

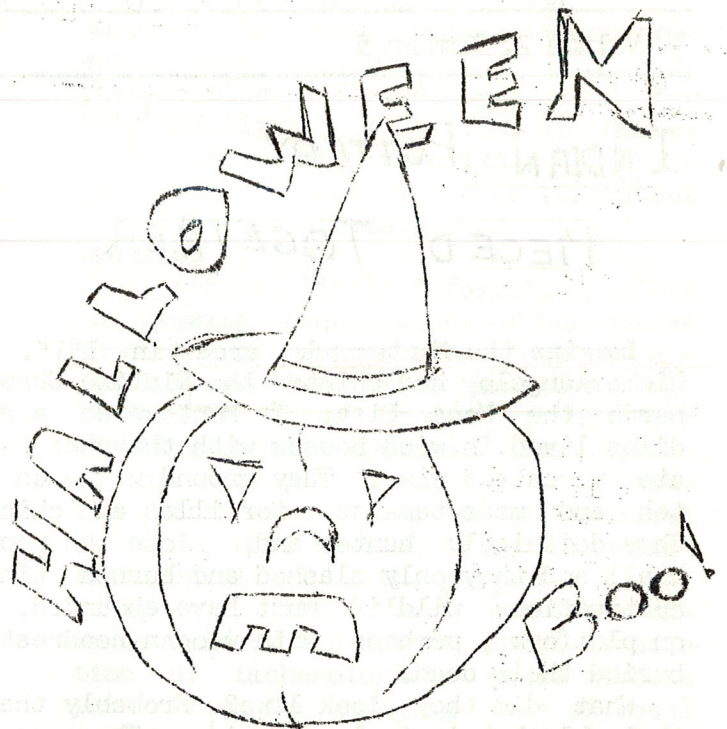
Biology By The Month

by Suzanne Koptur

Living in Monteverde, where dairy cows and vegetable gardens are important parts of our lives, it might be easy to get the idea that humans are the only organisms clever enough to grow their own food. Not so! The ant world, too, has its farmers. The activities of these and agrarians are very similar to the farming activities of humans, as we will see.

Many kinds of ants tend "livestock." Plant-sucking insects (mostly Homoptera, such as aphids, plant lice, tree hoppers and scale insects) excrete liquids (called honeydew) which are enthusiastically imbibed by ants. The sedentary and gregarious habits of these sucking insects allow the ants to reap a large amount of food without moving very far; ants may establish nests in the vicinity of the aphid herds, or even keep the aphids inside their nests in special "barns." Many ants stroke aphids with their antennae, an action which causes the aphid to secrete its drop of honeydew. It's not only the ants that benefit, however—the aphids are protected from predators (e.g. lacewing larvae, or "aphid-lions") and parasites (wasps and flies which lay their eggs in the aphids) by the presence of the ants. Caterpillars of hairstreak butterflies (Lycaenids) eat foliage, and subsequently excrete "honeydew;" they, too, are tended and protected by ants.

The most methodical farmers by far are the leaf-cutting ants (*Atta* species). You've probably seen these ants carrying off, bit by bit, all the leaves of your favorite orange tree—or perhaps you've seen even a miniature rose parade as the ants cut and carry away flower petals and buds. What do



Would you like to be a tomato or Queen Elizabeth or scare everyone as a ghost or a witch? It's time to start thinking up a costume for Halloween. Dancing and refreshments are part of the current plans for ~~Friday, November 2.~~

Sat., Oct. 27.

they do with their loot? Many people think they carry off these succulent morsels to their nests to feast on flower and leaf bits. However, they are much more sophisticated than that: they carry the leaves and flowers to special chambers in the nests to use them as a substrate upon which they grow fungus. It is the fungus itself which produces food for both the leaf-cutter larvae and adults, in the form of bromatia, or food bodies, which consist of yeast-like cells (Bien nutritivo!). The ants even fertilize the fungus with liquid fecal drops (not unlike putting chicken manure on your garden or pastures). Next time you see leaf-cutter ants in your kitchen compost, notice which items they choose for fungus culture.

So you see there are many more farms in Monteverde than you thought!

MOUNTAIN MONTHLY

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INDIAN POTTERY

PIECED TOGETHER

Imagine the Monteverde area in 1515. In Europe Michaelangelo had painted the Sistine Chapel and Leonardo the Mona Lisa. In Monteverde a group of indians lived in wood houses with thatched roofs. They ate yucca and yams. They ground maize on stone metates and made tamales, tortillas and chicha alcohol. They definitely hunted and, since the population was small and they only slashed and burned tiny areas for cultivation, wildlife must have abounded. They slept on platforms, perhaps with wooden headrests, and they buried their dead.

What did they look like? Probably the women wore their black hair in long braids. The men, like indians then in Nicoya, may have shaved their heads leaving a fringe at the back. Clothing was likely simple cloths covering the loins, anything else for protection rather than modesty. Fibers of agave and Hibiscus species provided the material. They may have tattooed their skin with marks indicating to which chieftain they belonged.

We know they were here because in turning over fields, or digging foundations, shards of pottery have appeared. A triangle of land bounded by Wolf's barn, the Hollander's house and Campbell's lower pastures is particularly rich in finds. John is presently putting together, rather like a jigsaw puzzle, a recently discovered olla, a huge cooking or storage vessel, turned over on his land. He has tentatively identified the clay which contains small white specks as similar to that found near the new, but unfinished road to San Luis. He and Doris have a collection of smaller pieces from this area and the San Luis valley.

Who the indians were is a problem. They may have been Corobici who were
(Continued on page 4)

Auction

Coming

Soon

A small auction of the Millett's household items and fence posts among other things will be held on Nov. 15 at 10 am at the school. If you have anything worthy of an auction, donations would be appreciated. The funds collected will be used by the school committee.

Come and enjoy the fun including coffee and donuts.

LOCAL GROUP

DIGS TREES

An experimental program for conservation of rare and valuable native hardwoods was initiated on October 9 in Monteverde by John Trostle, Wolf and Carlos Guindon and Bill Haber. The plan calls for locating seedlings of about ten selected tree species for transplanting to experimental plots for cultivation. After 1 to 1 1/2 years the plants will be available to local residents for transplanting to their farms. When the plants reach the sapling stage, necessary information on light and moisture requirements for each species should be known. The species chosen include Tempisque, Irra Rosa, Quizarrá Colorado, Racino, Laillo, and Llurón.

This is a seminal program and one of the first of its type known in Central
(Continued on page 4)

THE GATHERING OF THE COMET FOLK

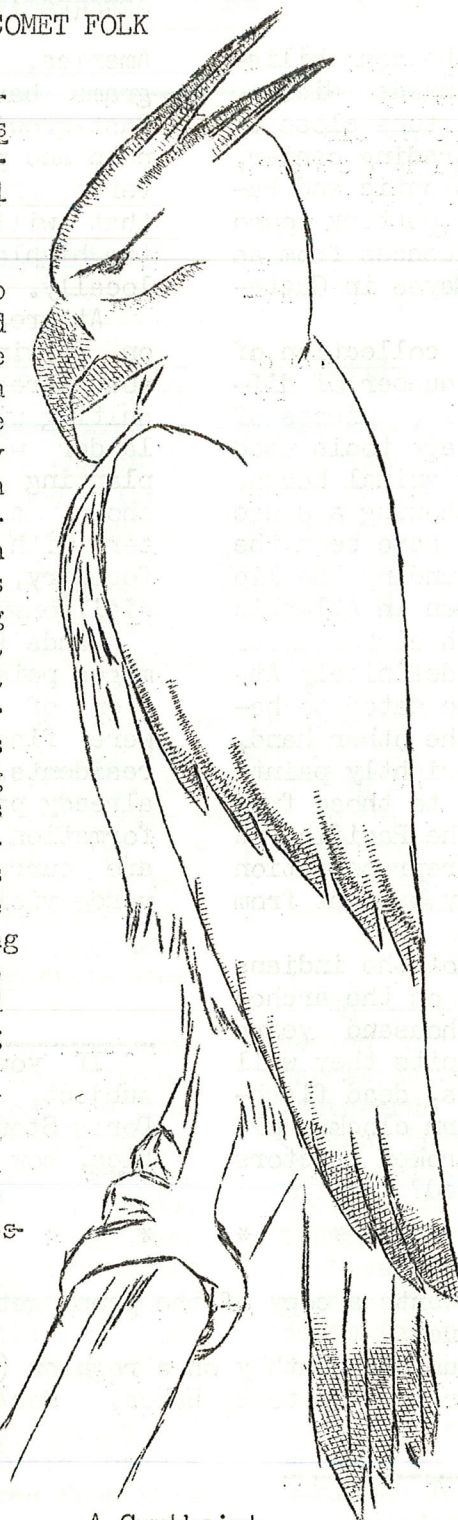
[After reading Lloyd Alexander's The Prydain Chronicles Carl Rees was inspired to continue the adventures. We will be printing excerpts from them.]

As the small group made up of Gurgi, Taran, Eilonwy, and Kaw made their way toward the Free Comets, they had no idea of the adventures that life had prepared for them. They had gone but a little way when they saw Gwythaints, birds under the spell of the enemy, in the sky. Their massive bodies just about completely blotting out the sun, one Gwythaint veered and went straight towards Kaw while the other two kept to their courses. As quick as a flash of lightening Taran knocked an arrow to his bow and shot. He hit the Gwythaint in the left wing and, as the arrow shaft broke off, the bird gave an earsplitting scream and slowly descended to earth. Taran left the bird well alone for fear of getting bitten by the sharp beak.

They continued without any more exciting events til dusk. The group camped in a small valley. They did not dare make a fire for fear that the hunters of Arawn might see it.

Sometime in the middle of the night Eilonwy awoke. She was not sure what had awakened her but she felt like someone else was present. She lit her bobble and perceived Achren sleeping under a bush a few feet away. Quietly she walked over and touched Achren, the powerless witch, but Achren did not awaken.

(TO BE CONTINUED)



A Gwythaint

Babies Born

On Monday, July 2 Anthony Martin Rockwell was born to Flory and Marvin Rockwell. His weight at birth was $4 \frac{3}{4}$ lb. and he was 48 cm in length. His eyes are dark brown and he has brown hair.

On Saturday, Sept. 29, a baby boy was born to Len and Olivia Hoge. He made his appearance at 1 pm with Sylvia Smith attending. His length was 22 in. and he weighed 8 lb.

Carson Luis Hoge has a crop of brown hair and blue-grey eyes.

Weather

Rain totaling the average height of a 10 year old child, 53.55 in., fell in the months of July to September. July's total was 10.75 in. (273 mm), an inch over the average. In August 15.16 in. (385 mm) fell, $4 \frac{1}{2}$ in. more than the average. And in September 27.64 in. (702 mm) fell, also over the average by $11 \frac{1}{2}$ in., and just short of the 1971 record of 28.54 inches.

Temperatures at Campbell's ranged from 59° F. to 72° F. We predict rain and clouds and more rain.

INDIANS, from page 1

pushed into the hills by the cannabilistic Choretega Indians who invaded Nicoya. But also nearby is La Fortuna close to Arenal, which was a major trading center, situated midway between Atlantic and Pacific Indian cultures. The pottery found there shows stylistic influences from as far north, also, as the Mayas in Guatemala and Mexico.

In Doris and John's collection of pieces are examples from a number of different cultures. For example, pieces of chipped rock may be stone age tools used to clean hides. Small clay animal heads, vultures, guatusas, etc., showing a sense of humor, originally may have been the appliqued decorations surrounding the lip of a cooking vessel as seen in Atlantic diggings. Hollow feet with clay pellets inside for large pots are definitely Atlantic ware and can even be dated to between 400 and 850 A.D. On the other hand, shards from San Luis of a brightly painted pot are very similar to those from the Panama Beach area on the Pacific. A jade pendant, a simplified representation of the axe-god, was probably brought from as far as Guatemala.

We can't say much more of the indians in this area, but speculate on the archeological discoveries a thousand years from now. In our garbage pits they will uncover cracked plastic cups, dead flashlight batteries, broken alarm clocks, old aluminum pots and bits of broken tractors. How will they decide we lived?

* * * * *

So that everyone who wants a copy of the paper gets one, our new distribution policy begins with this issue.

If you would like the Mountain Monthly on a regular (mas o menos) monthly basis, fill in the form below and return it to B. Haber. Cos is \$ 1 per copy.

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REFORESTATION, from page 1

America. To date, reforestation programs have concentrated on imported, fast-growing softwoods earmarked for pulp and plywood production. The Monteverde group hopes to build a data base that will become valuable throughout the highlands of Costa Rica, as well as locally.

At present little information exists on growing requirements of our native wood trees; however, the group is consulting with Paul Smith and Howard Hollander who have some experience with planting native species. Gary Hartshorn, a tropical ecologist and forester with wide experience in tropical forestry, will also serve as an unofficial consultant on the project.

Funds for the program come from damages paid by the International Association of Lichenologists whose members were fined for damaging trees of local residents. Part of these funds have already paid for production of the "Information for Visitors" pamphlets that are currently given free to all Monteverde visitors and tourists.

If you'd like to look further in the subject, much material was gained from Doris Stone's Pre-Columbian Man in Costa Rica, now in the library.