

Pacific Division
American Association for the Advancement of Science
NEWSLETTER

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January 10, 2003

**84th ANNUAL MEETING OF THE PACIFIC DIVISION AT
SAN FRANCISCO STATE UNIVERSITY AND THE
CALIFORNIA ACADEMY OF SCIENCES
June 15–19, 2003**



California Academy of Sciences
(Photo courtesy Roger Christianson)

**2003 ANNUAL MEETING OF THE
AAAS PACIFIC DIVISION**

The AAAS Pacific Division and its affiliated societies and sections will hold their 84th annual meeting on the campus of San Francisco State University and also at the California Academy of Sciences, helping to commemorate the 150th anniversary of the Academy. Due to the unique nature of this meeting, the Division's Program and Special Events Committee is making a special effort to design a program of exceptional scientific merit, especially as it relates to the activities of natural history museums, and, in particular, the California Academy of Sciences.

All scientists and graduate and undergraduate students are invited to present research papers of their research results either orally or as posters. All registrants for the meeting may attend the scientific sessions as well as participate in the many

other activities. Some activities, notably field trips and selected workshops, require advance registration and payment of additional fees. Dr. Nina Jablonski, Department of Anthropology, California Academy of Sciences, and Dr. Alan Levinton, Department of Herpetology, California Academy of Sciences, are co-chairs of this year's annual meeting.

This *Newsletter* contains a preliminary description of the scientific program, a call for papers, directions for preparation of abstracts, and information about preregistration, housing, transportation, special events, and field trips.

The following societies and sections will sponsor sessions

Please visit the Pacific Division website for the latest news about Division activities and updated meetings information. E-mail should be addressed to aaaspd@sou.edu.

<http://pacific.aaas.org>

at the meetings. The names and addresses of session chairs are listed beginning on page 16.

- Western Society of Soil Science**
- Agriculture and Horticultural Sciences Section**
- Anthropology and Archaeology Section**
- Atmospheric and Oceanographic Sciences Section**
- Biological Sciences Section**
- Chemistry Section**
- Computer and Information Sciences Section**
- Earth Sciences Section**
- Ecology and Environmental Sciences Section**
- Education Section**
- Engineering and Industrial Sciences Section**
- Health Sciences Section**
- History and Philosophy of Science Section**
- Psychology Section**
- Social, Economic and Political Sciences Section**

UNITED AIRLINES SPECIAL OFFER

Save up to 15% on airfare for travel on United to San Francisco between June 11–22, 2003.
 You or your travel agent call UAL's Specialized Meeting Reservation Center at **1-800-521-4041**
 8:00 am to 10:00 pm Eastern Time
 Refer to meeting ID Number **516BD**.
 Call at least 30 days in advance for best discount.

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**SAN FRANCISCO STATE UNIVERSITY
 AND SAN FRANCISCO**

The forerunner of San Francisco State University, the California State Normal School, was founded in 1862 in San Francisco. Two subsequent name changes and three changes of location within the city brought the institution to its present 130-acre campus in southwest San Francisco in 1954. It received University status in 1972.

San Francisco State University is part of the 21-campus California State University—the largest system of public higher education in the world—and is a multipurpose coeducational institution with more than 24,000 students and 1600 faculty members. More than 75 percent of the students come from within the State of California, three-fourths of whom are from the San Francisco Bay Area, and 13 percent from other counties. Through its eight schools, Behavioral and Social Sciences, Business, Creative Arts, Education, Ethnic Studies, Health and Physical Education, Humanities, and Science, the University offers undergraduate and graduate instruction for professional and occupational goals as well as liberal arts education. Bachelor's degrees are offered in 89 academic areas, master's degrees in 73 areas, and doctorate degrees in special education, the latter in cooperation with the University of California, Berkeley.

The focal point of the campus is the Student Union. With its two dramatic leaning pyramids, it is a campus landmark. The Union houses a number of restaurants, a pub-coffee shop, meeting rooms, and a game center. The major academic buildings cluster around the Union, on the edges of a grassy quadrangle. The Creative Arts complex is the largest facility of its kind in San Francisco. It contains four theaters, a concert hall, music and drama rehearsal areas, and one of the largest television and radio production facilities in northern California. The Science complex features a modern planetarium, marine biology research facilities, herbarium, vertebrate museum, bioacoustic laboratory, greenhouses, extensively equipped physics and chemistry laboratories, and computer science facilities.

The University Library houses more than 2-1/2 million titles and subscribes to more than 4000 periodicals and scholarly journals. It also houses the Frank V. de Bellis Collection of Italian culture. The Sutro Library, with its special collections of historical materials, is situated in a modern building on the north edge of campus.

In addition to the Romberg and Tiburon Centers, the University has two other off-campus field centers for special study; Moss Landing Marine Laboratory, on Monterey Bay, 100 miles south of San Francisco, and the Sierra Nevada Field Campus in the foothills of the Sierra Nevada. The San Francisco State University downtown center, located in the heart of the city, offers classes for personal and professional development, as well as meeting and conference facilities.

CALIFORNIA ACADEMY OF SCIENCES

Founded in 1853 to survey and study the vast resources of California and beyond, the California Academy of Sciences is the oldest scientific institution in the West. Originally named the California Academy of Natural Sciences (until 1868 when the present name was adopted), the Academy consisted of a group of naturalists who, spurred by their concern over the natural environment during the California gold rush, met weekly in an office on Clay Street. Through this forum, scientific papers were presented on topics of interest to a growing membership of San Francisco citizens. As the collection of specimens from the field grew in number and scope, the important scientific work of systematics began.

As the collections increased, the Academy needed to find a place to house and display them. After two or three temporary locations, James Lick bequeathed a six-story building on Market Street between 4th and 5th streets. For 15 years visitors streamed in to see the displays of mammals, birds, plants, skeletons, insects and natural "curiosities" such as the extinct Dodo and woolly mammoth.

The earthquake and fire of 1906 left the museum building in charred ruins and destroyed virtually all of its holdings. But even as the city burned, a two-year Academy expedition to the Galapagos Islands was gathering the material that would form the nucleus of the institution's new collections.

The citizens of San Francisco, through a ballot measure, agreed that the Academy of Sciences should

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San Francisco State University is a multipurpose institution of higher education located in a large, diverse urban setting. Excellence in teaching is the University's primary mission and distinguishing feature, although commitments to research and service to the community are high priorities.

The University enjoys the advantage of being in one of the most exciting and cosmopolitan cities in the world. It is just minutes away from the San Francisco Zoo, Ocean Beach and Cliff House, Golden Gate Park, California Academy of Sciences and Steinhart Aquarium, De Young Museum of Fine Arts, Strybing Arboretum, Japanese Tea Garden, Exploratorium, and many other nearby museums. It is also less than 20 minutes away from downtown San Francisco, with its numerous fine shops, Fisherman's Wharf, Telegraph Hill (and its spectacular view of the Bay and the Golden Gate Bridge), and numerous other points of interest.

The San Francisco climate during June should be mild, with temperatures not much above 73°F (23°C) or below 50°F (10°C). Fog is always a possibility and participants should be prepared for cool as well as warm weather.

REGISTRATION

All persons planning to attend the meeting should preregister using the form on page 27. Advance registration fees are \$60 for professionals, \$40 for retirees, and \$30 for students and spouses of registrants. K-12 and community college teachers are encouraged to attend the meeting for a reduced professional registration fee of \$40. Advance one-day preregistration is \$40. After May 23 higher registration fees will be charged: professional, \$80; K-12, community college teachers and retirees, \$55; and students and participating spouses, \$45. One-day registration is available on-site for \$55. If you attend more than one day, you must pay the full registration fee.

About field trips: Preregistration for all field trips is required because of limited seating in the vans and the need to inform some destinations of numbers of people arriving. If you are interested in one or more of the excursions, it is recommended that you register early.

At least one member of a family group requesting field trip reservations must be a paid meeting registrant.

Please send your Advance Registration form and accompanying payment to **AAASPD Meetings, Department of Biology, Southern Oregon University, Ashland, OR 97520.**

ACCOMMODATIONS AND FOOD SERVICE

Residence Halls: San Francisco State University is offering an especially attractive rate for housing and food service. For those who choose to stay four nights, June 15–18, the cost is \$175 per person, double occupancy, and \$267

Hawaiian hula dancers during the traditional Hawaiian welcome at the Pacific Division 2002 Annual Meeting.

DIVISION ACTIVITIES AND STUDENT AWARDS AT THE WAIMEA, HAWAII MEETINGS

In June, 2002, the Pacific Division held its 83rd annual meeting at the Hawaii Preparatory Academy in Waimea, Hawaii. Successful beyond any of our expectations, 250 paid registrants enjoyed 13 half-day symposia, one poster session and six field trips on the Big Island of Hawaii.

The meeting opened on Wednesday evening with a traditional Hawaiian welcome, co-sponsored by the Kohala Center in Waimea. Traditional Hawaiian hula dancers (not to be confused with the more common Polynesian hula) reenacted the discovery of the Hawaiian Islands through drum music and dance (see photo above). Following a welcome by Hawaii mayor Harry Kim and a traditional Pule (prayer), the program moved inside to a sumptuous dinner buffet featuring Hawaiian, Tahitian and Japanese foods. Other social events that combined the beauty of Hawaii with the excellent cuisine were a barbecue at Hapuna Beach on Thursday evening and a traditional Hawaiian luau on Saturday evening.

The technical program began Thursday morning with a plenary lecture series open to the public, centering on science on the Big Island of Hawaii. Presenters included Donald Swanson (United States Geological Survey, Hawaiian Volcano Observatory), "Growth and Destruction of the Island of Hawaii;" Dr. Alexander

View of Hapuna Beach.

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per person, single occupancy. This includes 10 meals; dinner Sunday, breakfast, lunch and dinner Monday, breakfast and lunch Tuesday, breakfast, lunch and dinner Wednesday, and breakfast Thursday. Tuesday evening is reserved for the Division Dinner at the California Academy. The \$25 cost for this must be paid separately (see Advance Registration form). For those wishing to stay for five nights, June 15 -19, the cost is \$213 per person, double occupancy, and \$328 per person, single occupancy. This five-night package includes all of the meals in the four-night package with the addition of dinner on Thursday and breakfast on Friday.

The rooms are clean and two persons to a room (except for singles), but they are dormitory style with shared bathroom facilities on each floor. Each guest will receive a blanket, pillow, mattress pad, bed linen (two sheets and a pillow case), two bath towels, soap and a cup. You are expected to make your own bed. A linen exchange is provided (ask for location at Dorm Registration Desk) for towels to be replaced every third day. Daily maid service is not provided. Check-in time is 3 pm on Sunday and check-out by 11 am on Thursday or Friday, depending on your housing package. **No smoking is allowed in the facilities, including the bedrooms.**

Residence Hall Check-in: Room assignments may be picked up at the front desk of Mary Ward Hall. The desk is staffed 24 hours a day. Should you need to contact the residence hall staff, call 415-406-5703. Advance payment, in full, is required. **Loss of room key or meal card is subject to a \$50 fee.**

Early Arrivals, Late Departures: The University has made available a block of rooms for early arrivals (nights of Friday, June 13, and/or Saturday, June 14) and late departures (nights of Friday, June 20, and/or Saturday, June 21). The cost for these rooms is \$23 per person per night, double, and \$46 per person per night, single, plus food and other fees. In order to reserve a room for early arrival and/or late departure, contact Dania Russell, Assistant Director of Conference and Residential Services at SFSU, by e-mail: dhowell@sfsu.edu, phone 415-338-7135, or by fax: 415-405-0393 with your request. You must make these arrangements directly with SFSU no later than May 15, 2003.

On-Campus Dining: For those staying on-campus, dining facilities are located at the City Eats dining facility, which is close to Mary Ward Hall. The cafeteria-style service presents a large variety of individual choices. *Ala carte* service is available in the Cesar Chavez Student Center.

There are many restaurants in San Francisco and its environs. In the Stonestown Galleria (Mall), located adjacent to the University, there are at least a dozen dining establishments, ranging from fast-food to full-service.

Housing reservation forms and payment to "AAAS, Pacific Division" should be sent to: AAAS, Pacific Division, Department of Biology, Southern Oregon University, Ashland, OR 97520. (DO NOT SEND YOUR MAIN HOUSING REQUEST TO THE UNIVERSITY). Please

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rebuild in Golden Gate Park, across the Music Concourse from the M.H. DeYoung Museum and Japanese Tea Garden. In 1916 the first building was opened, the North American Hall of Birds and Mammals, which was renovated in 1988 as Wild California. In chronological order the next buildings were the Steinhart Aquarium (1923), Simson African Hall (1934), Morrison Planetarium (1952), Cowell Hall (1969), Wattis Hall (1976), the Fish Roundabout (1977), and Life Through Time (1990).

As the public museum grew, so did the research collections, which are considered national treasures, veritable lending libraries of specimens from the natural world that are available for scientific study. The Academy has eight scientific research departments in the fields of anthropology, aquatic biology, botany, entomology, herpetology, ichthyology, invertebrate zoology and geology, and ornithology and mammalogy.

Today, as one of the 10 largest natural history museums in the world, the Academy brings the message of research to nearly one and a half million visitors each year. Like its sister institutions, the Smithsonian Institution, the American Museum of Natural History in New York and the Field Museum in Chicago, the California Academy of Sciences is devoted to the study, display and interpretation of scientific collections which inspire people of all ages to explore the rich variety of life on Earth.

Editor's note: The above information was excerpted and modified from the California Academy of Sciences website, <http://www.calacademy.org/geninfo/mission.html>.



indicate on your Housing Reservation Form if you have a physical disability that requires special arrangements, such as ground floor accommodations, wheelchair access to buildings, transportation around campus, or a handicapped parking permit.

Local off-campus accommodations. There are many hotels and motels in the San Francisco area, though few are near the university and none within walking distance. Nearby options include:

•**Days Inn***

2600 Sloat Boulevard, SF 94116
415-665-9000

•**Beach Motel**

4211 Judah @ 47th Ave., SF 94118
415-681-6618

•**Great Highway Motor Inn**

1234 Great Highway, SF 94122
415-731-6644

•**Ocean Park Hotel**

2690 46th Ave., SF 94116
415-566-7020

•**Roberts At-the-Beach**

2828 Sloat Blvd., SF 94116
415-564-2610

•**Seal Rock Inn***

545 Point Lobos Ave., SF 94121
415-752-8000

*wheelchair accessible

Recreational Vehicle Facilities: One site in the area offers full RV hookups:

•**Pacific Park RV Resort**

700 Palmetto Avenue, Pacifica 94044
650-355-7093

Please make your reservations for off-campus housing directly with the hotel/motel of your choice. Note that AAAS, Pacific Division, presents the above hotels, motels and resorts for information only, not as an endorsement for any specific commercial enterprise.

TRANSPORTATION AND CAMPUS PARKING

San Francisco is served by all major airlines and many commuter airlines through San Francisco and Oakland International Airports, by Amtrak (through Oakland), by Greyhound Bus Line or by automobile via U.S. 101 and Interstate Highway 280 from the south. Mary Ward Hall is located at 800 Font Boulevard.

By Car. From the North: Take Highway 101 South and cross the Golden Gate Bridge. Take 19th Avenue/Highway 1 exit. Follow 19th Avenue to campus at Holloway Avenue.

From the South: Take I-280 North, exit at 19th Avenue. Take Junipero Serra Boulevard to Holloway Avenue, turn left on Holloway Avenue to campus at 19th Avenue.

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Participants on the Dry Forest Reforestation field trip enjoying the view from 11,000 feet up on Mauna Kea. Look closely and you can see cinder cones on the valley floor.

Malahoff (Department of Oceanography, University of Hawai'i at Manoa), "Contemporary Submarine Volcanic Processes: Loihi Submarine Volcano, Hawai'i;" and Jean-Charles Cuillandre (Canada France Hawaiian Telescope), "The Hawaiian Starlight: Stargazing from Mauna Kea." Additional public sessions included a noon talk by Dr. Don Hemmes (Biology Department, University of Hawai'i, Hilo) and the symposium "Vog-Volcanic Fog," organized by Dr. William Berry (Department of Earth and Planetary Sciences, University of California, Berkeley).

All of the technical sessions were well-attended and much appreciated by attendees. Of particular note were the symposia, "Island Biogeography, with a Pacific Flavor" and "Peopling of the Pacific," both organized by Dr. Nina Jablonski (Department of Anthropology, California Academy of Sciences). Other excellent symposia included "e-Learning in Science: Wide Range of Activities K-16," organized by Dr. Kathleen Fisher (Center for Research in Mathematics and Science Education, San Diego State University); "Recent Advances in Volcanology in Hawai'i," organized by Donald Swanson (United States Geological Survey, Hawaiian Volcano Observatory); "Atmospheric Carbon Dioxide: Its Measurement and Remediation," organized by Dr. Roger Christianson, (Department of Biology, Southern Oregon University); "Conservation of Nature and Knowledge about Nature in Hawai'i," organized by Sam Gon (The Nature Conservancy of Hawai'i); and "Vog— Volcanic Fog," organized by Dr. William Berry (Department of Earth and Planetary Sciences, University of California, Berkeley).

Most of the field trips occurred on Friday, between the two days of technical sessions on Thursday and Saturday. They offered participants a tremendous range

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From the East: Take I-80 West across the Bay Bridge to Highway 101 South. Take 101 South to I-280 toward Daly City. Take the Mission St./Daly City exit, bearing right onto Sagamore Street to Brotherhood Way to Junipero Serra Boulevard North. Take Junipero Serra Boulevard to Holloway Avenue, turn left on Holloway Avenue to campus at 19th Avenue. To get directly to the parking garage, stay on Brotherhood Way and turn right onto Lake Merced Blvd. Then turn right at the second stoplight (State Drive), which takes you to the entrance to the public parking garage.

By BART. Take any San Francisco-bound BART train to the Daly City BART station. MUNI and SamTrans have bus service from the Daly City BART station. MUNI's 28 line and SamTrans' 3B line serve the campus 7 days a week. Obtain a transfer (good for one ride to and from BART) from the machine in the lobby before exiting the station. Exit at the 19th Ave. and Holloway Ave. stop.

By MUNI. From downtown San Francisco, take the MUNI Metro **M**–Oceanview streetcar.

The campus is also served by the following MUNI bus lines:

M–Oceanview- streetcar to downtown and Balboa Park Station.

17–Park Merced to West Portal Station.

18–46th Avenue/Zoo, Sunset and Richmond Districts, Palace of the Legion of Honor.

26–Valencia to Ocean View, Balboa Park BART station, Glen Park Station, Mission District to 5th and Mission.

28–19th Avenue to Daly City BART station, Sunset and Richmond Districts, Golden Gate Bridge, Fort Mason. (28L-limited service Monday-Friday only).

29–Sunset to Ingleside, Excelsior, Bayview districts and Candlestick Park.

Parking is limited to approximately 2,500 spaces in the General Parking Garage at the west side of campus (Lot 20). Entry is from Lake Merced Boulevard, with a \$5/day fee. Access to all other parking areas closer to the central campus is by permit only. Parking is enforced 24 hours a day, seven days a week. After 5 pm Friday through 7 am Monday, all valid daily permits are valid in any SFSU parking lot. Handicap spaces require a valid SFSU permit **in addition** to a valid handicap placard or handicap/disabled plate. There is a 20 minute time limit while parked in a yellow zone. Parking is not allowed in a red zone. Unrestricted street parking is available along 19th Avenue and Junipero Serra Boulevard on the east side of the campus. The adjacent Stonestown shopping area, to the north of campus, provides short-term parking for customers.

Assistance with local transportation schedules and information will be available at the Registration Center and at the Student Union Information desk.

REGISTRATION CENTER

The Registration Center will be set up in Creative Arts 224, which is adjacent to McKenna Auditorium (see campus map, p. 31). It will be open at 2 pm on Sunday, 8 am on Monday through Thursday, and remain open daily until 5 pm except Thursday, when it will close at 2 pm.

MEETING ROOMS

This year's technical sessions will meet in various rooms in the Creative Arts building at San Francisco State University. Meeting rooms will be equipped with a 35mm slide projector and an overhead projector. Speakers requiring other specialized equipment must make their requests on the e-mail abstract submission form. Specialized equipment, such as VHS/TV, will be provided if available. Computers and computer-projection equipment rental incur additional costs, which are the responsibility of the speaker, and subject to equipment availability. A Speaker's Preview Room, with projection equipment, will be open during the meeting. The meeting rooms and presentation time schedule will be published in the "Program with Abstracts" issue of the *Proceedings* (vol. 22, part 1), which will be available to those who have registered for the meetings. Speakers will receive final confirmation of the time and place of their presentation via e-mail at least two weeks prior to the meeting.

POSTER SESSIONS

Posters will be assigned a display space of 40" X 60" (1 m X 1.5 m). If you need more space, please contact the Division office by e-mail: aaaspd@sou.edu or telephone: 541-552-6869 to discuss your needs *no later than May 12, 2003*. Posters will be grouped by discipline and subject matter. Each presenter will be given at least two hours for poster display although more time may be available. Presenters should set up their posters no less than 15 minutes before the beginning of their presentation session and are expected to be available to discuss their work during the time their poster is on display (generally a 3-hour period in the morning or afternoon). Posters should be removed within 15 minutes of the close of the session. Student posters will be judged for awards of excellence. Students must be present during the judging of posters.

With the permission of Dr. Carol Waite Conner and the Geological Society of America, the Pacific Division has reprinted Dr. Conner's article, "The Poster Session: A Guide for Preparation." It can be found on the Division's website (pacific.aas.org; from the meetings menu click on "Poster Preparation," listed in the left-hand column).

SPECIAL EVENTS

Sunday Evening Illustrated Lecture. Dr. Thomas Daniel (Botany Department, California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118) will present the Sunday evening lecture, "Botanical Heroes and the Flora of San Francisco." It is scheduled for 7:30 pm in the Coit Lounge, Seven Hills Center (see map on p. 31).

Sunday Evening Welcome Wagon and Cracker Barrel Mixer, hosted by the Pacific Division and its affiliated societies and sections. All registrants and their families are invited to enjoy the conviviality of this social on June 15 from 8:00 to 10:00 pm in the Nob Hill Room, Seven Hills Center (see map on p. 31). A selection of beer, soft drinks, chips and pretzels, and good conversation will be available.

Monday Noon Lecture. The Monday noon lecture will feature Dr. Fred C.C. Peng (Neurological Institute, Department of Neurosurgery, Veterans General Hospital-Taipai, Taipei, Taiwan 11217) speaking on "Memory and Cognition: What are They?" This lecture is currently scheduled for 12:15 pm in the Nob Hill Room, Seven Hills Center (see map on p. 31).

Monday Evening Presidential Lecture. Dr. John J. Carroll (Atmospheric Sciences Section, Department of Air, Land and Water Resources, University of California, Davis, CA 95616), President of the Pacific Division, will give the annual Presidential Lecture, starting at 7:00 pm in the Nob Hill Room, Seven Hills Center (see map on p. 31).

Monday Evening President's Reception. San Francisco State University President Dr. Robert A. Corrigan will welcome conferees at an informal hosted reception in the Seven Hills Center (see map on p. 31), 8:15 to 10:00 pm. All participants and their families are invited to enjoy this relaxed occasion. Nonregistered family members are welcome, but must be accompanied by a registrant. Please wear your registration badge.

Tuesday Afternoon Visit to the California Academy of Sciences. Starting at 4:00 pm, paid registrants and family members will be admitted to the California Academy of Sciences at no charge (see map on p. 31 for driving instructions to the Academy from SFSU). Plan on enjoying the displays of the Academy in advance of listening to the series of mini-talks on the past, present and future of the Academy, as well as the Reception and Division Dinner later that evening.

Tuesday Evening Talks on the History and Future of the California Academy of Sciences. Starting at 6:00 pm in the Morrison Auditorium, California Academy of Sciences, there will be a

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of activities, from observing rainforests and cold water mariculture research projects to learning about dry forest reforestation projects, viewing the very rare and endangered silverswords in their protective enclosure at the 11,500 foot level on Mauna Kea, and getting to within a few feet of active lava flows from Kiluea, the active volcano on the south end of the island.

Silversword in bloom at the 11,500 foot level on Mauna Kea.

Saturday evening Dr. Nina Jablonski (Department of Anthropology, California Academy of Sciences), Pacific Division President for 2001/2002, gave her very interesting Presidential Address, "The Evolution of Human Skin Coloration" (see page 18 for a transcript of her address). Following was the Division Dinner, a traditional Hawaiian luau, complete with roast pig and a large variety of other delicacies.

Drs. Nina Jablonski and William Berry served as long distance co-chairs of the organizing committee. They did a marvelous job, as attested by all attendees.

STUDENT AWARDS

Each year the Division's affiliated societies and sections conduct student competitions for best papers. Waimea was no exception. About 25 papers were given by students, and the Division's Awards Committee had difficulty at times deciding between very good presentations. The following awards were announced:

AAASPD Geraldine K. Lindsay Award for Excellence in the Natural Sciences: Darla J. White (Marine Science Department, University of Hawai'i at Hilo), "Ciguatera in Hawai'i: Distribution of Toxigenic Dinoflagellates, Ciguateric Fish and Related Abiotic and Biotic Factors."

Section and Division student award winners. From left to right, Tom Dutro (Awards Committee Chair), Riley Arthur, Leona Flores, Brooke Stuercke, April Agee, Darla White, and Sara McCutcheon.

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series of short talks on the history and future of the California Academy of Sciences. Speakers tentatively are *Dr. Alan E. Leviton* (Department of Herpetology, California Academy of Sciences), *Dr. Peter H. Raven* (Director, Missouri Botanical Garden) and *Dr. Patrick Kociolek* (Director, California Academy of Sciences).

Diorama in African Hall at the California Academy of Sciences.

Tuesday Evening Announcement of the Winners of the Student Awards for Excellence. Starting immediately after the talks about the California Academy, and also in the Morrison Auditorium, affiliated societies and sections will announce the student awards for excellence. The Division will also announce the names of the students selected to receive the Division's Laurence M. Klauber Award for Excellence (unrestricted), Geraldine K. Lindsay Award for Excellence in the Natural Sciences, J. Thomas Dutro, Jr. Award for Excellence in the Geosciences, Rita W. Peterson Award for Excellence in Science Teaching, the President's Award for Excellence (unrestricted), the Best Poster Award (for poster presentations only but otherwise unrestricted), and the Robert I. Larus Travel Award, which provides for travel and other expenses for the awardee to attend the 2004 annual meeting of AAAS in Seattle, WA, February 12-17.

The Klauber, Lindsay, Dutro, Presidents', Best Poster, Peterson, and Larus awards are given to those students whose presentations are judged the most significant in the advancement or understanding of science. Eligible students must: (1) register for the meeting, (2) present the paper or poster, and (3) be the principal research investigator. Student presentations, oral and poster, are judged on their abstracts, content, style of delivery or presentation, and audiovisual aids and/or handouts (if used). The evaluation forms (oral and poster) are posted on the Division's website. Students who register for the meetings and present papers will be the Division's guests at the Division Dinner.

Tuesday Evening Reception and Dinner. The no-host Divisional Dinner will be held Tuesday evening beginning at 8:00 pm in the African Hall at the California Academy. The cost is \$25 per person and you must sign up in advance (please see Advance Registration Form, p. 27). Students who

are paid registrants and have presented a paper or poster are guests of the Division. Students should pick up their complementary ticket at the Registration Center by noon on Tuesday, June 17. Dinner will be preceded by a no-host cocktail reception in the 150th Anniversary Exhibit. Wine, beer and a variety of soft drinks will be available, starting about 7:30 pm. All are invited and encouraged to attend these annual events.

Business Meeting of the Council of the Pacific Division. The Council of the AAAS, Pacific Division, will hold its annual business meeting and breakfast at 7:00 am on Wednesday, June 18, in the Seven Hills Center. The Council will elect officers, discuss programs for the 2004 annual meeting, and transact such other business as required by the Division's By-Laws.

AAASPD day at the California Academy of Sciences. Paid meeting registrants will have an additional opportunity to visit the California Academy of Sciences at reduced or no cost. Days being considered are Sunday, June 15, and/or Thursday, June 19. Additional information will be posted on the AAASPD website as it becomes available.

Trivia Question. This famous San Francisco football player was recently photographed sitting around in the Skulls exhibit at the California Academy of Sciences. The first person to appropriately name him wins a free and postpaid Pacific Division publication of his or her choice (see list on page 30). Replies must be received in the Pacific Division office by March 31, 2003. E-mail your entry to aaaspd@sou.edu or address it to AAAS, Pacific Division, TRIVIA QUESTION, Southern Oregon University, Ashland, OR 97520. The name of the winner will be posted on the Division website, pacific.aaas.org.

PUBLIC LECTURES

Sunday, June 15, at 7:30 pm in the Coit Lounge, Seven Hills Center: "Botanical Heroes and the Flora of San Francisco," *Dr. Thomas Daniel* (Botany Department, California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118).

Monday, June 16, at 12:15 pm in the Nob Hill Room, Seven Hills Center: "Memory and Cognition: What are They?" *Dr. Fred C.C. Peng* (Neurological Institute, Department of Neurosurgery, Veterans General Hospital-Taipei, Taipei, Taiwan 11217).

Monday, June 16, at 7:00 pm in the Nob Hill Room, Seven Hills Center: Annual Presidential Lecture, *Dr. John*

J. Carroll (Atmospheric Sciences Section, Department of Air, Land and Water Resources, University of California, Davis, CA 95616), President of the Pacific Division.

Tuesday, June 17, at 12:15 pm in the Nob Hill Room, Seven Hills Center: Noon Lecture, TBA.

Tuesday, June 17, starting at 6:00 pm in the Morrison Auditorium, California Academy of Sciences: Series of short talks on the history and future of the California Academy of Sciences. Speakers tentatively are *Dr. Alan E. Leviton* (Department of Herpetology, California Academy of Sciences), *Dr. Peter H. Raven* (Director, Missouri Botanical Garden) and *Dr. Patrick Kociolek* (Director, California Academy of Sciences).

Wednesday, June 18, at 12:15 pm in the Nob Hill Room, Seven Hills Center: Noon Lecture, TBA.

FIELD TRIPS

All field trips are open to meeting registrants and their families. Due to limited space, advance registration is required for all trips. Reservation and payment of field trip fee(s) are included on the Advance Registration Form.

A full refund will be granted if a trip is cancelled by the Division. If a registrant cancels via e-mail, phone, or written notification postmarked by May 12, 2003, the registrant will receive a refund of the paid fee(s) less a \$10 processing fee. If paid by credit card, an additional 3% will be deducted from the amount being refunded.

The following field trips are in the planning stage:

Sunday, June 15: 9:00 am–5:00 pm. (1) *Monterey Bay Aquarium and Hopkins Marine Station.* Limited to 18 participants. Includes transportation, admission fees and sack lunch. Fee: \$45.

Sunday, June 15: 9:00 am–5:00 pm. (2) *Streetcar to Subduction—2003 Version.* This trip will examine, in downtown San Francisco, critical rock outcrops that display various aspects of the general geology of the Bay Region, especially as it reflects the processes of plate tectonics acting on the western margin of North America. The trip will be an abridgement of the original concepts of Clyde Wahrhaftig who prepared, in the 1980s, a general guide for a series of trips by public transport. Limited to 18 participants. Includes transportation, field guide and sack lunch. Fee: \$35.

Wednesday, June 18: 8:00 am–5:00 pm. (3) *Western Society of Soil Science field trip.* Details will be posted on the Pacific Division website, pacific.aaas.org, as they become available. Includes transportation and box lunch. Fee: \$35.

Thursday, June 19: 8:00 am–5:00 pm. (4) *Earthquakes, Faults, and Plate Interactions in the San Francisco Bay Region.* Limited to 18 participants. Includes transportation and box lunch. Fee: \$35.

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AAASPD Rita W. Peterson Award for the Outstanding Presentation in Science Education: Candace J. Lutzow-Felling (Botany Department and Ecology, Evolution and Conservation Biology Program, University of Hawai'i at Manoa), "A Conservation Biologist in the K-12 Classroom: Terrestrial Field Ecology for the 6th Grade."

AAAS Robert I. Larus Travel Award: Christian A. Rygh (Department of Geography and Environmental Studies, University of Hawai'i at Hilo), "GIS Applicability to Agro-ecosystems Research: A Case Study Mapping the Insect Community of a Hawaiian Banana Patch."

Christian Rygh (L) discussing his poster, "GIS Applicability to Agro-ecosystems Research: A Case Study Mapping the Insect Community of a Hawaiian Banana Patch," with a meeting participant.

AAASPD Combined Archaeology, Psychology and Health Sciences: Riley A. Arthur, (South Pacific Academy, American Samoa), "Ancient Quarries of Tutuila" [first place]. Tamia McKeague (University of Hawai'i at Hilo), "An Empirical Test of Different Models of Adolescent Mental Health" [honorable mention].

AAASPD Combined Agriculture, Horticultural and Biological Sciences: Darla J. White (Marine Science Department, University of Hawai'i at Hilo), "Ciguatera in Hawai'i: Distribution of Toxigenic Dinoflagellates, Ciguateric Fish and Related Abiotic and Biotic Factors" [first place]. Leona Flores (Department of Biological Science, California State University, Fullerton), "Characterization of the Nuclear-encoded Genes that Regulate the Translation of the Chloroplast-encoded psbA mRNA of *Chlamydomonas reinhardtii*" [second place]. Sara M. McCutcheon (Marine Science Department, University of Hawai'i at Hilo), "Nutritional Composition of Edible Hawaiian Macroalgae from Wild Populations" [honorable mention].

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INSTRUCTIONS FOR SUBMITTING PAPERS

Members of AAAS and its affiliated societies, students, teachers, and other scientists are encouraged to participate in the annual meeting and present papers. Those wishing to present a paper at one of the sessions should send a title and abstract (see page 24) to the program coordinator of the society or section at which you would like to present the paper (see page 16 for names and both postal and e-mail addresses.) Abstracts may be submitted electronically as attachments via e-mail or by regular mail. If submitting by mail, it will be helpful if the abstract is submitted on disc, preferably using Microsoft Word, to accompany the paper copy. Copies of all abstracts should also be addressed to the Division's meetings office, again either electronically as an e-mail attachment, to aaaspd@sou.edu, or to the postal address: AAAS, Pacific Division, Department of Biology, Southern Oregon University, Ashland, OR 97520.

STUDENT AWARDS FOR EXCELLENCE

The AAAS, Pacific Division, offers each affiliated society and section participating in the annual meeting an opportunity to recognize outstanding student participants through the presentation of certificates of merit and cash prizes of \$175 for first place and \$100 for second place. Several societies supplement these awards with their own cash prizes.

In 2003, seven Division-wide awards will be given: Laurence M. Klauber Award for Excellence (unrestricted); Geraldine K. Lindsay Award for Excellence in the Natural Sciences; J. Thomas Dutro, Jr., Award for Excellence in the Geosciences; Presidents' Award for Excellence (unrestricted); Rita W. Peterson Award for Excellence in Science Education; Best Poster Award (for poster presentations only but otherwise unrestricted); and the AAAS-Robert I. Larus Travel Award, which provides for travel and other expenses for the awardee to attend the 2004 annual meeting of AAAS in Seattle WA, February 12-17, and present their paper as a poster.

The Klauber, Lindsay, Dutro, Presidents', Peterson, Best Poster, and Larus awards are given to those students whose presentations are judged the most significant in the advancement or understanding of science. To be eligible, a student must: (1) register for the meeting, (2) present the paper or poster, (3) be the principal research investigator. Student presentations, oral and poster, are judged on their abstracts, content, style of delivery or presentation, and audiovisual aids and/or handouts (if used). The evaluation forms for both oral and poster presentations are posted on the Division's website. Students who register for the meetings and present papers are invited to be the Division's guests at the Division Dinner, which follows the presentation of student awards at the California Academy of Sciences Tuesday evening, June 17.

TECHNICAL SESSIONS

SYMPOSIA

The following symposia are planned for the annual meeting. Although most symposia are organized around invited papers, organizers often will consider adding one or more contributed papers if they are relevant to their programs. Should you wish to participate in one of these symposia, contact the symposium organizer whose name and e-mail address is given. Should you wish to present a paper in one of the contributed paper sessions, refer to pages 16 and 24 of this *Newsletter* (also check the Division's website, *pacific.aaas.org*, for the latest information on symposia and other program events).

Please remember, at this time the listings below are tentative and subject to change, as are the time slots. If you plan to attend the meeting largely for one symposium or technical session, check the Division's website for updates to the program or phone the Division's meeting office at 541-552-6869 to confirm the status of the session(s) you want to attend before committing travel funds. Also, as additional symposia are added to the program they will be posted on the web and will also appear in the Spring *Newsletter*.

(1) Biodiversity: Past, Present and Future, organized by Stan Blum, Brian Fisher, Michael Ghiselin, Nina Jablonski (co-chair) *njablonski@calacademy.org*, Alan Leviton (co-chair) *alevito@calacademy.org*, and Peter Roopnarine (California Academy of Sciences). Scheduled for all day Monday and Tuesday, June 16 and 17. This symposium is part of the 150th anniversary celebration of the California Academy of Sciences.

The California Academy of Sciences is an institution dedicated to the discovery and documentation of biodiversity. In this symposium, scholars who have studied many aspects of the world's biodiversity will gather to reflect on what we know about biodiversity today and to consider directions for future initiatives in education and research related to the documentation and preservation of biodiversity. Many topics will be explored, including:

- Why knowledge about biodiversity is important to science and our world
- The assessment of past and present biodiversity
- Do we need to know about all species?
- Global patterns of biodiversity in the past, in relation to environmental change
- Can the past help to predict the future? Global patterns of modern biodiversity
- Biotic responses to modern environmental change
- Conservation genetics
- Habitats and species at greatest risk
- Invasive species

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April Agee (Department of Biological Science, California State University, Fullerton), "Arabidopsis Protease Activity Increases as a Result of Exposure to Ultraviolet Radiation" [honorable mention].

AAASPD Ecology and Environmental Sciences: Christian A. Rygh (Department of Geography and Environmental Studies, University of Hawai'i at Hilo), "GIS Applicability to Agro-ecosystems Research: A Case Study Mapping the Insect Community of a Hawaiian Banana Patch" [first place]. Brooke Stuercke (Marine Science Department, University of Hawai'i at Hilo), "Algal Turf Composition at Two Sites on the Island of Hawai'i" [second place].

EXECUTIVE COMMITTEE AND COUNCIL MEETINGS

The Division's Executive Committee met on Wednesday, June 12. At the meeting, chaired by Division President Nina Jablonski, the Executive Director reported on Division activities during the preceding five months, reviewed Division finances, and presented a budget for 2003 for approval. Dr. Curtis Garniss, Retiring President of the Division, placed the name of Dr. William B.N. Berry (University of California, Berkeley) in nomination for the Division Leviton Award (see article on page 18), which was affirmed unanimously.

The Council met on Saturday, June 15, to consider various recommendations from the Executive Committee and other business of the Division. The Council acted favorably on the Executive Committee's Nominating Committee recommendation of Dr. William B.N. Berry (Professor of Earth and Planetary Sciences, University of California, Berkeley) as President-Elect and also to its own Nominations Committee that Dr. Walter Carl Hartwig (Touro University College of Osteopathic Medicine) and Dr. Matthew J. La Force

Dr. William Berry, Larus Award winner and President-Elect of the Division, ready to enjoy a plate of food at the Division reception Wednesday evening.

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(San Francisco State University) be elected to five-year terms on the Executive Committee. Dr. Armando Galindo was reappointed to an additional three-year term as an at-large representative on the Council and Dr. Michael Zach (University of California, Berkeley) and Mr. Lawrence Larsen (Bureau of Land Management) were both elected to new three-year terms as at-large representatives on the Council. The Council also accepted invitations from three institutions for meetings: San Francisco State University jointly with the California Academy of Sciences, June 15 - 19, 2003; Utah State University, June, 2004; and Southern Oregon University, June, 2005.

Saturday evening Dr. Nina Jablonski moved from the office of Division President to Retiring-President, to resounding thanks and applause for the energy and enthusiasm she brought to the Division and also for her very large part in insuring the success of this meeting. Dr. John J. Carroll assumed the duties of President and formally closed the meeting.

CRATER LAKE CENTENNIAL CELEBRATION

2002 was the centennial celebration of the formation of Crater Lake National Park, with many different activities in various locations marking the event. The Pacific Division participated in the Centennial Symposium, held at Southern Oregon University and Crater Lake on October 1–3, 2002. Pacific Division Exec-

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- Biodiversity, ecosystem function, and ecosystem services
- Public education about biodiversity

Speakers include Anthony Barnosky (University of California, Berkeley), Terry Erwin (Smithsonian National Museum of Natural History), Michael McKinney (University of Tennessee), and Chris Wemmer (Smithsonian National Museum of Natural History).

(2) The Future of Taxonomy, organized by Stan Blum, Brian Fisher, Michael Ghiselin, Nina Jablonski (co-chair) njablonski@calacademy.org, Alan Leviton (co-chair) alevito@calacademy.org, and Peter Roopnarine (California Academy of Sciences). Tentatively scheduled for Wednesday morning and afternoon, June 18. This symposium is part of the 150th anniversary celebration of the California Academy of Sciences.

Taxonomy—the science of describing, naming and classifying organisms—is currently undergoing a quiet revolution as biologists from many fields ponder the future role of taxonomy, especially in connection with the documentation of rapidly disappearing biodiversity. As an institution dedicated to systematic biology and taxonomy, the California Academy of Sciences sees the promotion of constructive scholarly dialogue on this topic as very important to the institution and to the advancement of natural knowledge. We hope in this symposium to address several important issues, including:

- the nature of taxonomy
- the status of “traditional” Linnean taxonomy and proposed alternatives
- taxonomy as information science
- the streamlining of taxonomic research
- the importance of all-species inventories
- the training of new taxonomists

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cutive Director Dr. Roger Christianson was a member of the planning committee for the Symposium and organized the poster session. Events began Friday afternoon with the talk, "Geology of Mount Mazama and Crater Lake Caldera," by Dr. Charles R. Bacon (Geologist, Volcano Hazards Division, United States Geological Survey). Later in the evening, keynote speaker Dr. Sylvia Earle (Deep Ocean Exploration Research) gave a talk on various aquatic research projects she has been involved with, including a deep-water submersible project at Crater Lake.

Saturday was a day of technical sessions and talks about the Park. After a welcome by SOU President Dr. Elisabeth Zinser and Crater Lake National Park Superintendent Charles Lundy, participants were able to choose from four concurrent sessions of talks centering on Crater Lake: A Park for Inspiration and Expression, A Park for Education, A Park for People, and A Park for Science and Learning. At lunch, Agnes Baker Pilgrim, an Elder of the Takelma Tribe, shared about the importance of Crater Lake to the Native tribes of the area.

Pacific Division book table at Crater Lake Symposium, staffed by Angie Christianson, AAASPD Executive Assistant and wife of Executive Director Roger Christianson.

Throughout the day Saturday, the poster session was open to participants. It attracted 18 posters by individuals and agencies, all linked to Crater Lake in various ways. Additionally, the Pacific Division operated a book table all day and sold many Division titles, especially the Crater Lake research volume (see photo above).

Sunday was at Crater Lake. Participants chose from several workshops and field trips: Geology of Crater Lake National Park, led by Dr. Charles R. Bacon (Geologist, Volcano Hazards Division, U.S. Geological Survey); Mushrooms and Truffles of Crater Lake, led by Dr. Matt Trappe (Department of Forest Science, Oregon State University); Overview of Park Fire Ecology, led by Mary Rasmussen (Fire Ecologist, Crater

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WOW!

Library Book Packs

LOOK!

\$90 postpaid
(a \$292 value!)

Have library access to all of the AAAS, Pacific Division books that are currently in print. Give this order form to your librarian and request that they place the order today! For only \$90 postpaid, your library will receive one copy of each of the following:

- Agroecosystems and the Environment: Source, Control, and Remediation of Potentially Toxic Trace Element Oxyanions (cloth, 1998)
- San Francisco Bay: The Ecosystem (cloth, 1996)
- San Francisco Bay: Use and Protection (paper, 1982)
- Genecology and Ecogeographic Races (cloth, 1995)
- Cracking Rocks and Defending Democracy: The Life and Times of Kirtley Fletcher Mather, 1888–1978 (cloth, 1994)
- Dietary Factors and Birth Defects (paper, 1993)
- Crater Lake: An Ecosystem Study (cloth, 1990)
- Late Cenozoic History of the Pacific Northwest (cloth, 1985)
- Patterns of Evolution in Galapagos Organisms (cloth, 1983)
- Frontiers of Geological Exploration of Western North America (paper, 1982)

WHILE QUANTITIES LAST!!

Tables of Contents posted at pacific.aaas.org

Yes! Please send us a Library Book Pack.

Attention: _____

Institution _____

Address _____

City, State and Zip _____

Please make check out to **AAAS, Pacific Division**, in the amount of \$90.

The books will be shipped as soon as payment is received.

Questions? Phone 541-552-6869 or e-mail aaaspd@sou.edu

Mail To:

AAAS, Pacific Division, Department of Biology,
Southern Oregon University, Ashland, OR 97520

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Lake National Park); In the Name of Beauty: A Tour Around Crater Lake, led by Stephen R. Mark (Park Historian, Crater Lake National Park); Protecting the Park and the Public; Hike to Garfield Peak, led by Gregg Pohll (Seasonal Park Ranger, Crater Lake National Park); Behind the Scenes: Maintenance at Crater Lake National Park; and Junior Ranger Program, led by Nina Ferrante (Seasonal Park Ranger, Crater Lake National Park). The day culminated with a tri-tip and chicken barbecue on Picnic Hill at Rim Village in the Park.

The symposium attracted about 150 registrants and was praised by all who participated.

•new applications of taxonomic research.

Speakers include Peter Forey (Natural History Museum, London), Michael Ghiselin (California Academy of Sciences), Charles Godfray (Imperial College, U.K.), Alessandro Minelli (International Board of Zoological Nomenclature), and Kevin de Queiroz (Smithsonian National Museum of Natural History).

(3) The Bioregional Vision in Science and Art, organized by Robert Chianese (California State University, Northridge) and Carl A. Maida (University of California, Los Angeles; cmaida@ucla.edu). Tentatively scheduled for Tuesday afternoon, June 17.

The way we look at land determines our attitude toward it. Whether we think about revering, saving, owning, reshaping, or developing it follows from our conceptions and perceptions of the very scene before us. Seeing is a formative process and reveals our conscious values and hidden assumptions about our own personal, social, and cultural relationships with the natural world. How we see shapes what we do, and few things are more complex than the cross-purposes that clash when a community or area proposes to develop land for residential, commercial, agricultural, industrial, or other uses. Seeing the land's natural character in its bioregional setting is difficult once it is marked by fences, roads, and jurisdictional boundaries of local, state, and national politics. An area may be crisscrossed by lines and borders that disregard its bioregional character as determined by its plants and animals, its watershed, its form, its elevation, or such things as its cultural or spiritual character. This interdisciplinary panel examines the varied and shared ways artists, ecologists, and scientists portray the land from a holistic, boundaryless point of view often in order to urge reconsideration of land use practices and policies. The panel will include presentations on writers, visual artists, ecologists, and scientists who have made the case for looking at the land in a bioregional manner, and it will explore the

shared visions of humanists and scientists in their efforts to influence general and specific land policies that would make areas dedicated to human use more sustainable entities.

(6) Use of Anthropology Toward Government Political and Foreign Policy Goals, organized by Alan Bain (Smithsonian National Museum of History; *baina@osia.si.edu*). Tentatively scheduled for Monday afternoon, June 16.

This session looks at the science of anthropology and explores how it has been used to support government policy. Two of the speakers review United States national and foreign policy: (1) government anthropology and relations with Native American Indians, and (2) the transfer, storage, and exhibition of cultural artifacts from the Ryukyu Islands as a reflection of a foreign policy goal to break the Islands away from mainland Japan and indirectly support the policy itself. The third speaker examines German and Austrian anthropology in Poland during World War Two and how Nazi anthropologists' certification of racial status to individuals and entire villages consigned people of occupied countries to farm or slave labor, military service, the "swamps of the Ukraine" or extermination. The fourth speaker talks about Japanese anthropology in Korea and Taiwan and the use of anthropologists to support Japanese foreign policy in those regions during the Colonial period.

Speakers include: Alan Bain (Archivist, Smithsonian Institution Archives, Washington, DC 20560) "Museum Archives: Anthropology Records at the Smithsonian Institution," Nancy Parezo (American Indian Studies Program, University of Arizona, Tucson, AZ 85721) "Government Policy and Scientists: Bureau of Indian Affairs and Bureau of American Ethnology Anthropologists Researching Native Americans," Gretchen E. Schafft (Applied Anthropologist in Residence, American University) "Anthropological Scientism in Support of Racism and Genocide during the Nazi Occupation of Poland," Kyung-soo Chun (Department of Anthropology, Seoul National University, Seoul 151-742, Korea 82-2-880-6424) "Japanese Colonialism: Anthropology in Korea and Taiwan," Yoko Genka (Archivist, Okinawa Prefectural Archives, 148-3 Arakawa, Haebaru, Okinawa, Japan 901-1105, 81-98-888-3875) "American Anthropology: Exhibitions and Collections from the Ryukyu Islands and United States Foreign Policy in the 1960s-1970s."

(7) The Emerging Field of Astrobiology and Opportunities for the Public Understanding of Research, organized by Carol M. Tang (California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118; *ctang@calacademy.org*)

Astrobiology has become a prime example of interdisciplinary, systems-based scientific inquiry incorporating the fields of astrophysics, biology, geology, chemistry, and paleontology. In addition, with its widespread appeal and dissemination in the media, astrobiology has also become a ve-

hicle for teaching the public about the process of scientific research. This session will introduce the scientific basis for this field and its application in formal and informal education.

(8) Scientists and Teachers Collaborating on Curriculum, organized by Kathleen A. O'Sullivan (Dept. of Secondary Education, San Francisco State University, San Francisco, CA 94132; *kaosul@sfsu.edu*) and Edna DeVore (SETI Institute, Mountain View, CA 94043; *edevore@seti.org*).

Over the past ten years, the SETI Institute, in collaboration with teachers, both local and nationwide, and with scientists from the California Academy of Sciences, NASA Ames Research Center, colleges and universities, and other institutions, has been involved in the development of science curriculum materials for use in elementary through high school classrooms. These include: Life In The Universe, a series of six curriculum guides for grades 4-8; Voyages Through Time, a year-long, high school curriculum based on the theme of evolution; and Active Astronomy, a set of classroom activities for learning about infrared light. This symposium will begin with a moderated panel of scientists discussing their experiences in working with teachers to develop these materials. Topics to be addressed will include negotiating the breadth and depth of the science content, learning about the present day realities of teaching and classrooms, and working within the constraints of content and instructional standards. The panel discussion will be followed by three simultaneous breakout sessions. Each session will focus on one of the curriculum materials. These sessions will provide overviews of the curricula, demonstrations of sample activities, and discussions of how the pre-college materials can be adapted for introductory science classes at the college level. The organizers' intent is that these sessions be of interest to and useful for both teachers and college faculty. Sample materials will be provided.

Speakers include: Pamela Harman (SETI Institute), Michael Ghiselin (California Academy of Sciences), David Milne (Evergreen College), Yvonne Pendleton (NASA Ames Research Center), Seth Shostak (SETI Institute), Lisa White (Dept. of Geosciences, San Francisco State University).

(9) Changing the Reward System for University Science Professors, organized by Kathleen M. Fisher (San Diego State University, San Diego, CA; *Kfisher@sciences.sdsu.edu*).

How do we change the reward system for university science professors? That is the opening question for a symposium to be presented in San Francisco. The answers are varied and should stimulate a lively and, hopefully, productive (or at least thought-provoking) discussion. Donald Short will start by asking "Is this the wrong topic? A time for new ideas." Susan Wykoff will then describe an effort to shift from lectures to interactive engagement and scientific reasoning at Arizona State University. Joyce Ono will describe

efforts to initiate curricular reform at CSU-Fullerton through faculty collaboratives and a professional facilitator. Finally, a fourth speaker (still tentative) may address the culture change needed in universities in order to provide undergraduates with a high quality liberal education that addresses the impact of science and technology on society.

Speakers include: Susan Wykoff (Arizona State University, author of "Changing the Culture of Undergraduate Science Teaching: Shifting from Lecture to Interactive Engagement and Scientific Reasoning", *JCST*, 30(5): 306-312), Joyce Ono (Vice-Chair, Department of Biological Sciences, California State University, Fullerton, CA), and Donald Short (former Dean, San Diego State University College of Sciences and Professor of Mathematics, San Diego State University, San Diego, CA).

Additional Sessions Currently Under Development (in each instance, the organizer would like to hear from those interested in presenting papers): (a) **Diatoms**, organized by Patrick Kociolek (California Academy of Sciences; pkociolek@calacademy.org), (b) **Natural History Museums, Past, Present and Future**, organized by Alan E. Leviton (Department of Herpetology, California Academy of Sciences; alevito@calacademy.org).

Additional ideas for symposia are always welcome but time is of the essence. As soon as possible, potential organizers should submit to the chair of the section in which the symposium will be presented (see list on page 16) a title, brief description of the symposium, and list of potential speakers and/or titles of presentations. Once approved, the symposium information will be added to the Division's website. The information will also appear in the *Spring Newsletter*. At the present time, we are also considering ideas for the 2004 annual meeting in Logan, Utah. See the "Call for Workshops and Symposia" on p. 25.

CONTRIBUTED PAPERS

Those wishing to submit papers for presentation at a contributed paper session should refer to the "Call for Papers" form in this *Newsletter* (see page 24) or download instructions from the Division's website (pacific.aaas.org). Send a copy of the title and abstract (see page 24) to the Division's Meetings Office at aaaspd@sou.edu and to the program coordinator of the society or section at which you would like to present the paper (see page 16 for postal and e-mail addresses). Abstracts should be submitted electronically as attachments via e-mail. If you are unable to do this, you may submit your abstract via regular mail. If submitting by mail, it is helpful if it is sent as a text file (Microsoft Word preferred) on either diskette* or CD-ROM, as well as a paper copy. If submitting your abstract by regular mail, address it to AAAS Pacific Division Meeting Office, Department of Biology, Southern Oregon University, Ashland, OR 97520.

Do not forget, the deadline for submitting titles and abstracts is April 25, 2003. If a title comes in after this date, it may not make it into the program. Also, be aware that the abstract you submit will be published as written. It will not be edited. If it contains errors, they will appear as submitted. Use your word processor's spell checker. And remember, keep the length of your abstract within the limits stated in the directions for preparation of abstracts. Use 10-point Times (or variation) font (no exotic fonts, please!) for your abstract. An abstract submitted in a smaller type size will be reformatted to 10 point, and if it exceeds the limits of a box of 4.5" w x 5" h, it will not be published. Lastly, if yours is a student presentation, oral or poster, please state clearly that it is such so that it will be included in the judging competition.

*Please note: Diskettes are formatted for either Mac or IBM systems. The formats are not compatible, so please check with your program coordinator for the preferred format if you plan to send a diskette. The Division's Meetings Office prefers Mac format. This is not a problem if you send your abstract electronically as an e-mail attachment or if it is sent on a CD-ROM.

PACIFIC DIVISION AFFILIATED SOCIETIES AND SECTIONS ACCEPTING CONTRIBUTED PAPERS FOR PRESENTATION AT THE MEETINGS

Western Society of Soil Science. Section Chair and Program Coordinator: Matthew J. La Force, Dept. of Geosciences, San Francisco State University, 1600 Holloway Avenue, TH 509, San Francisco, CA 94132-4163. Phone: 415-338-6869; e-mail: lforce@sfsu.edu.

Agriculture and Horticultural Science. Section Chair and Program Coordinator: Rhonda L. Miller, Dept. of Agricultural Systems Technology and Education, Utah State University, Logan, UT 84322-2300. Phone: 435-797-3772; e-mail: rlmiller@cc.usu.edu.

Anthropology and Archaeology. Section Chair and Program Coordinator: Nina Jablonski, Dept. of Anthropology, California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118. Phone: 415-750-7161; e-mail: njablonski@calacademy.org.

Atmospheric and Oceanographic Sciences. Section Chair and Program Organizer: John Carroll, Atmospheric Sciences Section, Dept. of Land, Air and Water Resources, University of California, Davis, CA 95616. Phone: 530-752-3245; e-mail: jcarroll@ucdavis.edu.

Biological Sciences. Section Chair and Program Coordinator: Anne Michelle Wood, Dept. of Biology, University of Oregon, Eugene, OR 97403. Phone 541-346-0454; e-mail: miche@darkwing.uoregon.edu.

Chemistry. Section Chair and Program Organizer: Owen M. McDougal, Department of Chemistry, Southern Oregon University, Ashland, OR 97520. Phone: 541-552-6407; e-mail: mcdougao@sou.edu.

Computer and Information Sciences. Section Chair and Program Organizer: Alan E. Leviton, Dept. of Herpetology, California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118. Phone: 415-752-1554; e-mail: aleviton@calacademy.org.

Earth Sciences. Section Chair and Program Organizer: J. Thomas Dutro, Jr., U.S. Geological Survey (E-308), National Museum of Natural History, Washington, DC 20560-0137. Phone: 202-343-3222; e-mail: dutro.tom@nmnh.si.edu.

Ecology and Environmental Sciences. Section Chair and Program Organizer: Michael Parker, Department of Biology, Southern Oregon University, Ashland, OR 97520. Phone: 541-552-6796; e-mail: parker@sou.edu.

Education. Section Chair and Program Organizer: Kathleen M. Fisher, Center for Mathematics and Science Education, 6475 Alvarado Road, Suite 206, San Diego State University, San Diego, CA 92120. Phone: 619-594-4453; e-mail: kfisher@sciences.sdsu.edu.

Engineering and Industrial Sciences. Section Chair and Program Organizer: Henry Oman (Boeing Company, ret.),

19221 Normandy Park Drive SW, Seattle, WA 98166. Phone 206-878-4458; e-mail: homan@ieee.org.

Health Sciences. Section Chair & Program Organizer: Carl Maida, UCLA Div. General Internal Medicine & Health Services Research, Department of Medicine, School of Medicine, Center for Health Sciences, 10833 LeConte Avenue, Los Angeles, CA 90095. E-mail: cmaida@ucla.edu.

History and Philosophy of Science. Section Chair & Program Organizer: Michele L. Aldrich (Cornell University), 24 Elm Street, Hatfield, MA 01038. Phone: 413-247-5828; e-mail: 73061.2420@compuserve.com.

Psychology. Section Chair & Program Organizer: J. Ken Nishita, California State University, Monterey Bay, 100 Campus Center, Seaside, CA 93955-8001. Phone: 831-582-3563; e-mail: ken_nishita@csumb.edu.

Social, Economic and Political Sciences. Section Chair & Program Organizer: Mark Aldrich, Dept. of Economics, Smith College, Northampton, MA 01063. Phone: 413-585-3603; e-mail: maldrich@smith.edu.

2004 PACIFIC DIVISION ANNUAL MEETING IN LOGAN, UTAH

At the June meeting of the Pacific Division Council, the invitation from President Kermit Hall of Utah State University to hold our 2004 meeting on his campus was unanimously accepted.

Utah State University is located in Logan, UT, in the beautiful Cache Valley, about 70 miles NE of Salt Lake City. The University, established as Utah's land-grant institution in 1890, was first named the Agricultural College of Utah. Starting with a handful of students in the late 1800's, Utah State presently serves about 22,000 students each year.

The Pacific Division has held several successful meetings on the Logan campus, most recently in 1998.

Dr. Lynn Dudley (Department of Plants, Soils and Biometeorology, Utah State University) is chairing a multi-disciplinary program organizing committee on campus in order to develop a very interesting program of symposia, workshops and field trips for the meetings. It's not too early to be thinking about program for the Logan meeting and Dr. Dudley invites your suggestions (see the Call for Workshops and Symposia on page 25 of this *Newsletter*). You may write to him at Utah State University, Logan, UT 84322-4820, or contact him by phone: 435-797-2184, fax: 435-797-3376 or e-mail: ldud@mendel.usu.edu.

2005 PACIFIC DIVISION ANNUAL MEETING IN ASHLAND, OREGON

At the same time as accepting the invitation to hold our annual meeting at Utah State University in 2004, the Council unanimously accepted the invitation from Southern Oregon University President Elisabeth Zinser to hold our 2005 meeting on her campus.

Southern Oregon University is located in Ashland, OR, about 14 miles north of the California border on Interstate-5. It is conveniently located within 12 hours or so driving time from every metropolitan area on the west coast. Ashland is perhaps best known as the home of the Oregon Shakespeare Festival, with many other theater and musical groups (such as the Britt Music Festival in Jacksonville) close-by. Additionally, Ashland is situated in a very interesting biogeographical area. Located at the south end of the Rogue Valley, where the Cascade and Siskiyou Ranges meet, visitors will have access to a large variety of intriguing ecosystems, such as those associated with serpentine soils, dormant volcanoes and old lava flows, and the recently created Cascade-Siskiyou National Monument.

Ideas and proposals for the Ashland meeting may be forwarded to the Pacific Division office, which is also in Ashland. Address proposals to: AAAS, Pacific Division, Southern Oregon University, Ashland, OR 97520, or e-mail: aaaspd@sou.edu.

BERRY RECEIVES 2002 LEVITON AWARD

At the recent meeting in Hawai'i, Dr. William Berry (University of California, Berkeley) was awarded the AAASPD Leviton Award for his pioneering work in developing an educational program of hands-on environmental studies for "at-risk" high school students. Dr. Berry developed the program at Galileo Academy (formerly Galileo High School) in San Francisco, drawing on his experience at the West Hawaii Exploration Academy, a high school in Kaa Lua-Kona, Hawai'i, where a large number of students were performing poorly and dropping out. Prior to development of the program, Galileo Academy was experiencing a dropout rate of greater than 50%, especially among African-Americans. More than 80% of the students at Galileo Academy are ethnic minorities. English is a second language for 55% of the students and 28% are "learning impaired." The environmental studies program developed by Dr. Berry has significantly decreased the dropout rate by giving students an opportunity to work on projects that not only hold their attention and interest, but which may also prove to be of value to the community. This program has also encouraged students to pursue college degrees and to see the possibilities of significant employment when they enter the job market. The program now extends into middle schools and to Pittsburg and Antioch in Contra Costa County, where Dow Chemical Co. has volunteered 260 acres of wetlands for studies. Congratulations on your excellent work, Dr. Berry!

NOMINATIONS DUE FOR 2003 LEVITON AWARD

The purpose of the Leviton Award is to recognize outstanding achievement in the education of children and youth in science. Individuals considered for the award are those who:

- demonstrate a long-term commitment to and a history of sustained contributions to the education of children and youth in science,
- cultivate a sense of curiosity and wonder about the natural world and the universe and foster in children and youth a desire to explore and discover in science,
- instill a scientific view of the world and encourage original thought,
- demonstrate innovative or distinctive instructional approaches to teaching or reaching all kinds of minds, and
- motivate children and youth to achieve excellence in science and consider possible careers in science.

Any person may nominate a candidate who resides in the area of the Pacific Division for the Leviton Award by preparing a written description of the candidate's qualifications in relation to the qualifications above, and submitting the nomination no later than April 1, 2003 to Roger Christianson, Executive Director, AAAS, Pacific Division, Southern Oregon University, Ashland, OR 97520.

The recipient of the Leviton Award will be invited to the annual meeting and will be presented at the Division Dinner an award describing his/her achievements.

The Evolution of Human Skin Coloration

Nina G. Jablonski

President, AAAS Pacific Division, 2001–2002

[Editor's Note: This is the full text of the Presidential Address given by Dr. Jablonski at the Hawaii Preparatory Academy, Waimea, Hawai'i, on the evening of June 19, 2002, at the close of the 83rd annual meeting of the AAAS Pacific Division.]

Skin coloration is something everyone notices, but no one talks about, whether it be in general or scientific circles. It is one of the most obvious ways in which people vary, and has been used in the past as a basis for the classification of humans by "race".

Dr. Nina G. Jablonski.
(Photo courtesy California Academy of Sciences)

I began studying the evolution of human skin coloration quite by accident, as the result of giving a lecture to a class of introductory human biology students over 10 year ago. After preparing and giving that lecture, I realized just how little was known with certainty about the evolution of human skin coloration. Over the months immediately following that lecture, I came into contact with colleagues and information from the field of epidemiology that clearly related to the evolution of human skin coloration, but had not been explicitly connected with it. In the last five years, even more data have become available that

pertain to this story, and many of these are geographic and remotely sensed environmental data. Incorporation of geographic information systems (GIS) analyses have become critical elements of this study, and for these I must thank my collaborator and husband, George Chaplin.

Anthropologists and geographers have been interested in human skin coloration and its geographical pattern for over a century. Some of the first systematic attempts to record variation in skin coloration among indigenous peoples involved the use of glazed tiles in skin-like colors that were matched to a patch of unexposed skin on the arm of a human subject. Anthropologists matched skin colors with these Van Luschan Tablets in much the same way that we today use paint chips from the hardware store. Unfortunately, the assessments of human skin coloration made using these tablets were not reliable, so in the 1950s the assessment of skin coloration was placed on a more modern and reproducible footing with the introduction of reflectance spectrometry. This technique involves the shining of light of a given wavelength on a patch of skin, and measuring what percentage of the emitted beam is reflected by the skin. Lighter skin reflects more light and produces higher skin reflectance values; darker skin reflects less light and produces lower values.

By the late 19th and early 20th centuries, maps showing the skin coloration of the world's indigenous peoples had been produced. These maps showed that human skin coloration was not randomly distributed, but that darker peoples were found nearer the equator and lighter peoples nearer the poles. Skin coloration generally exhibited a gradual cline as one moved from one latitude to another; there were few sharp discontinuities. The early maps also showed that humans in the Neotropics tended to be lighter than their fellow humans in the Old World tropics. Having established these geographic trends, the anthropologists of the 20th century sought reasons for their existence.

There are several pigments that contribute to the color of human skin, but I will concentrate in this talk on the evolution of melanin pigmentation in the skin. Melanin is nature's natural sunscreen. It is a large organic molecule, which serves the dual purpose of physically absorbing ultraviolet radiation (UVR) and also chemically neutralizing the harmful oxidative species produced by the interaction of UVR with the contents of cells in the skin.

Most students of human skin coloration have examined the geographic cline of skin pigmentation and concluded that it represents some kind of adaptation to the physical environment. Because of its marked latitudinal distribution, skin coloration was long assumed to be associated with sunlight. In the early 1970s, the English anthropologist and geneticist Derek Roberts and his colleagues established clearly that skin coloration was most strongly correlated with UVR, of all the environmental parameters that he could easily quantify. Thus, darker skin had evolved in regions of the world that experienced higher levels of UVR. The question then became what did the melanin in the skin actually protect against? Some of the earliest explanations connected higher levels of melanization with protection against sunburn, UV-induced damage to sweat glands, and skin cancer. But these explanations were effectively countered by pundits who noted correctly that such deleterious effects would rarely have an impact on an individual's ability to produce offspring. (Even malignant melanoma, which accounts for approximately 4% of skin cancer diagnoses, is rarely fatal in early reproductive life.) If a putative "adaptation" does not affect reproductive success, then it is not a true adaptation in the Darwinian sense. Therefore, if skin coloration is an adaptation, variations in skin coloration must have been determined on the basis of their relative reproductive success under specific environmental regimes.

Our research on the evolution of human skin coloration has led us to conclude that skin pigmentation is adaptive, and that the role of melanin pigmentation in the skin is to regulate the penetration of UVR into the skin. We have concluded, further, that the degree of skin pigmentation regulates both the breakdown of UVR-sensitive compounds and the biosynthesis of UVR-dependent compounds.

Previous studies on human skin coloration have suffered from a lack of good environmental data against which trends in human skin coloration could be assessed. Thanks to the availability of several new digital data sets of global environmental data, this problem is no longer the great obstacle it once was. The most important environmental data set for our work turned out to be a compilation of remotely sensed data of UVR at the Earth's surface, collected by the NASA TOMS satellite. This satellite collected data on levels of "UVMED," or minimal erythemal dose of UVR — the quantity necessary to produce a barely perceptible reddening of light skin. We utilized the very large NASA TOMS UVMED data set collected between 1978 and 1993, which comprised 37,400 readings for each day over most of the Earth's surface. We distilled this large data set into a more manageable measure, the annual average UVMED, and it is that average against which we compared human skin reflectance values.

The distribution of UVR on the Earth's surface is not uniform; it varies markedly by latitude and altitude. Also the different wavelengths of UVR do not reach the Earth's surface in equal amounts, with long wavelength UVR (i.e., UVA), comprising about 94% of the total. One of the most interesting geographical trends that one observes is that there is a much larger area of land in the Northern Hemisphere that receives little UVR during the year compared to the Southern Hemisphere. The land masses of the Southern Hemisphere are concentrated closer to the equator, whereas those of the Northern Hemisphere are concentrated between the Tropic of Cancer and the Arctic Circle. This basic land mass bias has had a profound influence of the evolution of human skin color in both hemispheres.

In our study of the evolution of skin coloration, the basic data on skin reflectances in indigenous populations were collected from the literature. The data set was far from perfect: Reflectance measurements for many groups, especially in the New World, were nonexistent, and data representing males were more common than those representing females. It was, however, the largest single collation of human skin reflectance measurements ever compiled.

The primary insight that really got this project going in the early days was quite simple. It has been known since the late 1970s that folate, one of the B vitamin group, can be broken down *in vivo* and *in vitro* by UVR. The importance of folate to maintenance of good health and reproductive success, however, is only now being fully appreciated. Folate is essential for DNA synthesis, and so is critical to all processes in the body requiring high levels of cell proliferation. Some of the highest levels of cell duplication occur during early stages of development in the embryo, and in the production of sperm cells in males. Without sufficient folate, both of these processes suffer. In connection with the former, my colleagues, Fiona Stanley and Carol Bower, at The University of Western Australia were among the first to establish the connection between folate deficiency and a large class of birth defects called neural tube defects (NTDs), including spina bifida. When I learned of their results, I realized that here was the link between the breakdown of folate by UVR and a reduction of reproductive success. NTDs are debilitating and, often, fatal developmental defects; folate supplementation is now thought to be able to prevent at least 70% of such defects. Here, at last, was the beginning of an explanation for the evolution of human skin coloration that made real sense in terms of natural selection.

How does one prove such an hypothesis? Clearly, this is not a case where you can voluntarily subject women in the early stages of their pregnancies to UVR and see what happens. Therefore, we trolled the literature to find relevant evidence, and were rewarded by a short, but important case study reported by an Argentinian pediatrician, Pablo Lapunzina. In his practice, Lapunzina had attended three ostensibly healthy young women who had given birth to fetuses or still-born infants with NTDs. The only thing that they shared was their attendance at tanning parlors and their use of "sun beds" during the first few weeks of their pregnancy. Sun beds give off high doses of long wavelength UVR (UVA), and may have been responsible for a catastrophic decline in folate levels in the three women, leading to their embryos

developing a serious defect. This was as close to a “smoking gun” as we were likely to find, and we are now awaiting the outcomes of experimental studies of UVR exposure and folate levels to see how this line of evidence develops. If this hypothesis proves correct, the explanation for dark skin among humans living in high UVR regimes would be that the melanin in the skin serves to protect the contents of cutaneous blood vessels, especially the folate contained in the red blood cells and serum, from breakdown by UVR.

Having established a satisfactory working hypothesis for why dark skin may have evolved among humans in the high UVR regimes of the tropics, we sought an explanation for why lighter skin had evolved in more temperate climates with lower UVR levels. The idea that light skin was an adaptation to the lower sunlight levels of high latitudes was first brought forward by anthropologist F. G. Murray in 1934 and elaborated by W. Farnsworth Loomis in 1967. Today, we generally consider that all UVR is harmful. But this is quite unfair because relatively short-wavelength UVR, UVB, is essential to human health because it catalyzes the formation of the precursor to vitamin D (pre-vitamin D) in the skin. Loomis established the importance of vitamin D to reproductive success because of its critical role in enabling calcium absorption from the intestines, which in turn makes possible the normal development of the skeleton. Research led by Michael Holick at the University of Boston School of Medicine has, over the last 20 years, further established the importance of vitamin D in growth and development and the maintenance of a healthy immune system. His team also was able to show that not all sunlight contains enough UVB to stimulate pre-vitamin D production. In the city of Boston, Massachusetts, located at about 42° north latitude, pre-vitamin D only begins to be produced in human skin cells after mid-March. During the winter, there isn't enough UVB to do the job. We realized that this was another essential connection in the skin color story.

What we sought now were data that would allow us to determine the global potential for synthesis of pre-vitamin D in the skin. This required that we acquire a large global data set on UVR levels at the Earth's surface. We were finally rewarded in our search when we contacted Dr. Elizabeth Weatherhead at the Cooperative Institute for Research in Environmental Studies at the University of Colorado in 1996. She kindly shared with us a database of measurements of UVR at the Earth's surface, taken by NASA's Total Ozone Mapping Spectrophotometer satellite between 1978 and 1993. This not only allowed us to visualize the distribution of UVR using a geographic information system, but to relate the satellite data to the information on the amount of UVB necessary to produce vitamin D in the skin. We found that the Earth's surface could be divided into three “vitamin D zones”, one comprising the tropics, one the subtropics and temperate regions, and the last the circumpolar regions north and south of about 45° latitude. In the first, the dosage of UVB throughout the year is high enough that humans have ample opportunity to synthesize pre-vitamin D throughout the year. In the second, there is at least one month during the year when there is not enough UVB in solar radiation to make this possible, and in the last there is not enough UVB, when averaged over the entire year, to catalyze pre-vitamin D synthesis in the skin. This allows us to understand why indigenous peoples of the tropics have generally darkly pigmented skins, why people in the subtropics and temperate regions are lighter-skinned but have the ability to “tan”, and why people in circumpolar regions are generally very light-skinned. One fascinating “side-bar” to this story is that the distribution of “vitamin D zones” sheds some light on the question of why humans populated the globe in the manner they did, that is, tropics first and circumpolar regions last. Humans inhabiting circumpolar regions must have the cultural wherewithal to stay warm and store food. And, because of low levels of UVR, they also must consume a diet of vitamin D-rich foods because they cannot synthesize enough vitamin D from sunlight alone throughout the year. This helps to explain why we find no significant evidence of human habitation in these regions until humans had developed fishing and abilities to hunt

marine and other vitamin-D-rich mammals.

Our analysis of vitamin-D-synthesis potential also permitted us to understand another poorly understood phenomenon related to human skin color: the fact that women in all populations are lighter than men. For many years, scientists have speculated on the reasons for this and have mostly argued that the phenomenon is due to sexual selection – the preference of men for lighter colored women. We contend that this is probably part of the story, but not the original reason for the sexual difference. Females have significantly greater needs for calcium throughout their reproductive lives, especially during pregnancy and lactation, and need to be able to maximize their absorption of the calcium contained in food. We speculate, therefore, that women are lighter-colored than men in order to allow slightly more UVB to penetrate their skin so as to increase their ability to produce vitamin D. In areas of the world with a high UVR load, women really are at the “knife’s edge” of natural selection, needing to maximize the photoprotective function of their skin on the one hand and the ability to synthesize vitamin D on the other.

Our study permits us to make several preliminary conclusions about the evolution of human skin coloration. The first and most important is that skin pigmentation in humans is adaptive, and determines the penetration of UVR into the skin. Skin pigmentation represents a compromise between the demands of photoprotection and pre-vitamin D₃ synthesis. The dual selective pressures have created two clines of skin pigmentation, reflecting the needs to protect against folate photolysis in the tropics and to maximize cutaneous pre-vitamin D₃ synthesis in higher latitudes. Another very important conclusion is that skin pigmentation is labile: Deeply pigmented and depigmented skins have evolved numerous times in human history, as human populations have wandered over and settled most available terrestrial habitats. We can hypothesize that some lineages have gone through alternating periods of depigmentation and pigmentation (or *vice versa*). Today, as the pace of human migrations increases, more people are finding themselves living under conditions of UVR to which they are poorly adapted, with major consequences for public health. This not only involves many obvious cases of skin cancer among pale-skinned folk living in the tropics, but untold losses in terms of lowered fertility as a result of the sinister effects of UVR-induced folate deficiency. Equal in importance are the problems faced by dark-skinned peoples who are now living in far northerly latitudes, such as the northeastern U.S., the U.K., and northern Europe. Many such populations, of African and South Asian origin, are now suffering high prevalences of vitamin-D deficiency diseases, including rickets in children, and are now the focus of remedial public health campaigns. A corollary to this is that, because of its high degree of responsiveness to environmental conditions, similar skin colors have probably evolved independently in evolutionarily distant human groups. Skin pigmentation, therefore, cannot be used to as a basis for construction of human races.

The nature of our attitudes toward skin color is such that one cannot ignore the social weight that this topic carries. Our research bears witness to the power of natural selection in shaping the human body, over the course of thousands of years. The fact that skin coloration in humans is clearly a product of evolution is a cause for celebration and reflection, and brings new meaning to the famous words of the Reverend Martin Luther King: “I have a dream that my four children will one day live in a nation where they will not be judged by the color of their skin but by the content of their character.” The truth may not always set us free, but information – not ignorance – helps us on the road to freedom.

Suggestions for further reading:

Jablonski, N.G. and Chaplin, G. (2002) Skin deep. *Scientific American* (October 2002).

Jablonski, N.G. and Chaplin, G. (2000) The evolution of human skin coloration. *Journal of Human Evolution* 39:57-106. Abstract at: <http://www.idealibrary.com/links/doi/10.1006/jhev.2000.0403>

American Association for the Advancement of Science Pacific Division

84th Annual Meeting San Francisco State University and the California Academy of Sciences June 15–19, 2003 Call for Papers

Members of AAAS and its affiliated societies, students, teachers and other scientists are encouraged to participate in the annual meeting and present papers and/or posters. Persons wishing to present a paper or poster at one of the sessions should e-mail the title, abstract and other required information (see instructions below) to the chair of the appropriate society or section (see page 16) and also the Pacific Division office, aaaspd@sou.edu. The deadline for submission is April 25, 2003. Students must identify themselves so that judges will be able to evaluate their presentations for awards of excellence.

Please format your submission as follows:

Line 1: Your name

Line 2: Your telephone number and e-mail address

Line 3: Name of presenter (if different from above)

Line 4: Presenter's telephone number and e-mail address

Line 5: Society, section or symposium to which you are submitting your presentation

Line 6: Is the presentation oral or a poster?

Line 7: Special equipment needs (other than 35mm and overhead projectors)

Line 8: Is the presenter a student?

Line 9: Paper title in title case and italics (i.e. *Paper Title in Title Case*)

Author(s) name(s) in **ALL CAPS AND BOLD**

Full address(es), including institution, mailing address, city, state and zip code.

Line 10: Leave blank

Line 11: Text of abstract. Limit: 250 words.

Example of properly formatted abstract submission (lines 9-11)

Advanced Knowledge Acquisition in Elementary Biology. **KATHLEEN M. FISHER and STACY GOMES** (Center for Research in Mathematics and Science Education, San Diego State University, San Diego, CA 92120).

Advanced knowledge acquisition differs in important ways from introductory learning. Advanced knowledge acquisition refers to learning a content area beyond the introductory stage but before extensive experience and practice (Spiro, Coulson, Feltovich, and Anderson, 1988). At this stage, knowledge must be reasonably correct and active rather than inert. The goals of learning shift from knowledge reproduction to knowledge use. Advanced students need to become more comfortable with learning in different ways, more adaptive in using and applying knowledge, and more inclined to spontaneously restructure their knowledge. These advanced students are preparing themselves to leave school and enter practice in the workplace. They need to attain a deeper understanding of content material; reason with it; and apply it flexibly in diverse contents (Spiro, et al, 1988, p 375). They need to shift from being passive receivers of information to active organizers and users of their knowledge. In teaching biology to prospective elementary school teachers in their senior undergraduate year, we use a variety of strategies to achieve these ends, including: 1. stimulating curiosity and eliciting prior knowledge; 2. prompting students to build runnable mental models through prediction and interpretation; 3. promoting conceptual change by prompting 3a) cognitive disequilibrium and 3b) knowledge elaboration and by presenting 3c) ill-structured cases and 3d) knowledge construction activities; 4. promoting students' active learning; 5. providing scaffolding and support for student knowledge construction; 6. diagnosing and remediating underdeveloped cognitive and metacognitive skills; 7. prompting students to identify central ideas; 8. prompting students to integrate ideas; 9. avoiding oversimplification and overregulation; 10. prompting students to construct multiple representations; 11. building confidence and teamwork; and 12. evaluation for meaningful understanding. Two aspects which will be emphasized here are the use of SemNet[®] software to help students develop the skills and habits of meaningful knowledge organization and the use of two tiered multiple choice questions to assess conceptual understanding.

*American Association for the Advancement of Science
Pacific Division*

*85th Annual Meeting
Utah State University
Logan, Utah
June 13–17, 2004*

Call for Workshop and Symposium Proposals

Members of AAAS and its affiliated societies, students, teachers and other scientists are encouraged to participate in the annual meeting by developing workshops and/or symposia. Persons wishing to develop a workshop and/or symposium for the 2004 Logan meeting should e-mail the title, description and other required information (see instructions below) to the chair of the appropriate society or section (see page 16 of this *Newsletter*) and also the Pacific Division office, aaaspd@sou.edu. The deadline for submission is **October 15, 2003**, although late submissions will be considered.

Questions? Contact Dr. Roger Christianson, Executive Director, AAAS Pacific Division, Department of Biology, Southern Oregon University, Ashland, OR 97520. Phone: 541-552-6747; e-mail: rchristi@sou.edu.

Workshops generally are 1/2- or full-day and may or may not accompany a symposium. If special facilities and/or equipment are required, be sure to identify what you need as completely as possible in your submission (see Line 8 below). If a cost is incurred, it will be passed along to participants as a workshop fee.

Symposia may be 1/2- or full-day or longer. Individual presentations are usually scheduled with more time than for contributed papers (30 minutes rather than 20 minutes) but the actual scheduling depends on the needs of the symposium and may be longer or shorter, even a mixture. Please contact Dr. Christianson to discuss your specific needs. When preparing your submission, please indicate which presenters are confirmed (see Line 8 below). If you do not yet have a list of presenters, you may submit a list of potential presentation topics. Please keep in mind that we need as much information as possible early on in order to adequately publicize the symposium.

Format your submission as follows:

Line 1: Organizer's name.

Line 2: Organizer's full mailing address, including academic/professional affiliation, telephone number and e-mail address.

Line 3: Co-organizer (if any).

Line 4: Co-organizer's full mailing address, including academic/professional affiliation, telephone number and e-mail address.

Line 5: Is this a Workshop or a Symposium?

Line 6: Number of 1/2-day (roughly three hours, depending on the needs of the program) sessions needed.

Line 7: Title of proposed program.

Line 8: If a symposium, list the name of each (proposed) speaker, including academic/professional affiliation, telephone number and e-mail address for each. Topic titles are optional at this time and will be requested later, along with an abstract for each presentation (see Call for Papers, page 24).

If a workshop, indicate facilities and/or special equipment required and number of participants that can be accommodated.

Line 9: Brief description of proposed program (please limit to 250 words).

AAAS PACIFIC DIVISION 84th ANNUAL MEETING
San Francisco State University and California Academy of Sciences
15 – 19 June 2003

HOUSING RESERVATION FORM

FOR ON-CAMPUS ACCOMMODATIONS and DINING SERVICES

Note: Do not send this form to San Francisco State University!

Address it to: AAAS Pacific Division, Department of Biology,
Southern Oregon University, Ashland, OR 97520.

To guarantee accommodations, this form and payment must be received at the office of the AAAS Pacific Division no later than Friday, May 2, 2003. Mail the completed form and payment (checks payable to AAAS Pacific Division or credit card information) to AAAS Pacific Division Meetings, Department of Biology, Southern Oregon University, Ashland, OR 97520. You may also fax the form to 541-552-8457 or telephone 541-552-6869 with the information.

Rates for on-campus dormitory housing include most meals (see page 3 of this Newsletter). Four nights, 15 - 18 June, are \$175 per person double occupancy or \$267 single occupancy. Five nights, 15 – 19 June, are \$213 double occupancy or \$317 single occupancy. SFSU is able to accommodate early arrivals up to two days in advance and late stays up to two days beyond the end of the meetings. Instructions for adding extra days may be found on page 4 of this Newsletter. Please note that on-campus parking is an additional charge of \$5/day, paid at the parking structure.

Circle one: Male Female

Name: _____

Mailing Address : _____

City _____ State _____ Zip : _____

Daytime phone : _____ E-mail: _____

If requesting a double,

roommate name : _____ OR please assign a roommate

ACCOMMODATIONS REQUESTED:

4 nights, Sunday, June 15 – Wednesday, June 18

Double Room(s) for ___ persons @ \$175/person = \$ _____

Single Room(s) for ___ persons @ \$267/person = \$ _____

5 nights, Sunday, June 15 – Thursday, June 19

Double Room(s) for ___ persons @ \$213/person \$ _____

Single Room(s) for ___ persons @ \$328/person \$ _____

TOTAL HOUSING \$ _____

(Checks payable to AAAS Pacific Division or credit card)

PLEASE NOTE: Requests for refunds must be in writing and received no later than May 12, 2003. A handling fee of \$10 will be applied. An additional 3% surcharge will be applied to credit card refunds.

CREDIT CARDS

Type of Card: Visa Master Card Discover

Credit Card # _____ Expiration Date _____

Signature _____

COMPLETE AND RETURN FORM WITH YOUR PAYMENT TO:

AAAS Pacific Division, Department of Biology, Southern Oregon University, Ashland, OR 97520.

Should you have questions, send an e-mail to: aaaspd@sou.edu

or call 541-552-6869 M-F between 9:00 am and 1:00 pm Pacific Time.

AAAS PACIFIC DIVISION 84th ANNUAL MEETING

San Francisco State University and

California Academy of Sciences

June 15-19, 2003

ADVANCE REGISTRATION FORM

FOR EARLY REGISTRATION, FIELD TRIPS, AND OTHER SPECIAL EVENTS

Note: Do not send this form to San Francisco State Univ . or the CA Academy of Sciences.

Address it to: AAAS Pacific Division, Department of Biology ,
Southern Oregon University , Ashland, OR 97520.

Name: _____

Mailing Address : _____

City, State, Zip : _____

E-mail : _____ Day Phone: _____

Institution/Company , or City and State (to appear on your name tag): _____

AAAS member: Yes No Society/Pacific Division section affiliation : _____

Will you be presenting a paper or poster? Yes No

If so, in which affiliated society or Pacific Division section? _____

REGISTRATION FEES: Check all that apply.

Full Meeting:

	Received by May 23	Received after May 23	
Professional	<input type="checkbox"/> \$60	<input type="checkbox"/> \$80	
Teacher K-14	<input type="checkbox"/> \$40	<input type="checkbox"/> \$55	
Student	<input type="checkbox"/> \$30	<input type="checkbox"/> \$45	
Spouse	<input type="checkbox"/> \$30	<input type="checkbox"/> \$45	→ Name, City , State (for name tag): _____
Retired	<input type="checkbox"/> \$40	<input type="checkbox"/> \$55	_____

One-day

Professional \$40 \$55 → Select day: Mon. Tues. Wed./Thurs.

DIVISION BANQUET (June 17, Tuesday): The Division banquet will be held at the California Academy of Sciences. It will follow the presentation of Student Awards of Excellence and a mini-talk series on the history and future of the California Academy. Tickets must be purchased in advance. Students who are registered for the meetings and who have presented an oral or poster paper will be guests of the division.

____ tickets @ \$25 each \$ _____ # vegetarian ___ # non-vegetarian
(if no choice is indicated, all meals will be non-vegetarian)

SEE REVERSE FOR FIELD TRIPS AND SUMMARY

FIELD TRIPS: Identify the trip(s) you in which you would like to participate.

- Field Trip #1: Hopkins Marine Station & the Monterey Bay Aquarium on Sunday (see p. 9) ___ tickets @ \$45/person \$ _____
- Field Trip #2: Streetcar to Subduction—2003 version on Sunday (see p. 9) ___ tickets @ \$35/person \$ _____
- Field Trip #3: WSSS Field Trip on Wednesday (see p. 9) ___ tickets @ \$35/person \$ _____
- Field Trip #4: Tomales Bay Earthquake on Thursday (see p. 9) ___ tickets @ \$35/person \$ _____

SUMMARY:

Registration \$ _____

Banquet Tickets \$ _____

Field Trips \$ _____

TOTAL ENCLOSED \$ _____
(Checks payable to AAAS Pacific Division or credit card—see below.)

PLEASE NOTE: Requests for refunds must be in writing and postmarked no later than May 12, 2003. A handling fee of \$10 will be applied. An additional 3% surcharge will be applied to credit card refunds.

To obtain a count of the numbers of people planning to participate in one or more of the events listed below, please indicate the special event(s) you plan to attend by indicating on the appropriate lines how many will attend each function. The opening Cracker Barrel Mixer is available to all participants, as is the Presidential Reception. The Tuesday evening Divisional Banquet requires the purchase of tickets in advance. Students who are registered for the meetings and have presented a paper or poster are guests of the Division at the banquet.

- ___ Cracker Barrel Mixer (Sunday evening, no charge to registrants and family)
- ___ Presidential Reception (Monday evening, no charge to registrants and family)
- ___ Division Banquet (Tuesday evening, at the California Academy of Sciences, \$25 cost)

CREDIT CARDS

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Partial map of Golden Gate Park. The east half of the park and surrounding areas are shown. The California Academy of Sciences is located in about the center of this map. Directions from San Francisco State University: Drive north on 19th Avenue (Highway 1). At the southern border of the park, turn right onto Lincoln Way, then left onto Martin Luther King, Jr., Drive. Follow signs to the Academy. Parking is in a large lot in front of the Academy or on surrounding streets.

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