard to explain. Additional regions are becoming apparent as more moth data is added.

2:30 (31) A REVIEW OF ISLAND BIOGEOGRAPHIC THEORIES, WITH A PLAUSIBLE COMPOSITE VICARIANCE/DISPERSAL MODEL FOR THE WEST INDIAN BUTTERFLY FAUNA
L.D. Miller and J.Y. Miller (Allyn Mus. of Entomol., Florida State Museum, Sarasota, FL)
Various biogeographic theories concerning the colonization of islands are briefly introduced, and the strengths and weaknesses of each are discussed. Current evidence for the geological history of the West

Indies is given. The fossil record of butterflies shows that some groups are much more ancient than previously supposed, thus bringing plate tectonic events into consideration. A composite vicariance/dispersal model is presented for the West Indian butterfly fauna and is shown to be a more reasonable alternative to either one or the other scenario.

3:00 (32) HISTORICAL BIOGEOGRAPHY OF MYSCELIA, NESSAEA, AND CATONEPHELE (EURYTELINAE, SUBTRIBE CATONEPHELINA)
D.W. Jenkins (Allyn Museum Entomol., Florida State Museum, Sarasota, FL)
A biogeographic model for Myscelia, Nessaea, and Catonephele is proposed based on recent revisions and hypotheses on phylogeny. Progenitors of Eurytelinae probably originated in the African-South American land mass. South America moved westward 80-90 my BP providing ample time for the 32 indigenous neotropical genera to evolve. Range expansion of Myscelia and Catonephele into Central America probably occurred in the Paleocene with isolation and speciation until the Pliocene Panamanian uplift with possible range expansion north and south. The Progression Rule is well illustrated by these three congruent genera, mutually supported by allopatric stepwise morphological series, present distribution in phylogenetic sequence and probable geological and climatic history.

3:30 BREAK

3:45 (33) OF MOTHS AND MOUNTAINS: A MONTANE BIOGEOGRAPHY OF NEOTROPICAL TIGER MOTHS
J.E. Rawlins, (The Carnegie Museum of Natural History, Pittsburgh, PA)
Distributional analysis of several mutually allopatric clades of neotropical tiger moths (Arctiidae: Melese, Malabus, Cissura, Hyperthaema, Bertholdia) reveals congruent patterns reflecting montane topography. Congruence is enhanced by restricting biogeographical analysis to clades inhabiting similar habitats at similar elevations. Temporal sequencing of major geological events is attempted using parsimony analysis of area cladograms, but is confounded by dispersal and unresolved phylogenies.

4:15 (34) HOLARCTIC BIOGEOGRAPHY OF NOCTUIDAE EMPHASIZING NORTH TEMPERATE SPECIES DISTRIBUTIONS
J.D. Lafontaine & K. Mikkola (Biosystematics Research Centre, Agriculture Canada, Ottawa, Canada; Dept. Zool., Univ. Helsinki, Helsinki, Finland)
A taxonomic review of all known or suspected species of Noctuidae with holarctic distribution patterns resulted in changes in status of more than eighty species. Fifteen species thought to have holarctic distributions were shown to be different species in the Nearctic and Palaearctic regions while 38 species were added to the list of species with holarctic distributions. The distributions and habitat preferences of these holarctic species differ significantly from those of species presently thought to be holarctic. The implication of these data to our understanding of holarctic distribution patterns is discussed.

4:45 (35) HOMOLOGY AND HOMOPLASY IN THE BUTTERFLIES OF COLD CLIMATES: DARWIN'S LAW AS ILLUSTRATED BY PIERIDAE, ETC.
A.M. Shapiro (University of California, Davis, CA)
Darwin's Law states that "Nature will tell you a direct lie if she can." Extensive convergence in superficial characters has occurred in the butterflies of arctic and alpine environments, and disentangling it from phylogenetic affinities can be a very difficult matter. Bloch's Corollary of Darwin's Law adds that "Evolutionists will lie to you too, if they can." Examples are given from the Pieridae (Pierini and Coliadini), Satyridae and Nymphalidae (primarily Argynnini) and from their treatment in the systematic and biogeographical literature. The emphasis will be on the profundity of our ignorance even in allegedly well-worked groups.

5:15 ORGANIZATIONAL MEETINGS FOR FIELD TRIPS (See page 4 of this program)

SATURDAY EVENING, JULY 16

Banquet festivities will occur in the Faculty Dining Room on the main floor of Skibo Hall, Carnegie Mellon University. If you are walking from the dormitories (about 20 minutes) take Forbes Avenue past the entrance to The Carnegie parking facility. Continue on Forbes to the next traffic light. Skibo Hall is the first building on the right <u>past</u> the traffic light. There is a parking lot between it and Forbes Avenue. If you are driving, park in either the Morewood parking lot (see page 3) or the lot directly in front of Skibo Hall.

6:30 SOCIAL HOUR

7:30 BANQUET

8:30 PRESENTATION OF AWARDS

9:00 (37) <u>Karl Jordan Medal Address</u>. EARLY STEPS TOWARDS AN EVOLUTIONARY SUCCESS: THE STRUCTURE AND PHYLOGENY OF THE LOWEST LEPIDOPTERA
Niels P. Kristensen, (Zoologisk Museum, Copenhagen)

9:45 DOOR PRIZES - Charlie Covell in charge!

SUNDAY MORNING, JULY 17
David Lawrence Hall, Rm. 120

SPECIAL SESSION - PUBLICATIONS OF THE SOCIETY

8:30 (38) Open Forum on Issues Concerning Society Publications
Moderator J.E. Rawlins with Editors W.E. Miller, J.D. Preston, and C.V. Covell, and Publications Coordinator R. Leuschner

SESSION EIGHT - MORPHOLOGY AND ITS INTERPRETATION
F. Stehr, presiding

9:15 (39) RELATION OF LIGHT INTENSITY AND SPECTRUM TO PAPAGEORGIS' SEQUENCE OF WING COLOR PATTERNS AND FLIGHT LEVELS IN VEGETATION
B.H. Landing (Los Angeles, CA)
Papageorgis (1975) described layering of flight zones of butterflies with five wing color classes, from full shade to full sun, in Amazonian forest. The same sequence is seen in the progressive "dropout" of color classes going into lower vegetation (Landing, 1984). Graphic analysis of fit of Lee's 1987 data on light intensity and spectral pattern at four levels in tropical forests, to Papageorgis', indicate intensity is more important than spectrum, but fits of slopes of data curves are best to a ratio of intensity to spectrum, suggesting butterflies may use both to find and keep preferred levels of flight in vegetation.

9:35 (40) THE DISTRIBUTION, STRUCTURE, AND PUTATIVE ROLES OF MALE SEX SCALES IN THE PRIMITIVE LEPIDOPTERA
D.L. Wagner (Dept. of Ecol. & Evol. Biol., Univ. Conn., Storrs, CT)
The distribution and morphology of male sex scales or androconia is examined in the Zeugloptera through Monotrysia. Their occurrence in the Hepialidae is examined in detail. Five structurally unrelated types of androconia are found among the approximately 17 of 70 hepialid genera (24%) and 131 of the 500 species (26%). Male scent scales appear to be evolutionarily labile even within genera. The putative roles of androconia in the reproductive biology of hepialids are discussed.

9:55 (41) EVOLUTION OF ANTENNAL CLEANING BEHAVIORS IN BUTTERFLIES
R.K. Robbins (N.M.N.H., Smithsonian Institution, Washington, D.C.)
Lepidoptera use their legs to clean antennae, and leg cleaning structures have been used in butterfly classification for over a century. I report variation in antennal cleaning behavior and leg cleaning structures, including a previously unreported foretibial brush in some pierids. I use these results to assess proposed phylogenies to the butterfly families.

10:15 (42) ON THE WING MARKINGS OF HESPERIIDAE WITH SPECIAL REFERENCE TO THE HYALINE SPOTS
H. Chiba (Dept. Entomol., Univ. Hawaii, Honolulu, HI)
The wing markings of Hesperiidae are generally of earthen tones. Many of the patterns are an assortment of hyaline spots scattered on the dark background. The hyaline spot is composed of wing scales morphologically different from the normal wing scales. In butterflies, scales are regularly arranged in rows and overlap one another as shingles on a roof. However, scales in the hyaline spot are distributed randomly and erect perpendicular to the wing membrane. Morphological and developmental consideration of this modified scale is discussed.

10:30 (43) PITFALLS IN THE IDENTIFICATION OF LARVAL SPODOPTERA SPP. IN HONDURAS
S. Passoa (Univ. Illinois, Urbana, IL)
Although several good keys exist to identify Spodoptera spp. based on larval coloration, the extreme variability of the body markings can sometimes cause confusion and misidentifications. This paper illustrates those forms likely to be misidentified and mentions additional characters which were previously known but not utilized in most keys. Biological information is given on Spodoptera androgea (Cramer) which sometimes can be common on plants grown in greenhouses.

10:50 BREAK

11:00 BUSINESS MEETING, President J.A. Powell, presiding

12:00 ADJOURNMENT

SUNDAY AFTERNOON, JULY 17

3:00 Persons needing rides to the Powdermill Soiree, meet at the Section of Invertebrate Zoology, The Carnegie Museum of Natural History.

CAMPGROUNDS

Camping facilities are limited within the greater Pittsburgh metropolitan area. The nearest are listed below; there other state parks and campgrounds around 2 hours driving time from Pittsburgh.

	Estimated Driving Time from Pittsburgh
Buttercup Campground (Butler, PA; 412-789-9340) 200 sites; electricity; sewer N of Pittsburgh; PA 8 best route	45-60 minutes
Covered Bridge Campground (Washington, PA; 412-222-9830) 40 sites; electricity; sewer SW of Pittsburgh; I-79 to I-279 to Pittsburgh	40 minutes
Fox Den Campgrounds (New Stanton, PA; 412-925-7054) 250 sites; electricity; RV sites SE of Pittsburgh; I-76 (PA Turnpike) exit	40 minutes
Ohiopyle State Park (Ohiopyle, PA; 412-329-8591) 223 Class A campsites SSE of Pittsburgh; US 119 to I-76 to I-376	1.5 hrs.
Pittsburgh North KOA (Evans City; 412-776-1150) 94 sites; electricity; sewer N of Pittsburgh on I-79 or US 19	45 minutes
Raccoon Creek State Park (Frankfort Springs; 412-899-3611) 161 sites; electricity W of Pittsburgh on US 30	1 hour
Twilight Campground (Charleroi; 412-483--6235) 70 sites; electricity; RV sites S of Pittsburgh on PA 88	45 minutes
Washington KOA (Washington, PA; 412-225-7590) 61 sites; electricity; sewer SW of Pittsburgh; I-79 to I-279 to Pittsburgh	40 minutes

HOTELS AND MOTELS
(prices do not include 9% tax, which applies to all in Pittsburgh)

Oakland (within walking distance of the University of Pittsburgh and Carnegie Museum of Natural History)

Howard Johnson, University Center Hotel, 3402 Blvd. of the Allies, Pittsburgh, PA 15213 (412-683-6100; 800-245-4444; in PA call 800-441-3979)
119 units; $60 single, $65 double. Restaurant.

University Club, 123 University Place, Pittsburgh, PA 15213 (412-621-1890)
40 units; $60-70 single, $80 double (mention attendance at meeting at CMNH)

University Inn, 3454 Forbes Ave., Pittsburgh, PA 15213 (412-683-6000)
208 units; $80 single or double. Restaurant.

General Vicinity	Est. Driving Time to Oakland
Best Western - Parkway Center Inn; I-279 at Greentree Rd. (412-922-7070; 800-525-1234). Restaurant. AAA listed. 151 units; weekdays $65 single, $75 double; Fri. & Sat singles & doubles $45	20-25 minutes
Comfort Inn; Rts. 22 & 30 West at Rt. 60 Interchange (412-787-2600; 800-228-5150). Restaurant. AAA listed. 75 units; $32 single, $34 double, $40 for four	30-45 minutes
Envoy Inn - Monroeville; near I-376 & Turnpike Exit 6 (412-856-1610; 800-227-7378). Restaurant next door. 107 units; $32-38 single & double	30-40 minutes
Red Roof Inn -- at least 3 motels in Pittsburgh area (800-848-7878). $30-37 single, $38-40 double	varying
William Penn Motel; near Turnpike Exit 6, Monroeville (412-373-0700). Restaurants nearby. AAA listed 22 units; $30 single, $35-42 double	30-40 minutes
Pittsburgh Hilton; Gateway Center, downtown Pittsburgh (412-391-4600; 800-HILTONS). Full-service hotel. 752 units; $95-125 single & double	10-20 minutes
Vista International; Penn Ave., downtown Pittsburgh (412-281-3700). Pittsburgh's newest hotel. 616 units; $100-180 single & double	10-20 minutes

Pittsburgh Bed & Breakfast (2190 Ben Franklin Dr., Pittsburgh, PA 15237, 412-367-8080) -- Clearinghouse for various establishments; call or write for details.

RECREATIONAL ACTIVITIES IN PITTSBURGH

Oakland - This is the area in and around the University of Pittsburgh, Carnegie Mellon University, and The Carnegie.

The Carnegie includes the Museum of Natural History and the Museum of Art (closed Monday; open until 9 pm on Friday). Brochures included in registration packet. Don't miss Dinosaur Hall or the special exhibit Dinosaurs Alive of mechanized dinosaurs.

The Nationality Classrooms in the Cathedral of Learning at the University of Pittsburgh (624-6000) were designed by people from the nations represented. The classrooms are used regularly for teaching; call for tour times. The 42-floor Cathedral of Learning is supposedly the only skyscraper college building in the U.S. (don't tell the folks with the Univ. of Texas tower or the UC Berkeley Campanile that), surpassed only by the University of Moscow at the world level. There is no observation deck.

Phipps Conservatory in adjacent Schenley Park (255-2376) offers 2.5 acres of greenhouse plantings plus seasonal flower shows and an outdoor garden. The park itself is about 450 acres with trails, picnic areas, swimming pool, playgrounds, and a golf course. The Friday evening picnic will be held in the park within easy walking distance of the dormitories and meeting rooms.

Approximately a quarter million pieces of glass were used in the 23 stained glass windows of the Heinz Memorial Chapel (Fifth Ave. and Bellefield St., 624-4157).

For baseball fans, Forbes Quadrangle (University of Pittsburgh) was built on the site of Forbes Field, former home of the Pittsburgh Pirates. A plaque on the floor inside the building marks home plate and a row of bricks on the street outside marks the left field wall -- immortalized by Bill Mazeroski's 9th-inning homerun that won the 1960 World Series.

There are several small art galleries in the Craig St. area, as well as boutiques and other shops. Vassar-Bryn Mawr alumnae operate a used bookstore down one of the side streets (4612 Winthrop) off of Craig.

The Hunt Institute for Botanical Documentation (5th floor, Hunt Library, Carnegie Mellon Univ.) is currently displaying its International Show of Botanical Art.

A bit out of Oakland in Highland Park is the Pittsburgh Zoo (665-3641), which has recently remodeled and added a Natural Habitat area.

Downtown Pittsburgh & Vicinity

Downtown Pittsburgh (the "Golden Triangle") is situated on a point between the Allegheny River on the north side and the Monongahela River (called simply the "Mon" -- site of the largest inland oil spill) on the south side. These two rivers join at Pittsburgh to form the Ohio River. The downtown area is thus very compact and it's easy to get around on foot. The subway system, however, does make a loop thru town and travel is free in this zone.

Point State Park (281-9284) at the tip of the peninsula is a 36-acre urban state park at the site of a very strategic area in the 18th century. The fountain is fed by yet another, underground, river.

To the south of the point across the Mon and the Ohio is Mt. Washington. The top can be reached via two inclines, which operate until 12:45 am. The Mon Incline is located across from Station Square on Carson St. (round-trip fare $1.20, part of the city transit system) and the Duquesne Incline is less than 0.5 mi away at 1197 W. Carson St. (round-trip fare $1.50, privately operated). The two inclines reach different ends of Grandview Ave, which has observation decks. Parking available near both inclines. This is a highlight of Pittsburgh after dark!

Station Square, at the south end of the Smithfield St. Bridge, occupies the remodeled P & LE railroad station. Pittsburgh's equivalent of Ghiardelli Square, it houses restaurants and shops. Narrated sightseeing cruises on the Gateway Clipper Fleet (355-7980) depart daily from the dock.

To the north of downtown, diagonally across the Ohio River from Point State Park, is Three Rivers Stadium, home of the Steelers and the Pirates (playing the Giants at home, 14-17 July, 321-2827 for ticket information).

Buhl Science Center (321-4300, Allegheny Sq., North Side) offers hands-on exhibits and daily sky shows in the planetarium. Although not contiguous with the rest of the complex, Buhl is part of The Carnegie. Nearby to Buhl are the Pittsburgh Aviary (West Park, 323-7234) and the Pittsburgh Children's Museum (Old Post Office Bldg., Allegheny Center, 322-5058).

Outside Pittsburgh

Old Economy Village in Ambridge (266-1803, 30 minute drive) is a National Register historical site of an early experiment in communal living by the Harmony Society.

Tours of Fallingwater (329-8501, 1.5-2 hr drive), designed by Frank Lloyd Wright, are operated by the Western Pennsylvania Conservancy.

The Youghiogheny River at Ohiopyle (1.5-2 hr drive) is known for whitewater boating. The lower Yough contains class III & IV rapids. Boats for rent as well as guided tours are available. Call Ohiopyle State Park (329-4707) or private concessions (329-8531, 800-5-RAFTIN, 800-WWA-RAFT).

For those familiar with labor union history, a drive along the southside of the Mon through Homestead is interesting. Even if not well-versed on those events, it's still impressive to view the old steel mills along this route, most of which are working at reduced levels or shut down.

RESTAURANTS IN OAKLAND

There are many restaurants within walking distance of the universities and museum, found mostly in a several block area along Forbes Ave.

Fast-foods restaurants include Burger King (on 5th Ave.), McDonalds, Rax, Wendy's (on 5th Ave.), and Roy Rogers. There is also a Roy Rogers on the first floor of the Cathedral of Learning (the tall building).

The Original Hot Dog Shop (fondly referred to as Dirty O's) serves good hot dogs, hoagies, and other sandwiches, delicious fries, and has one of the best selections of beers in Pittsburgh. Not for those who insist on quiet and order.

Primanti Bros. is famous for putting the french fries and cole slaw right on sandwiches. Ask for them on the side if you don't want 'em on top!

Pizza is available both for eat-in and take-out: Pizza Hut (5th Ave.); Domino's (681-1700 for delivery); and others.

C.J. Barney's is a classic college-town hangout -- hamburgers, Mexican food, limited entrees, bar. The more upscale restaurant next to Barney's is Hemingway's, more expensive than others, but in range of $7-15/person.

The Second Plate is located within Forbes Quadrangle and serves soups, salads, and sandwiches cafeteria-style.

There are three restaurants on Atwood (off of Forbes), which are more expensive than most along Forbes, but still moderately priced. Wok Inn (370 Atwood) specializes in Chinese and Vietnamese dishes; Mai Thai (328 Atwood) serves Thai food; and Simply French (344 Atwood) with an a la carte French menu.

Two eateries are found within The Carnegie. The cafeteria (basement level) has sandwiches, a salad bar, and a changing selection of entrees daily. The Museum Cafe (at entrance to Art Museum) has table service and a more expensive selection of sandwiches, quiche, and similar fare.

Across and down Forbes Ave. from the entrance to The Carnegie parking lot is Panther Hollow Inn, which has a full bar and typical bar food. More for the serious drinker than the serious diner.

There are several restaurants along Craig St, directly across from the parking lot entrance to The Carnegie -- most are moderate to expensive. Ali Baba serves Near Eastern food; no liquor license, but you can bring your own (see section on PA liquor laws). Star of India (681-5700) features Indian food (portions rather small) and Great Scot offers an array of sandwiches ($5-$6) plus full dinners ($8-$15); popular with professorial and business types.

Up Craig St. near the corner of Craig and Center, is Oriental Express, which has the best hot and sour soup in Pittsburgh. The bar on the corner, Thirsty's, also serves food.

RESTAURANTS IN NEIGHBORING AREAS

Pittsburgh's neighborhoods offer an array of restaurants. For more information, pick up a copy of Pittsburgh Magazine at the newstand on Forbes Ave. near the dormitories, which lists restaurants by region of the city. All restaurants casual and moderately priced ($5-10/person), except as noted.

Southside

Carson St. on the Southside (south of Monongahela River -- take 5th Ave. to the Birmingham Bridge) houses a number of restaurants. Driving time from Oakland is about 10 minutes; easy parking along Carson St. or in city lot (lot meters in effect 24 hrs/day).

City Grill (2019 E. Carson, 481-6868; 11 am-11 pm) -- hardwood grilled ribs, chicken, burgers, also pasta, full bar.

Mario's and Blue Lou's Bar & Grill (1510 & 1514 E. Carson, 381-5610)-- connecting restaurants offering pasta, barbecued ribs, yards of beer. Good food, but noisy and almost always a wait (sometimes even lines on the sidewalk outside!).

Margaritaville (2200 E. Carson, 431-2200) -- Mexican and California Mexican food; 12 varieties of margaritas. Expensive for Mexican food; OK food, but don't expect to find great Mexican food anywhere in Pittsburgh.

Le Pommier (2104 E. Carson, 431-1901) -- French. The ultimate on Carson St., expensive, reservations required, not casual. Highly rated.

Station Square

If you follow Carson St. a few blocks on toward downtown Pittsburgh, you hit Station Square (discussed in Recreational Activities). Parking available in attended lots.

Houlihan's (232-0302) -- large menu, fern-bar atmosphere, one of the spots mentioned in the Pirates drug scandal, where players made purchases.

Grand Concourse (261-1717) occupies the former train station lobby and waiting rooms -- seafood and other items, expensive and more formal. The adjacent Gandy Dancer Saloon has a raw bar.

Kiku (765-3200) -- Japanese food, sushi bar.

Tequila Junction (261-3265) -- Mexican, see comment under Margaritaville.

Mt. Washington

For directions to Mt. Washington, see Recreational Activities section. The Duquesne Incline is nearer to the restaurants along Grandview Ave. These places -- Christopher's, Le Mont, Cliffside, Tin Angel -- all have lovely views of downtown Pitssburgh, but are expensive. For the experience without spending a fortune, have a drink at Christopher's (1411 Grandview) -- lounge is one floor below the restaurant, but still excellent view, best time sunset or at night. The nearby Georgetowne Inn is cheaper with the same view!

Squirrel Hill

Restaurants mostly along Murray Ave. or Forbes Ave. (which intersect). Street parking can be hard to find, but there are also city parking lots.

Cafe del Sol (2104 Murray, 422-1303) -- voted best ethnic restaurant in 1987 by readers of Pittsburgh Magazine, Guatemalan and other Latin cuisine, bring your own liquor, very small.

Gullifty's (1922 Murray, 521-8222) -- large menu, open late, known for good desserts.

Sir Loin (5841 Forbes, 521-8710) -- roast beef, large salads.

Chinese restaurants include Oriental Balcony (5846 Forbes, 521-0728), Sichuan House (1900 Murray, 422-2700), and the Peking Royal Kitchen (2018 Murray, 421-1920). The last one was rated by readers of Pittsburgh Magazine as the Best Oriental Restaurant and also the Best Inexpensive Restaurant. Remember this is 1988 and the meeting is in Pittsburgh, not Berkeley, so don't have great expectations regarding Oriental cuisine.

Shadyside

Shadyside, formerly a haven for "hippies," has become a yuppie enclave full of trendy restaurants and shops which sell none of the necessities of life. Take 5th Ave. to Aiken, left on Aiken, then right on Walnut; 10-15 minute drive from museum, walking time about 30 minutes; parking on weekend nights very difficult. Restaurants in this part of town are generally more expensive than in Squirrel Hill or South Side.

Szechuan Gourmet (709 Bellefonte, 683-1763) -- one of the best Chinese restaurants in Pittsburgh.

Hotlicks (5520 Walnut, in "The Theatre," 683-2583) specializes in ribs. The Balcony (687-0110) is also in this complex.

Other Shadyside restaurants include Le Petit Cafe (809 Bellefonte--nouvelle cuisine, pricey); Harris Cafe (5747 Ellsworth -- Greek and American food); Gazebo (5442 Walnut -- deli); and Red Bull Inn (401 Shady -- chain restaurant featuring beef and large soup/salad bar).

Pasta Piatto on Bellefonte Street is great! Gourmet Italian, moderate prices.

Night Spots and Dancing -- Official bar closing time is 2 am.

Juliana's of London at The Vista International Hotel (Liberty Center, downtown, 281-3700) -- music videos; happy hour buffet.

Crystal Bar and Lounge (1216 Woods Run Ave, North Side, 766-9255)-- mostly country-western.

Jazz on Liberty (965 Liberty Ave., downtown, 765-2670) -- jazz.

The Penn Cafe (4104 Penn Ave., Bloomfield, 621-9449) -- jazz, blues, folk musicians.

Chauncy's (Station Square, 232-0601) -- "classic hits;" dress code (no jeans, sneakers, or hats).

Graffiti (4615 Baum Blvd., Oakland, 682-4210) -- local and national acts; call for details.

The Balcony (5520 Walnut St., Shadyside, 687-0110) -- live jazz.

Mad Anthony Bier Stube & Restaurant (13th & Merchant Sts., Ambridge, 266-2300) -- Dixieland jazz and more; chef sings and plays requests.

The Decade (223 Atwood St., Oakland) -- the "home of rock 'n roll;" live music on weekends.

Mardi Gras (742 Bellefonte, Shadyside) -- no live music, but one of Pittsburgh's "after hours" places. The doors lock at 2 am, but people inside the place at that time can stay and drink (some until next morning). Patrons start to trickle in about 1:30 am, but if the barman feels uneasy about the crowd, usual closing hours apply.

Pennsylvania Liquor Laws

Wine and hard alcoholic beverages in Pennsylvania for consumption away from the premises of a restaurant can only be purchased at State Liquor Stores. Beer can be purchased either at licensed "beer distributors" (case sales only) or from bars (by the bottle, usually at bar prices, and limited to 2 six-packs). No alcoholic beverages are sold at any other stores. Many restaurants without liquor licenses allow customers to bring their own alcoholic beverages.

A state store is located on Atwood St. about 1/2 block S of Forbes. There is a beer distributor, University Beverage Center at 3606 Forbes Ave. (in the block between Atwood and Meyran). The Original sells individual beers to go at reasonable prices.

Gambling

For gamblers, The Meadows offers harness racing (Meadow Lands exit off I-79, S of Pittsburgh, 225-9300) and the dog track at Wheeling, WV, is about a 40 minute drive. If desperate, try the Pennsylvania lottery.

PARKING INFORMATION (provided by University of Pittsburgh)
(Please refer to page 3 for parking suggestions)

Parking Garages
(on-duty attendant 24 hours a day)

Forbes-Semple Garage
505 Meyran Avenue
621-5922
* entrance on Meyran Avenue, behind Parkvale Saving Building

* $5.75/24 hours
* night rates apply if enter after 4pm and leave before 6am Mon-Fri, or after 4pm Fri and before 6am Mon.

less than..
1/2 hr. $1.25 — 4 hr. $4.00
1 hr. $2.25 — 5 hr. $4.50
2 hr. $2.75 — 6 hr. $5.00
3 hr. $3.25 — 7 hr. $5.25
7hr.-24hr. $5.75

night rates
1 hr. $0.75 — 3 hr. $1.25
2 hr. $1.00 — over 3 hr. $1.50

Medical Arts Garage
115 Atwood Street
682-6400
* entrance across from Baskin-Robbins on Atwood St. (one-way traffic from Forbes to Fifth)

* $5.50/24 hours

less than..
1/2 hr. $1.00 — 6 hr. $4.25
1 hr. $2.00 — 8 hr. $4.75
2 hr. $2.75 — 10 hr. $5.00
4 hr. $3.50 — 24 hr. $5.50

University Health Center Garage
201 Lothrop Street
683-9434
* located in the Victoria Building

* $5.75/24 hours

less than..
1 hr. $2.25 — 5 hr. $4.50
2 hr. $2.75 — 6 hr. $5.00
3 hr. $3.25 — 7 hr. 5.25
4 hr. $4.00 — 8hr.-24hr. $5.75

Parking Lots

Scaife Hall Unit
Fifth Avenue and Lothrop Street
682-5757
* open lot with entrance on Lothrop St.
* attendant on-duty form 7am-9pm

1st hr. $2.50 — 9pm-7am no charge
each additional hour $0.50
7 hr. -close — $5.50

Carnegie Library/Hillman Library Lot
* located off Bigelow Blv. between Forbes Ave. and Roberto Clemente Dr.
* meters @ rate of $0.25/ 1/2hr.

TRANSPORTATION GUIDE (Information from University of Pittsburgh)
(please see page 1)

BUS SERVICE

Continental Trailways	261-5400
Greyhound	391-2300

* bus terminals are located in downtown Pittsburgh

LIMOUSINE SERVICE: AIRLINE TRANSPORTATION CO. one-way fare = $8.50
471-8900 call for holiday information
471-2250

Monday - Friday

Webster Hall		University Inn	
to airport	from airport	to airport	from airport
6:50 AM	9:00 AM	7:00 AM	9:00 AM
7:50 AM	10:00 AM	8:00 AM	10:00 AM
8:50 AM	11:00 AM	9:00 AM	11:00 AM
9:50 AM	12:00 NOON	10:00 AM	12:00 NOON
10:50 AM	1:00 PM	11:00 AM	1:00 PM
11:50 AM	2:00 PM	12:00 NOON	2:00 PM
12:50 PM	3:00 PM	1:00 PM	3:00 PM
1:50 PM	4:00 PM	2:00 PM	4:00 PM
2:50 PM	5:00 PM	3:00 PM	5:00 PM
3:50 PM	6:00 PM	4:00 PM	6:00 PM
4:50 PM	7:00 PM	5:00 PM	7:00 PM
5:50 PM	8:00 PM	6:00 PM	8:00 PM
6:50 PM	9:00 PM	7:00 PM	9:00 PM
7:50 PM			

Saturday

William Penn Hotel
to airport

from 5:30 AM - 7:00 PM leaves every 30 minutes
from 7:00 PM - 10:00 PM leaves every 60 minutes

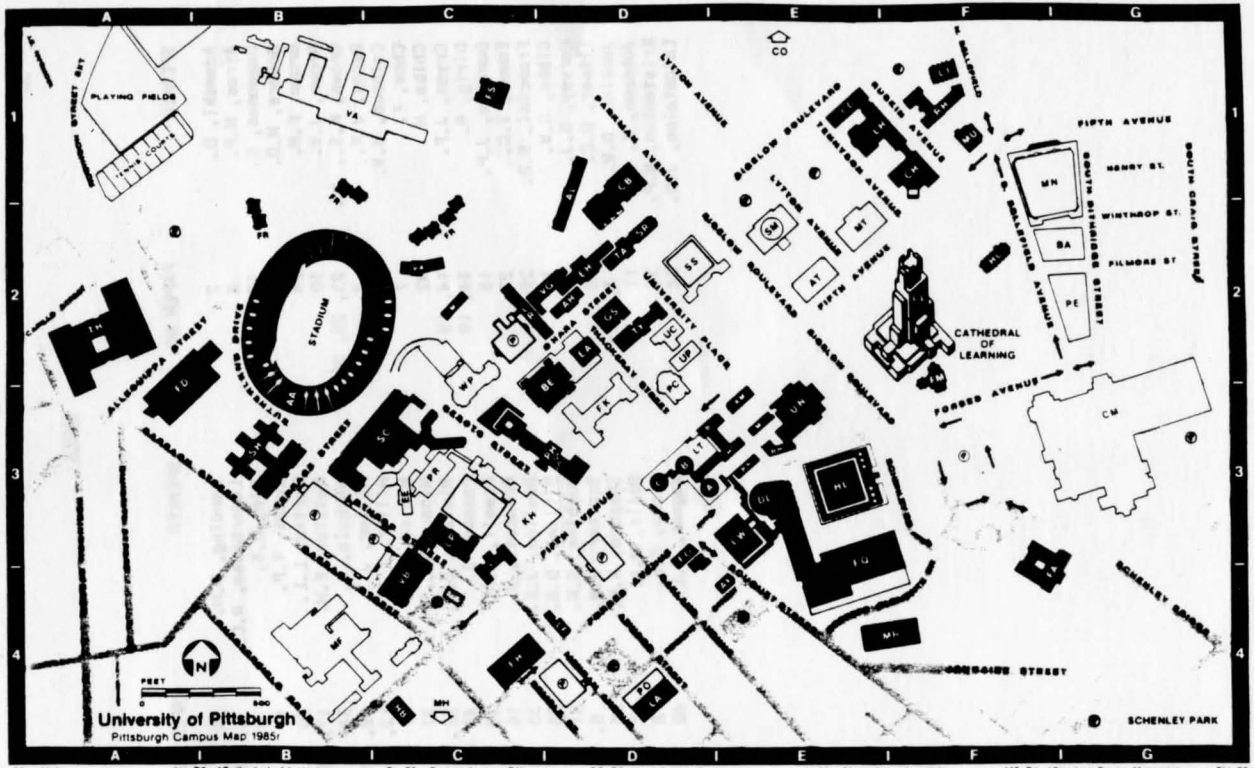
Sunday

Webster Hall		University Inn	
to airport	from airport	to airport	from airport
1:50 PM	2:00 PM	2:00 PM	2:00 PM
2:50 PM	3:00 PM	3:00 PM	3:00 PM
3:50 PM	4:00 PM	4:00 PM	4:00 PM
4:50 PM	5:00 PM	5:00 PM	5:00 PM
5:50 PM	6:00 PM	6:00 PM	6:00 PM
6:50 PM	7:00 PM	7:00 PM	7:00 PM
7:50 PM	8:00 PM	8:00 PM	8:00 PM
	9:00 PM		9:00 PM

TAXI SERVICE

Colonial Taxi	883-3300
Peoples Cab	681-3131
Yellow Cab	665-8100

* average fare from the Pittsburgh International Airport to the University of Pittsburgh is about $30.00. Ride sharing is recommended.



A		B		C		D		E		F		G	
Allen Hall	AH D2	*Cathedral of Learning	CL F2	Forbes Avenue Offices	FO D3	*Law School Building	LW E3	Montefiore Hospital	MF B4	*Stephen Foster Memorial	FM F2
*Alumni Hall (Chem. Comp. Sci.)	AL D1	Catholic Oratory (off map)	CO E1	*Forbes Quadrangle	FQ E3	Lawrence Hall (see David)		*Music Building	MU F1	Syria Mosque	SM E2
Amos Hall (dorm)	AM E3	Chemistry Building	CB D1	(Economics, GSPIA)		Learn. Res. & Dev. Ctr. (LRDC)	LR C2	*Parran Hall (Public Health)	PH D3	*Thackeray Hall	TY D2
Annex (City Theater)	AX E4	Children's Hospital	KH C3	Forbes Residence Hall	FH C4	Library Annex	LA D4	Pennsylvania Hall	PA C2	(Mathematics Registrar)	
Athletic Administration offices	AA B3	City Theater (see Annex)		Fraternity Housing Complex	FR B2	*Library & Info. Sci. Bldg. (LIS)	LI F1	(Health Related Professions)		Thaw Hall	TA D2
Bellefield Annex	BA G2	Clapp Hall	CH F1		FR C2	Litchfield Towers (dorms A,B,C)	LT D3	Pittsburgh Athletic Assoc.	AT E2	Towers (see Litchfield)	
(originally Y.M.&W.H.A.)		Crabtree Hall (Public Health)	PH C3	*Frick Fine Arts	FA F4	Loeffler Building	LF D4	Pittsburgh Board of Ed.	PE G2	Trees Hall (athletic facilities)	TH A2
Bellefield Presbyterian Church	PC D3	Crawford Hall	CD E1	Frick School	FK D3	Lothrop Hall (dorm)	LP C3	Post Office (Oakland Branch)	PO D4	University Club	UC D2
*Michael L. Benedum Hall		(David) Lawrence Hall	DL E3	Gardner Steel Conf. Center	GS D2	Magee-Womens Hospital	MH C4	Presbyterian-Univ. Hospital	PR C3	University Place Office Bldg.	UP D2
of Engineering	BE D3	Engineering Auditorium	EA D2	(Alumni Affairs, Faculty Club)		(off map)		Public Health (see Crabtree or Parran)		Van de Graaff Building	VG D2
Book Center	BC D3	*(Old) Engineer Hall (Physics)	EH D2	Heinz Memorial Chapel	HC F2	Masonic Temple	MT E2	Ruskin Hall	RH F1	Veterans Hospital	VA B1
Brackenridge Hall (dorm)	BR E3	Eye and Ear Hospital	EE C3	Hill Building, 3434 Fifth Ave.	HB C4	McCormick Hall (dorm)	MC E3	Salk Hall (Dental School)	SH B3	*Victoria Bldg. (Nursing School)	VB C4
Bruce Hall	BH E3	Falk Clinic	FL C3	*Hillman Library	HL E3	Mellon Institute	MN F1	*Scaife Hall (Health Sciences)	SC C3	Western Psych. Inst. & Clinic	WP C2
(Admissions, Student Aid, dorm)		Falk School	FS C1	Holland Hall (dorm)	HD E3	*Mervis Hall (Business School)	MR E4	Soldiers & Sailors Memorial	SS D2	William Pitt Union	UN E3
Carnegie Museum	CM G3	Fitzgerald Field House	FD A3	*Langley Hall (Biology, Psych.)	LH E1	Mineral Industries Building	MI C2	Space Research Coord. Center	SR D2	(*denotes library in building)	

INDEX

COMMITTEE FOR HOSTING THE 39TH ANNUAL MEETING

Coordinator - J.E. Rawlins

Program. Planning - J. Rawlins
Production - J. Loughlin

Preregistration - J. Rawlins, M.A. Schmidt
Registration - C. Young, A. Edwards
Projection - R. Davidson
Collection - W. Zanol

Accommodations and Information
S. Thompson, P. Roble
Carnegie Mellon Dining Service
M.L. Noonan, J. Mitchell
University of Pittsburgh Student Housing

Meeting Logo - M. Klingler

Field Trips.
Ohio: J. Leland, E. Metzler
Pennsylvania: J. Merritt, C. Young, W. Zanol
West Virginia: R. Acciavatti, R. Davidson

Sponsor: The Carnegie Museum of Natural History