

# Torreyana

A bimonthly newsletter for  
Torrey Pines State Reserve

Issue No. 241, September 1996



## Docent Society Meeting

September 21st at 9 a.m.

Speaker still to be selected as *Torreyana* goes to press.

## On Dinoflagellates and Red Water

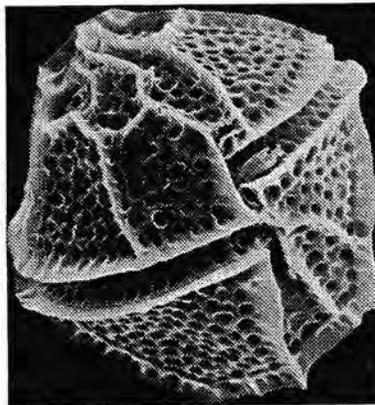
—Freda Reid

As I walk along the Guy Fleming Trail and emerge from the stand of Torrey pines at the northern end I am impressed by the limitless expanse of water which comes into view. Behind me there is a complicated terrestrial ecosystem which we are trying to preserve. In front of me there is an equally intricate oceanic system presenting many questions which we are still trying to answer. I have been part of this effort at Scripps Institution of Oceanography for 40 years, and some of the major problems we have yet to solve satisfactorily are related to the irregular occurrences of the so-called "Red Tides," which are sometimes spectacular as viewed from high points along the coast or when bioluminescence is seen as the waves break on the beach.

The small plants of the open ocean are predominantly members of algal groups of phytoplankton which are mostly free floating. It is hard to imagine the existence of such plants in the churning water. Most of them are single-celled organisms which rely on water movements for transport. Each cell is able to carry out all the essential functions for survival and reproduction. Occasionally some species become so numerous that the water is coloured by their pigments, and streaks of red, brown or yellow can be seen, usually running parallel to the coast. These blooms are found in diverse oceanic locations throughout the world. They are not related to tides so that "Red Water" is a better way to describe them (though the colour is not always red).

Phytoplankton organisms belong to one of three main groups: the dinoflagellates, the diatoms or the microflagellates, each of which has taxa which can produce unusual blooms under special conditions. They range in size from about 2 to 150 thousandths of a millimetre (The cross on this "J" is about 1 millimetre). Dinoflagellates

have a shell or theca composed of cellulose surrounding the protoplasm and prominent nucleus; diatoms have a shell or frustule composed of silica; and the microflagellates are often naked, but some of them (coccolithophorids) have calcareous plates. Many are able to photosynthesize (utilize CO<sub>2</sub> and water in the presence of light to produce carbohydrates). The presence of green chlorophyll in the cell is essential for this to occur and sufficient nutrients must be available. The dinoflagellates also have two slender flagella which give them limited motility and this, together with the ability of many of them to utilize other means of nutrition as well as photosynthesis, leads algologists to wonder whether they are really plants or animals, though traditionally they have been considered to be the former.



*Gonyaulax polyedra*  
SEM image by John D. Dodge.

The coloured waters off San Diego are usually caused by one of two dinoflagellates: *Gonyaulax polyedra* (which has the misfortune to have been recently renamed *Lingulodinium polyedrum*) and *Prorocentrum micans*. These are typical dinoflagellates though from different subclasses. They are about 30-40 thousandths of a millimetre in diameter. Under special hydrographic conditions the cells divide rapidly asexually so that a bloom develops. It can be almost unialgal with only a few cells of other genera. For example *Gonyaulax* is normally found at about a hundred cells per litre, but during a red water occurrence the numbers may increase to well over 2 million cells per liter. The red coloration of the water is due to a pigment in the cell

called peridinin which masks the green of the chlorophyll. Beautiful displays of flashing light in the ocean have been recorded from all the seas of the world. This bioluminescence is emitted by some dinoflagellates after either mechanical or chemical stimulation. Locally this is seen as the waves break onto the shore or as one swims in the water during a dinoflagellate bloom.

Sometimes less pleasant effects are caused by the red water. Some of the dinoflagellates are toxic to fish and shellfish and the toxicity is passed up the food chain as higher animals consume them. The waters off the Florida coast are especially susceptible to blooms of toxic

phytoplankters and aquaculture projects especially in Japan and Norway are particularly at risk. In Southern California there have been few reports of problems but the State of California Health Department regularly samples several coastal sites looking for increases in numbers of potentially toxic forms.

We certainly do not have all the answers, but studying the phenomenon of "Red Tides" is fascinating and the elegant single-cell organisms I see through the microscope never fail to amaze and delight me.

## Docent Announcements

- **October 4-6 CalEPPC (CA Exotic Plant Pest Control) Symposium on Exotic & Invasive Plants.** Eva Armi and other docents will be hosting walks at the Reserve as part of this symposium. Local coordinator, Mike Kelly, welcomes inquiries at 566-6489.
- Don Grine encourages all docents interested in assisting with the design of the new **Torrey Pines State Reserve brochure** to contact him at 481-8783.
- On Saturday, October 5th at 8 a.m., join Hank and Jane Baele at the lower parking lot by the kiosk for the **Torrey Pines State Reserve Monthly Bird Count.** Docents will divide into groups and go into different areas counting species and estimating their numbers. The areas will include all of the upper reserve, the shore and ocean, and the Extension. Please bring binoculars and wear walking shoes. We will use our new bird list to keep score. We should see some early migrants of shore and water birds. Identification by song is acceptable. Beginners and occasional birders are invited. The combined bird list will be compiled and posted each month in the glass information case on the front porch of the lodge. For further information call Hank at: 944-7929.

**Know thy Fellow Docent...(Answers on page 6)**  
Which four artistic docents excelled at this year's Del Mar Fair?  
Which docent spent 25 years working on explosives?



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## A Poem presented at the Children's Programs Appreciation Party/June 1996

-Joan Nimick

To the Children's Program Docents

I am here to sing the praises of a very special group  
If you can stand this long enough, I'll give you all the scoop

Of the two dozen decent docents who delightedly do duty  
By taking kids through Torrey Pines and pointing out the beauty

Of this very special place that all of us hold dear  
And showing them the wonders and the future that is here.  
To all of you who give your time, your expertise and care  
I dedicate this little rhyme and hope that you will share  
Again your dedication throughout the coming year.

There's Jim "I really can't stand kids" who now is Mr. Hero

To all of you whose past experience was just one big zero  
You now can face all kinds of things with poise and equanimity

That once in all your nightmares would have been a big calamity

To Theo whose groups can stalk like a bobcat  
And others who love to point out all that great scat!  
To Wes who tells about fossils and fish and Don about faults and rocks

And all of you who tell stories of hitchhikers in the socks  
To Vida from Germany, Diane, Shirley,  
and Twinx (for spotting the birds that gal has eyes of a lynx).

To Ann, June, Pam and Melanie who all wear many hats-  
Cindy Susan, Ruth and Mary-They point out nests of rats!  
If we're lucky enough to meet a snake we tell them what to do

No screams or shouts or panic-no unseemly hullabaloo!  
To Diana who takes the videos, Claudia, Myrna and John-  
To Joan M. who tell of Indians-The list goes on and on.  
New docents-Marty, Jeannie, Joanne, Mary, Rick and Shelley

They say that this is much more fun than sitting watching telly!

To Barbara, my co-leader, partner and my pal-  
As you well know she really is a most remarkable gal.  
She took up what I had started and she ran with the ball  
Now our program touches hundreds from the Spring throughout the Fall.

So when you go home to sit down to rest, to recover your strength and regain your zest

You'll think of the children you've talked to today-how they listened to your words and what you had to say.

You'll feel a sense of achievement, a great inner glow  
In the knowledge that they will harvest the seeds that you sow.

I'm proud to belong to a group such as this and to show my appreciation

Here's a big smoochie kiss!!

## Reserve Research - An Update

-John Carson

During the past few years TPSR has become the subject of extensive research, the results of which not only add to our understanding of the Reserve but will also provide information needed to help preserve TPSR as it becomes an

island in a commercial-residential area. At the June 95 docent meeting, Resource Ecologist Mike Wells described the beginning of the research projects and presented some initial results (see the July-Aug. 95 Torreyana, pages 4 and 5, for a summary of his talk). Docents were delighted to welcome Mike back at the July meeting to hear his summary of research during the past year. Also participating in the presentation were ESI Stacie Hathaway, who discussed the mammalian carnivore study, and UCSD graduate student Jamie King, who is doing an ant survey. As reports of Reserve research are received at the Lodge, copies will be made available for docent reading (look for the reports by the east window in the docent room). Highlights from the research update are presented below.

**Torrey Pine Stand Density** - Previous studies showed that Santa Rosa Island (SRI) and TPSR Torrey pines have different age distributions. SRI stands have a higher proportion of younger trees, which is characteristic of pines in favorable environments, while the TPSR pines have a distribution that peaks in the 60-80 year age period, characteristic of a declining tree population. As part of a study to understand these age distributions, SDSU graduate student Tony Cario has been doing spatial density measurements at both SRI and TPSR. Every 50 meters along long transects, he has counted trees within 10-meter-radius circles. Results show that the tree stand density (number of trees per unit area) is appreciably higher on SRI. A possible explanation involves the presence of cattle, elk, and deer on SRI; these animals keep the brush "mowed" to the ground, thus facilitating the germination of pine seeds on the ground. Other findings at SRI: the trees are clustered geographically but scattered in age, and most of the favorable growing sites are occupied by pines. In the Reserve's East Grove there are clusters of young trees that correlate with a wildfire in 1972 and prescribed burns in 1984-85. The trees on the east side of the Guy Fleming Trail have a random geographical distribution. So far there is no explanation for the peak in age of the TPSR trees; perhaps it is related to the grazing of cattle here the first part of the century or the planting of Torrey pine seeds or seedlings during the early period when TPSR was a city park.

**Fog Drip** - Jerry Estberg of USD built equipment for measuring fog drip and has been collecting data at TPSR and on San Miguel Island (next to SRI - this location was requested by the National Park Service). The data show much more fog moisture on San Miguel than at TPSR. A possible role of fog in tree growth is the shielding effect that summer fog provides from the sun, thus reducing the evaporative loss of water from the trees and soil. (Author's note: Docent training in recent years has discussed the condensation of fog moisture on pine needles as a source of water for the pines, presumably by the drops falling to the ground. As former TPSR Naturalist Hank Nicol pointed out last year, this amount of water is too small to have an effect on ground moisture. So until the relation between fog and tree growth is clarified, docents may want to be careful what they say regarding this subject.)

**Paleoecology** - During the past year Ken Cole (through a contract with the University of Minnesota) has taken earth

core samples in the Lagoon to determine pollen distribution in previous centuries. Core samples are about 7 centimeters in diameter and have been obtained to a depth of 3 meters. Initial sample locations were both sides of the railroad track and the excavation trench by Sorrento Valley Road. Pollens are identified using a scanning electron microscope, and core ages are determined with carbon 14 radioactive dating. Results have been obtained on the top 1.8 meters of several cores. The oldest sections date back almost 4000 years, and Torrey pine pollen has been identified throughout this entire period. This disproves a conjecture that Native Americans brought seeds here from the Santa Barbara area in recent times. The most common pollen found so far is that of pickleweed. One surprising result is the large amount of grass pollen in the period of 2500 to 3500 years ago. The cores also show a large increase in sedimentation this century: 1 centimeter (cm) per year back to 1955, 0.12 cm/year from 1955 to 1910, and less than 0.1 cm/year prior to then. This recent increase in sedimentation appears to correlate with the increase in runoff into the Lagoon caused by development around the Los Peñasquitos watershed.

**Climatology** - Franco Biondi and associates at Scripps

Institution of Oceanography have been studying possible correlation between ocean temperature and coastal plant communities. As part of this work, they have taken core samples from Torrey pines at TPSR and compared growth rings with weather records of rain, temperature, and fog. First results: For 1892 to 1990, tree growth was strongly related to precipitation for the previous November through the following April; temperature did not appear to have much of a role; and there was some correlation between summer fog and growth, but when fog

was combined with precipitation the fog did not appear to be a significant factor. Core samples were taken from 15 living and 2 dead pines. Of interest to docents is that the oldest age measured so far in TPSR is 168 years. Samples taken a few years ago on SRI Torrey pines yielded maximum ages of about 250 years. According to Mike, those trees, although not very tall, had very large trunks. The research group is currently taking core samples on SRI.

**Ants** - Docents who have learned to recognize the Argentine and harvester ants and thought they knew the Reserve's ants were understandably surprised - and maybe discouraged - to hear that Jamie King has already identified 24 species and expects to find several more. She started this work last fall and collects ants at about 100 sites using baits (coconut, tuna in oil, and cracked wheat) and pitfall traps. The three most common species in TPSR are the Argentine ant (*Linepithema humile* - note: the genus name was changed from *Iridomyrmex*, which is in current field guides), the crazy ant (*Dorymyrmex insanus*), and a harvester ant (*Pogonomyrmex subnitidus*). The crazy ants, so called because of their erratic foraging movements, are about the size of Argentine ants but darker in color; their bodies emit a pronounced rancid odor when squashed. Look for them in the Broken Hills area. There are several genera of ants called harvester ants because of their preference for seeds. *P. subnitidus* is common in Parry



Torrey pine

drawing by Mat

Grove, and a few of another harvester genus, *Messor andrei*, are also in TPSR. The harvester ant shown in California field guides, *P. californicus*, has not been found in TPSR. During the coming year Jamie will be monitoring Argentine ant areas to see if these ants are displacing other ant species, and she will also be studying ant foraging behavior to determine factors that affect it.

**Vertebrate Studies:**

**a) Mammalian Carnivores** - Stacie Hathaway discussed the track and scat results obtained to date by Kevin Crooks (graduate student, UC Santa Cruz) and her. Coyote, fox, bobcat, skunk, opossum, and raccoon are all present in at least some parts of TPSR. So far, there have been no confirmed sightings or tracks of mountain lions. Stacie and Kevin are currently determining the best procedures for using recently purchased infrared-beam-triggered cameras for night photography of mammals in the Reserve. One objective of the mammal project is studying the relationship between coyote and cat (feral and pet) populations in the Extension in order to understand what might happen to the small animal populations if the coyotes leave the Extension because of loss of access to Los Penasquitos Canyon.

**b) Reptile Survey** - Stacie left a copy of the current reptile report in the docent room. This covers the time from the beginning of the study in June 95 through last spring. Only 10 horned lizards were caught, with 8 being in the Extension, which is a dramatic change from the frequent sightings 20 to 30 years ago and shows why this is an endangered species. The California whipsnake (striped racer) was the most abundant snake species caught (22); only 4 southern Pacific rattlesnakes were caught.

**Acknowledgment** - My thanks to Mike, Stacie, and Jamie for discussing these projects with me.

**Notes From The Archives**

-Maryruth Cox

Many thanks to Maurie Brown, who has donated her valuable collection of pictures and papers about the park to the historical files. There are snapshots of docents at parties and at work; there are directions for making postcards (Maurie helped design the picture postcards that were sold in the lodge for many years); and more. Thank you, Maurie!

Good news from the jojoba front! In the April *Torreyana* we mentioned that a mysterious patch of shrubbery on the cliff near the bottom of the park road might be jojoba. In the 1950 issue of California Garden it was mentioned as a 'relic' stand, the westernmost stand of this plant which is usually found in arid inland hills. Recently Charles Kerns confirmed that this dense shrub, a mat of vegetation about 25' by 75', is indeed jojoba. It clings to the seaward slope of the cliff, above the picnic tables at the entrance to the park. Also, he found another clump of jojoba on the cliff above the German car garage, across the valley. It is not in the park, and it is uncertain whether it is native or was planted there. Charles Kerns found more jojoba on park land, on the slopes of the pad at the southeastern corner of Carmel Valley Road and Camino del Mar. If you start at the garage and walk west on Carmel Valley Road, you will see on the left a well-worn path that leads down to the railroad tracks. Follow it and you will pass by several small jojoba plants. Look to your right. Several large healthy jojobas are

growing on the slope. They have bloomed, and it looks like a good crop of goatnuts is coming. Now if they were only on private land, and we could pick the nuts, we could try eating them. They are said to be tasty, raw or roasted, and are eaten by animals and formerly by the Indians. According to Charlotte Bringle Clarke in her book, "Edible and Useful Plants of California," a rich drink is made in Mexico with roasted ground jojoba nuts mixed with egg yolk and then boiled with water, milk, sugar, and a vanilla bean or two. Sounds yummy!

Mr. and Mrs. Towhee  
 hop down the trail,  
 look for their breakfast  
 and sort through their mail ---  
 He collects some seeds,  
 and she rakes through debris;  
 they leave the path quite tidy  
 for you and for me.



**What Our Library Has**

-Marc Gittelsohn

To give you an idea of our library's current holdings, I have tabulated the number of items in each subject category in our 1996 collection. Our interests are suggested by the data: Plants & Habitats have the most, followed by Birds, Insects & Spiders, Torrey Pines, Earth Sciences, Indians, and Interpretation of Natural History. The statistics will unquestionably help in determining areas of future growth.

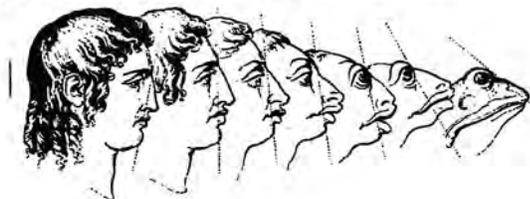
Animals & Animal Tracks	11
Birds	41
Deserts	7
Earth Sciences	25
Environment & Conservation	10
Fish	6
Gardens	9
Indians	25
Insects & Spiders	33
Interpretation of Nat. History	25
Mammals	23
Mushrooms & Fungi	4
Natural History (Science)	23
Oceans	16
Outdoors (Hiking, etc.)	5
Plants & Habitats	74
Reptiles & Amphibians	13
San Diego	8
Tidepools & seashells	18
Torrey Pines	27
Trees	16
Wetlands	7
Unassigned	15
<b>Total</b>	<b>441</b>

## Sharing What We Know (Subject List #15, Revised)

-Marc Gittelsohn

Here are most of the books on interpretation of natural history and parks now in the docent library. Of course, practically every work in the collection relates to the interpretive process; but, those listed are more specifically focused on teaching. Titles with an asterisk (\*) were added since this list first appeared in July 1992. All may be found in the INTERPRETATION section.

- Carson, Rachel, *The sense of wonder*. Harper and Row, 1965.
- Conradson, Diane R., *Parks*. Western Outdoor Environmental Guides, 1971.
- Cornell, Joseph B., *Sharing nature with children; a parents' and teachers' awareness guidebook*. Dawn Publications, 1979.
- Frome, Michael, *Whose woods these are; the story of the national forests*. Doubleday, 1962.
- Grater, Russell K., *The interpreter's handbook*. Southwest Parks & Monuments Association, 1976.
- \*Ham, Sam H., *Environmental interpretation; a practical guide for people with big ideas and small budgets*. North American Press, 1992.
- Hilker, Gordon, *The audience and you; practical dramatics for the park interpreter*. National Park Service, 1974.
- Krembein, William J. Jr., comp., *The interpreter's guide*. California State Dept. of Parks and Recreation, 1977.
- \*Lingelbach, Jenepher, ed., *Hands on nature; information and activities for exploring the environment with children*. Vermont Institute of Natural Science.
- \*Los Angeles [County] Dept. of Parks and Recreation, *Windows into the wild; a docent naturalist training program*. (no date)
- \*Machlis, Gary E., ed., *On interpretation; sociology for interpretation of natural and cultural history*. Revised edition, Oregon State University Press, 1992.
- O'Neill, Elizabeth Stone, *Mountain sage; the life story of Carl Sharsmith, Yosemite Ranger/naturalist*. Yosemite Association, 1988. One of America's great park interpreters.
- Tilden, Freeman, *Interpreting our heritage*. Revised edition, University of North Carolina Press, 1967.
- Tilden, Freeman, *The national parks: what they mean to you and me*. Knopf, 1965.
- \*Vessel, Matthew F., *Natural history of vacant lots*. University of California Press, California Natural History Guide no. 50, 1987.
- \*Veverka, John A., *Interpretive master planning for parks, historic sites, forests, zoos and related tourism sites*. Falcon Press, 1994.
- \*Wilkie, Richard J., *Environmental education teacher resource handbook; a practical guide for K-12*. Kraus, 1993.
- \*Wong, Herbert H., *The backyard detective; a guide for beginning naturalists*. Naturevision, 1993.



## School Field Trip Program

-Barbara Wallach

Schools have already started booking their 2nd-5th grade classes for our nature experience program for the 1996-1997 school year. Teachers have learned that they must make their reservations early in order to be assured of a date for our wonderful program. To those of you who work with the children, I hope you are having a relaxing summer, gaining strength, and picking up tidbits and ideas to use come September. The summer really does go by in a hurry, doesn't it?

During the summer, a group of us (Leo Baggerly, Myrna Burton, Ann Campbell, Jim Cassell, Don Grine, Twinx Hauer, JoAnn Miale, Joan Nimick, Mary Weir, and I) met to evaluate last year's program and to plan for this year. For the most part, it was felt that the program (with our four main themes: The Reserve; Plants and Habitats; Food Chains, Ecosystems, and Native Americans; and Whales) is very popular with the students and teachers. The theme on whales will be expanded to cover more subjects since we cannot guarantee whale sightings but may see dolphins, sea birds, seals, kelp, etc. Our opening presentation with the wonderful props we have will basically be the same; however, during the walks the docents will have more information to relay to the children on the subjects mentioned above. We will strive to hold our opening presentations to approximately fifteen minutes.

As before, the program will be available to schools on Wednesdays and Fridays. Since our program works best when we have at least two hours with the children, we will book the schools from 9:30 to 11:30 or 10:00 to 12:00. As always, our emphasis will be on learning while hiking in small, docent-led groups. We will continue our busing grants to those schools and children we have targeted for our program. The neediest!

If you haven't become involved with this program, as always, we invite you to join us. The schedule will be posted on the docent room closet door. Come along on a hike (as many times as you like) and if you decide to get involved, we'll give you a packet of wonderful little tidbits of information. Come anytime, don't wait for an invitation! We're always glad to have you share and enjoy the program. Since September and October are not usually heavily booked, we docents will be going together on hikes sharing with each other our little stories and the tales we tell about the plants, birds, animals, etc. There will be a tremendous variety of information (some even factual) to be gained from joining us on these hikes. Our first such hike will be on Friday, September 13th at 9:30a.m. Come on along!

Often the thank you letters we receive from the children are spontaneous. No time for grammar, spelling, etc., to be corrected. Phonetically reading them requires real concentration sometimes. Have fun and see how well you do with these words taken from the children's letters.

LIZZARD, LIZED, FREND, ANIMILS, STIKKY, SHOUD, VEW, PRABULEY, WUNDERFULL, DOLFINS, AGEN, VOLINTER, HOLS, LOGE, MUSUM, HERBA SANTA, SKANKE, GIDING, FERINDS, PRICIDALY PAIR, FAT MAN'S MISUARY, PLANTZ, WAT, GIYED, MUSIUN, NISEST, RELEY. I especially love this spelling for one of our docents, Rooth.

## Ranger Report

-Bob Wohl

The Docent Appreciation Party will be held this year on Thursday, September 5th at 6p.m. We're planning to have lots of good food and fun activities so please join us. On a less pleasant note, we've discovered evidence of bark beetle infestation on Nogales adjacent to the reserve Extension. We'll keep you posted. See you on the 5th!

## Junior Ranger Program

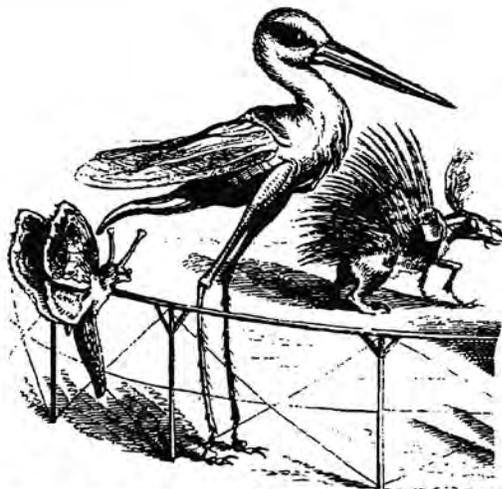
-Ranger Allyn Kaye

We are still looking for fun self-guided activities aimed at kids 7-12 years old. We have lots of sources of inspiration to assist you in your creative efforts. Each activity should be approximately two-three pages long and include fun facts as well as stimulating inquiry. Good examples of what we are trying to target are the kids "Mini Page" in the San Diego Union, 'Ranger Rick' magazine, Zoo Books and '1-2-3 Contact.' Talk to me or Melani (she's dropped the 'e' from her name) for more information.

### Answers to 'Know thy Docents...' from page 2

Del Mar Fair/Home Show: Margaret Bardwick demonstrated loom weaving and was on the booth committee for the design of the loom weaving display. Millicent Horger received a 3rd place ribbon for loom weaving for a prayer shawl for her granddaughter's bat mitzvah. Judy Schulman was awarded a 3rd place ribbon for her Torrey Pine Needle Basket Hat. Gem & Mineral Show: Joanne Meile won a 3rd place ribbon for her carved wedding band called 'Iguana Love'.

TPDS President Don Grine worked on explosives for 25 years.



Drawing by Grandville. *Un Autre Monde*

## Torrey Pines Docent Society Board

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*Torreyana* Editor

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Rangers

Resource Ecologist  
Park Aides

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e-mail: pdrechsel@opgl.ucsd.edu

(Please note that the figure after 'opg' is a 1 as in 'one'.)

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# SEPTEMBER DUTY CALENDAR

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 L Archer W D. Miller L Archer W Tanalski	2 LABOR DAY L Carson W Bressler L Cooper W Carson	3 L Campbell L Vale	4 L Musser L Oswalt	5 L Clark L Campbell DOCENT APPRECIATION DINNER	6 L Davis L Hansen	7 L Watson W Ferguson L Weir W Stiegler
8 L Stone W Cassell L Anasis W P. Roberts	9 L R. Miller L Rudolph	10 L Talberts L Amanns	11 L D. Miller L Shaw	12 NEW MOON L Clark L Oswalt	13 L Wollaeger L Gittelsohn	14 L Gaarder W Tanalski L — W Marley
15 L Heller W Ferguson L McConnell W P. Roberts	16 L Cooper L Shaw	17 L Wenman L Vale	18 L Musser L Hauer	19 L Katz L Gaarder	20 L Wenman L Nelles	21 L — W Brav L Watson W D. Miller
22 FALL EQUINOX L McConnell W Cassell L P. Roberts W Dixon	23 L Rudolph L Huber	24 L Talberts L Dixon	25 L Bressler L Davis	26 FULL MOON L Hansen L Hauer	27 L Wenman L Gittelsohn	28 L Weir W Brav L Archer W Tanalski
29 L Schulman W Marley L Schulman W Stiegler	30 L R. Miller L Katz					Duty Coordinator: Elaine Sacks, 551-0708 Hours: Lodge: Daily, 10am-1pm, 1-4pm Walks: Sat, Sun, & Holidays, 11am and 1 pm If you cannot do your duty, please arrange your own substitute.

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