



# Queensland News

*Rainforest Live*

November 24, 1997

Volume 2, Number 9

LINKING CLASSROOMS AROUND THE WORLD TO RESEARCH SITES AROUND THE WORLD

## Nitrogen Valuable Component of Daily Life...



**Herbie Duber**  
Pomona College  
November 11, 1997  
The Nitrogen Cycle

The nitrogen cycle is a complex biological cycle involving the recycling of usable nitrogen. If this cycle ceased to occur, all forms of life on the planet would die.

All life forms, including humans, use nitrogen in compounds called amino acids. These amino acids then act as building blocks for proteins.

Nitrogen, in fact, is the most abundant element in the atmosphere. Most organisms are unable to use this nitrogen from the atmosphere and rely on the nitrogen in the soil.

The cycle consists of three distinct parts: ammonification, nitrification, and assimilation. The first part of the cycle is ammonification. This process consists of the recycling

of nitrogen from waste back into a nitrogen compound called ammonia (or ammonium). The nitrogen that enters the soil comes from trees when they rot on the ground after dying, and from wastes excreted by animals. Bacteria in the soil use these nitrogen compounds to form their own proteins and release the nitrogen as ammonia.

The next step in the cycle is that of nitrification.

This involves a change in the oxidation state of nitrogen. In very basic terms, this involves the nitrogen in ammonia

(NH<sub>3</sub>) transforming into nitrate (NO<sub>3</sub><sup>-</sup>). Once the nitrogen is in the nitrate form, it can be assimilated back into the roots of the tree from the soil. This is the third and final step of the cycle. Once in the tree, the nitrogen can be transferred to



### QUOTABLE QUOTE

*“Growth is  
the  
only evidence  
of Life.”*

**John Henry Newman**  
*Apologia Pro Vita Sua (1864)*

animals by eating from the tree, or eating other animals that have eaten from the tree. When this tree grows old and dies, or when the animals release waste, the cycle can start all over again.

As you can clearly see, the nitrogen cycle is essential to existence of all life on earth. As well as playing a key role in the nitrogen cycle, some trees and bacteria also take place in something called nitrogen fixation. This refers to nitrogen from the atmosphere being brought down to the earth and incorporated into the nitrogen cycle. The rainforest is an extremely important resource because it plays an important role in the nitrogen cycle and contains many trees that are good nitrogen fixers—providing us with more of the nitrogen that is vital for life.

## EXTRA! EXTRA!

**11/12** Bird directed research group getting an early start (5:00 a.m.) in order to hear the birds' dawn chorus.

**11/13** Students from the Herberton School District coming out to CRS to meet the SFS students, get a tour of the site, plant seedlings, and eat chocolate chip cookies prepared by us. While visiting, the students sang a song, read a poem, and gave us little bookmarks they made just for us. Everyone had an excellent time!

**11/14** Trip to TREAT to help out with work on their shadehouse.

**11/15** Preparing site at CRS for planting. This requires a lot of hard work in hot and sweaty conditions.

**11/16** Will spend the day clearing weeds from a site where students will plant seedlings. Plant identification quiz today.

**Student Journals**



**Sarah Swedarsky**  
**Washington Univ.**  
**Rainforest Birthday**  
**November 16, 1997**

A few days ago I turned 22! I am the oldest student here, so I guess that means I'm the wisest. Although I missed my mom's homemade birthday cheesecake, it was the best birthday yet. In the morning a group of fourth graders came to the center to check it out. We all had a blast! Each of us paired up with a kid. I showed my partner around the place and then we all potted seedlings in our shade house. My partner and I potted 42 seedlings—we were speedy! After potting, we ate cookies and the school kids sang "Happy Birthday" to me. It was the best morning I have had in Australia.

In the afternoon we went on a field lecture with a man from the Department of Forestry. He showed us different strategies for growing trees. The last site we saw was pretty sad because the trees were being cleared right in front of us! I thought about the animals and trees which were losing their homes. However, the evening was happy because we celebrated my birthday with cheesecake (not my mom's but pretty good), timtams (the best cookies), ice cream, and presents. What more could a girl want?



**Daniel Tonkin**  
**Duke University**  
**November 16, 1997**  
**Kuranda Markets**

Since Sunday is our day off, we usually take the day to go on a field trip to a fun location. This past Sunday our field trip was to the town of Kuranda, an hour and a half north of the Center.

While visiting Kuranda most people took time to shop at a market and the many other shops throughout the town. The town attracts a lot of tourists looking for rainforest merchandise. Everyone here is looking for gifts to buy for friends and family at home, as well as for themselves, so we were able to buy a lot of gifts we needed. Some people bought didgeridoos—aboriginal musical instruments which are popular around here. It wasn't all about shopping though. Some people went and visited a butterfly sanctuary, where you could walk into an enclosure and watch swarms of colorful butterflies flutter around you.

On the way back from Kuranda, we stopped at a lookout over a waterfall that flows out to the ocean. The waterfall can get very big in the wet season, but it wasn't that big because it is dry season right now. At another lookout, we could see all the way out to the ocean. It was a beautiful, enjoyable day. If you are ever in Australia and need to buy some gifts, head on up to Kuranda. You won't be disappointed!



**Lisa Blair**  
**Univ. Pennsylvania**  
**November 16, 1997**  
**Joys of Weeding**

We did some hard manual labor today—and boy do I feel good! Sometimes I feel as if I am a laborer instead of a college student, but honestly, I love "getting my hands dirty" and working so close with my environment. For some strange reason, physical work elicits a feeling of euphoria in me and many other students participating in this program.

I yanked, pulled and tore, along with 31 other SFS students, my way through a weed infested 14,000 square meter area at the Center in order to prepare the land for future tree planting. Neither the heat nor the difficulty of the work could stop us! Extracting weed roots from the soil, cutting weeds with machetes and collecting the weeds into piles were just a few of the numerous activities that I helped out with that morning. It was nothing less than empowering.

By the end of the afternoon, I felt amazing! It is very rewarding to change an environment so drastically by everyone pitching in (even a small area). Because we worked as a team, the weeds were cleared in a matter of hours. It is amazing to think what a few "greenies" can accomplish in so little time.

As far as a career in land maintenance, I do not think it will happen but I did learn some important and valuable skills that I might use sometime in the future.



# Q&A

## Q. Do you have a dress code or have to dress a certain way?

*R. Henderson, Longview, TX, USA*

**A.** Although there are no uniforms or a dress code at Warrawee, there is a distinct style: dirty, comfortable clothes are definitely “in.” Since we usually spend most of our days in the field under the hot sun, we wear shorts and T-shirts.



There is great variety in the type of shorts and T-shirts, however. Some shorts are big and baggy and other shorts contain thou-

sands of pockets for many different treasures that are found in the field.

The types of shoes that are worn usually demonstrate the activities of the day. On a day with lectures and indoor activities, sandals are everywhere—the most popular choice is the Teva. On the other hand, when multiple hours are spent in the field, heavy and sturdy hiking boots are a requirement. The field has many hazards such as poisonous snakes and stinging trees, so boots provide the best protection.

Another hazard in the field is the sun. Queensland has one of the highest rates of skin cancer in the world. Therefore, hats, sunscreen, and sunglasses are very important. The hats range from baseball caps to cowboy hats, to the Australian outback hat or straw hats. Swim suits are also

important in the field because a swimming hole is usually found close by for cooling off after a hard work day.

The evenings are usually cooler than the day in the Tablelands due to the high elevation. We usually wear long sleeved shirts, flannels, sweaters, or fleeces to stay warm. Pants are also worn, especially the new trendy colorful knit type that were purchased over break. However, on a night out on the town, we usually get excited to change out of our dirty rugged field clothes into more stylish clothes. Colorful sarongs and sundresses are the attire of choice. As you can see, the style at Warrawee is not limited to just one type of clothing.

*Jonna Derbenwick*

## Q. Who is your inspiration?

*Rose R., Cambridge, MA, USA*

**A.** I guess there have been a lot of people who have inspired me and influenced the decisions I’ve made throughout my life. My family has certainly been inspirational by strengthening my individuality and encouraging me to question what is generally expected. This led me to think about how destructive many humans are toward the environment and how important it is for me to consider my own behavior.



Many environmental teachers and authors have inspired me by the special relationships they share with nature. I have learned the ecological importance of preserving the environment like maintaining biodiversity, air and water quality, and stabilizing the global climate. But I’ve also learned to

appreciate the environment for its natural beauty and serenity. I’ve grown to love camping and hiking and the mere presence of a natural environment surrounding me.

Because I have chosen to spend a lot of time outdoors, I have been inspired by the beauty and energy of nature itself. By appreciating all the unique forms of life and everything they have to offer, I have developed a connection with nature and a responsibility to protect it. Finding inspiration is an important step towards respecting the environment, but it is found in different people and places for everyone.

*Robin Cheney*

## Q. Has the humidity or rain effected any of your belongings?

*Mike F., Oklahoma, USA*

**A.** I personally have not had many problems with the humidity here in the rainforest. It is currently



dry season and has not rained a lot, but it does tend to stay pretty humid. The times I notice it the most are when I go jogging through the

rainforest. It is also noticeable when the sun is not out, and my clothes are on the clothesline trying to dry. Another minor problem is that sometimes the glue on my envelopes gets moist and presses together, so they seal up before I put anything in them. Sometimes after it has rained, our cabins are very humid and everyone’s sleeping bag and sheets get a little damp. However, it is not too uncomfortable. Since it is pretty dry here now, the humidity has not been a problem for me.

*Jeremy Clark*

**Faculty Essay - Victoria's Rifle Bird****Natasha Litchfield, Intern****November 18, 1997**

*For the past two months I have been working on a project with John Grant, the ecologist-lecturer at SFS. We have been trying to determine the territory range of Victoria's rifle bird.*

*The rifle bird is a fascinating bird to study. Male rifle birds have spectacular deep velvety black feathers, above and below their body with a deep purple sheen. Their throat, crown, and central tail are an iridescent blue green. Female and immature Victoria's rifle birds are less attractive. They have dark olive brown feathers with cinnamon colored under parts. Both females and males have long curved beaks, females having longer beaks than males, which are used to feed on rainforest fruit and insects. In order to attract the female bird the male rifle bird has amazing display techniques. Quite often it will perch on top of a dead tree to perform a series of courtship displays. With wings outstretched to a horizontal position the male bird sweeps his wings forward, and at the same time brings his head back leaving his bill widely open, exposing his beautiful body plumes. When he is not performing he often sits on top of a perch and makes loud single "Yaaa" noises.*

*Studying Victoria's rifle bird has involved many early mornings. This past week I have been up at 6:00 a.m. every morning, following them around the rainforest. They usually call every few minutes, so it doesn't take long to find one. Sunday morning I heard a male bird calling at the creek on our property. To follow his call, I crossed the creek about three times and in the process lost total sense of direction. I eventually came out on the Gillies Highway, thankfully only a kilometer from the Center. It was quite an adventure. Unfortunately, rifle birds are almost at the end of their breeding season so we may only have another week or so to complete our study. Hopefully, this should be sufficient time to gather some interesting information about their territories.*



1. Why is it important for the students to wear boots in the field?
2. What is essential to the existence of all life on earth?
3. Who is your inspiration? Explain.

**Home Connection: Make your very own terrarium!**

**Materials:** newspaper, 1 large clear glass bottle or jar with a wide mouth, a few small green plants that will grow slowly (i.e. ivy, moss), small pebbles, stiff piece of paper, potting soil

**Directions:** (1.) Spread newspaper to create a work area. (2.) Wash jar with detergent, rinse and dry. (3.) Rinse pebbles and place on the bottom of the jar creating a 1 inch layer. (4.) Make a funnel with the stiff paper and place in the top of the jar. (5.) Pour the potting soil into the jar until there is a 2 inch layer at the bottom. Try to keep the sides of your jar from getting dirty! (6.) Think about how you would like to arrange the plants before planting. Remember to leave enough space for your plants to grow! When you have decided on an arrangement you are ready to plant. (7.) Make holes in the soil for the plants. Place the plants in the holes and pat the soil around the base of each plant. (8.) Water the garden so it is moist but not soaked. Place the lid on the jar. When the lid is on the jar you will only need to water your plants about every 4 weeks, only if the soil seems dry. If the glass fogs up, there is too much water in your jar. Simply remove the lid for a few days to let the soil dry out. Place your jar where it will receive indirect sunlight! Now you are ready to watch the plants in your terrarium grow!

**Site's Log****11/19/97**

**TIME:** 9:30 a.m. AEST  
(Australian Eastern Standard Time)

**AIR TEMP:** 25° C

**RAINFALL:** 0 mm

**WX:** Sunny and hot!

**KEY:**

°C=degrees Celsius

mm=millimeter

1. The field has many hazards such as poisonous snakes and stinging trees, and boots provide great protection.
2. The nitrogen cycle.
3. Answers will vary.

**Answers to Quiz**

Nov. 24, 1997  
Volume 2, No. 9  
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**Send us your questions!**

**phone** (800) 890-3049 or 617/357-0055  
**e-mail** rain@sitalive.com  
**WWW** www.sitalive.com  
**fax** 617/357 - 0056  
**mail** Ocean Challenge, Inc.  
20 Park Plaza, Suite 424  
Boston, MA 02116