ence of these shorter routes is sug-
ggested by archaeological finds in
each of these areas. Similarly, older
routes that encompassed the western
Mediterranean as well as the Aegean
were also in operation during the
Late Bronze Age. The existence of
such routes is documented by Cyproit and Mycenaean pottery
found together at sites as far away as
Italy, Sicily, and Sardinia.
The large numbers of Late Bronze
Age Oriental artifacts found through-
out the Aegean area suggest that
voyages between the East and the
Aegean must have been common
during the 16th to the 11th centuries
B.C. Most were mundane, commer-
cial voyages, although a few may
have been official embassies and
diplomatic missions. It is again likely
that even the commercial voyagers
were "directional," favoring specific
sites and destinations.
If we look closely at the distribu-
tion pattern of Oriental found in the
Late Bronze Age Aegean, we see
that only at the major Mycenaean and
Minoan centers—Mycene and Tiryrs
on the Greek mainland, Knossos, Kommos, and Kato Zakro
on Crete, and Ialysos on Rhodes—are
extensive quantities of Oriental
found. The distribution pattern sug-
gests that these major centers initial-
ly received the Eastern goods, and
subsequently distributed some to the
surrounding villages and smaller
communities.
Furthermore, we can see some
interesting distinctions in distribu-
tion patterns. Our data show a re-
markable degree of differentiation
between the Oriental found at
Mycene and that found at nearby
Tiryrs, only three kilometers away.
At Mycene and its surrounding ter-
rity, we have a reasonably large
number of Egyptian objects but very
few Cyproit objects, whereas at
Tiryrs and its environs, Cyproit
import s are fairly common while
Egyptian imports are virtually un-
known. Such distribution patterns
indicate not only directional trade,
but also suggest that there may have
been cooperative and social relationships between
specific Aegean sites and individual
Eastern areas.
Conclusions
Like the Walrus and the Carpen-
ter, we have spoken of many
shoes, a few ships, and some
sealing wax; no cabbages but a few
kings. As we draw our map of the
trade routes and political relations
between the Aegean and the East during the
Late Bronze Age, we do
so with the knowledge that the map
will be redrawn and refined many
times in the future as new archae-
ological evidence comes to light and
more clearly illuminates those distant
times. We may never know for cer-
tain the precise details of those re-
mote voyages of commerce and dis-
coveries or the political events which
perturbed great nations and little
states. But this we do know. The
Late Bronze Age physical artifacts,
along with the textual references, the
statues, the inscriptions, and the wall
paintings, indicate that the Aegean,
Egypt, and the Near East, indicate
that we must envision strong com-
mercial and cultural interactions be-
tween the Mycenaen and Minoans
and the Cypriots, Assyrians, and Egyptians.
Such exchanges occurred over a
period of at least 500 years,
throughout the latter half of the
Second Millennium B.C. These interactions were not static but fluctuated
with time and with the rise and fall of
empires and kingdoms. The peoples
and their cultures have persisted,
and the arts and crafts and emblems of
distant era are now writ fair in
the sands of time, but the Oriental art-
ifacts that the Aegean and the Aegean
pottery in the East remain as
intriguing tangible clues to what was
once a lively commerce.

Bibliography
Astour, M.C. 1964. "Greek Names in the
Semantic World and Sargonic
Names in the Greek World." Journal of
1973. "Ligtari and the Aegean." In
Cretan and Oriental, ed. H.A.
Nineteenth Century History, 4.
Berek and Reveda Keveler.
Reveals Splendors of the Bronze
Age." National Geographic
172(26):689-724.
Chadwick, J. 1980. The Women of Pyle." In
Tales, Trojans and Sirens, ed.
J.F. Oliver and T.G. Palaima.
pp. 43-50. Salamanca: Ediciones
Universidad de Salamanca.
Armenian: A Revision of
Egypto-Aegyptian Relations in the
18th Century B.C." Orienteers
50(1-3):54-57.
Aeschylus III Plaque Archive
from Mycena." Journal of the
American Oriental Society
80:205-207.
1961. "Orientalis in the Late
Bronze Age Aegean. A Catalogue
of Analysis of Trade and
Contact between the Aegean
Area, Anatolia, and the Near
East." Ph.D. Dissertation,
University of Pennsylvania. Ann
Arbor, MI: University of
Microfilms.
1981. "A Possible Hittite
Exchange against the
1981. "Trripte Objects in the
Bronze Age Aegean. Amsterdam
Studies 41:1-61.
Davies, N. de G. 1943. The Tomb of
Rekhmire at Thebes. New York:
The Metropolitan Museum of
Art Egyptian Expedition.
As a result, today the ranch contains a wide diversity of birds, mammals, and reptiles. Ornithologists have recorded over 340 species of birds there, ranging from familiar migrants from North America, such as the barn swallow, to the brilliant scarlet macaw, seen everywhere in pairs and sometimes in flocks of 15 or more (Fig. 2). A full spectrum of cats can be found in and near the forests, from jaguars and pumas down to ocelots and jaguarundi. Their mammalian prey includes capybaras, the world's largest rodent, found in large groups either in or near water; both giant and lesser anteaters; and the ubiquitous white-tailed deer. In the rivers and streams that criss-cross and border the ranch are river dolphins, the large Orinoco crocodiles, anacondas, and a robust population of caimans, small alligators that grow as much as six feet long.

While a strong interest in conservation is a necessary precondition for a successful program, it is not sufficient in itself. Antonio Julio Branger has been able to preserve Hato Piñero's natural patrimony by pursuing several approaches simultaneously. First, protecting the ranch's wildlife would have been impossible without a productive economic base, and he has managed the cattle production of the ranch in a way that is both efficient and ecologically sound. Mr. Branger introduced and raised purebred zebu cattle from India, Brazil, and elsewhere. Over the years he has stayed current with advances in technology, so that today, for example, all breeding of the prize-winning cattle is done via artificial insemination.

The Brangers also pioneered the importation of a highly nutritious species of African grass, planting it in large paddocks in the central part of the ranch (Fig. 3). This made it possible to move cattle in from the far reaches of the ranch and to use smaller centralized areas more intensively. Because less money was needed for fencing, road maintenance, and transport, significantly more cattle could be supported at a significantly lower cost. More important, from a conservation point of view, cattle were withdrawn from the outlying areas, allowing the native wildlife to thrive without competition. In addition, small companies were set up to market the nutritious grass seed and to sell frozen semen from Piñero's prize-winning bulls. In short, a strong economic base was maintained that made it possible to continue and even improve the traditional way of life of the local people without sacrificing conservation objectives.

A second major approach toward conservation, in which the wildlife in effect has contributed to the cost of its own protection, began four years ago. At the urging of ornithologists from around the world who were familiar with the unusually large and diverse bird populations of the ranch, Mr. Branger decided to construct a tourist facility to house and feed 22 visitors. Using local artisans and materials that included concrete and tree trunks from nearby forests, a simple but comfortable structure was constructed that blends imperceptibly with the ranch buildings that surround it. Open trucks whose sheet-metal bodies were specially constructed in the ranch's own workshops now carry visitors to representative habitats, where the wildlife that surrounds them is pointed out and described by expert bilingual guides. Because the tourist operation has been successful and often operates at or near capacity, some visitors have suggested that it be expanded and a swimming pool and other luxuries be added. Mr. Branger, however, is well aware that success in what is now called "ecotourism" can overwhelm the fragile environment that has attracted visitors to the llanos as a way of providing financial support for the preservation of Hato Piñero.

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Figure 2. Six pairs of scarlet macaws, rarely seen in such numbers elsewhere, perching in a tree. The unusual abundance of birdlife at the ranch has drawn ornithologists and birdwatchers from all over the world.

Figure 3. Grassland in a paddock used for cattle grazing at the height of the dry season, with the hills of Pre-Cambrian rock that mark the northern boundary of Hato Piñero in the background.

Figure 4. A family group of capybaras, grazing rodents that spend much of their day in water. These animals are traditional sources of meat in the llanos, and the possibility of limited sustainable harvesting is under study at Hato Piñero.

Figure 5. A young adult male capuchin contemplates descending to the ground. Dry season conditions unfortunately cause these monkeys to expand their range in search of food, making it harder for observers to find them.
a Research Center with facilities for up to 18 scientists (Figs. 7, 8), a herbarium, a library, office space, and both wet and dry laboratories. The same team that built the tourist building four years ago has been reassembled, and similar techniques and materials have produced a structure whose alternating hues of natural wood, terracotta colored plaster, and red roof tiles blend unobtrusively with the surrounding red soils. To better manage this burgeoning scientific effort, the Fundacion Branger has been created; its role is to establish research priorities for Hato Pífero, seek funds to support research, and coordinate the efforts of all visiting scientists. The Research Center will have both a resident biologist and a full-time director.

Conservation is no longer simply a matter of setting aside a tract of land and protecting it and the animal and plant species it contains from human incursion. Experience has shown that conservation objectives must be tightly linked with the economic interests of the people most directly concerned with the land if a project is to succeed. In addition, particularly at times when money is scarce, conservation projects should be as close to self-supporting as possible. The Branger family’s stewardship of Hato Pífero hews close to these guidelines and provides a unique example of a landscape that is being preserved through a combination of careful and efficient development, the controlled introduction of ecotourism, rational sustained exploitation of non-threatened species, and the encouragement of scientific studies whose results will feed back to improve management of the land.

Robert S.O. Harding

Figure 8. Concrete, packed earth, and clay tiles are used for the walls and roof of the Research Center, which can house as many as 18 scientists studying the wildlife and ecology of Hato Pífero.

The project is also being studied to increase artificially populations of a small parrotlet found in large flocks in many parts of Hato Pífero. A limited number of fledgeings would be collected annually for sale to the pet trade, in hopes of diverting some of the demand that now threatens the related but rarer parrots and macaws. Rational sustained exploitation of non-threatened species, Sr. Branger believes, is both compatible with and contributes to a conservationist approach.

Because of his deep commitment to Hato Pífero, its land and its wildlife, Sr. Branger has also strongly encouraged scientists to come there to study the wildlife. Venezuelan scientists have studied the hoatzin, a unique and primitive bird recently found to be the only living bird with a ruminant (cow-like) digestive system. Others have studied the feeding ecology of pecarries, the dynamics of birdsong, caimana communication, and frog egg masses as indicators of air pollution by heavy metals. Currently in process is a study of the red howler monkey that blends population genetics and behavioral observations to learn about the role played by cooperation among males in achieving reproductive success. In the deciduous forests found at intervals throughout the area, a long-term study of the behavior and ecology of wedge-capped capuchin monkeys has been under way since the fall of 1988. Sponsored by the University of Pennsylvania, a series of students have concentrated initially on documenting the composition of the monkey home forest and recording the details of their feeding ecology.

Although a network of trails covering over 250 hectares has been cut through the forest, the monkeys are divided into groups that make use of this area (between 9 and 12 groups, ranging in size from 17 to over 40 individuals) fairly evenly. These groups are generally found to range beyond the trail network (Fig. 5). Because the forest floor is flooded during the rainy season and the undergrowth can be extremely dense, it is often impossible for an observer to keep up with a group of monkeys that insists on moving rapidly through the treetops outside the trail network. As a result, researchers have begun to affix lightweight radiocollars to certain animals to aid in locating their groups when they have moved beyond the trail system (Fig. 6).

Although there are interesting ecological questions still to be pursued, once it is possible to locate and observe regularly the same group, the focus of research will switch to behavior. Capuchin monkeys are generally regarded as highly intelligent animals, and certainly their interactions with humans in captivity, where they have served as everything from organ-grinders’ monkeys to therapeutic animals, reinforce this perception. Close behavioral observations should shed some much-needed light on the origin, nature, and adaptive value of their cognitive abilities. Viewed in a larger context, what the capuchin project is learning about the deciduous forest and its inhabitants will be useful to researchers studying other forest species; and, as is the case with all scientific studies at Hato Pífero, its results will contribute to the conservation mission of the ranch.

As the number of scientific visitors has grown, Sr. Branger has responded by beginning the construction of

Figure 5. Beams heaved by hand from the trunks of trees from nearby forests form the framework for the new Research Center.

Figure 6. Lynne Miller, a graduate student in anthropology at the University of California, Davis, uses a portable antenna and receiver to locate a red-faced capped capuchin monkey.