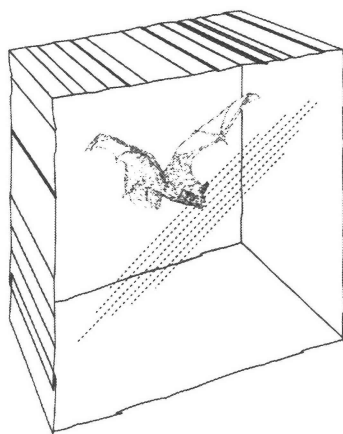


CONTRIBUTIONS FROM  
THE MUSEUM OF JURASSIC TECHNOLOGY

BERNARD MASTON,  
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of the TRIPSICUM PLATEAU



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THE MUSEUM OF JURASSIC TECHNOLOGY - LOS ANGELES

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BERNARD MASTON,  
DONALD R. GRIFFITH,  
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of the TRIPSICUM PLATEAU

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BY  
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## INTRODUCTION

The material for this leaflet is derived from an exhibit bearing the name *Bernard Maston, Donald R. Griffith and the Deprong Mori of the Tripsicum Plateau* housed at The Museum of Jurassic Technology in Los Angeles, California. This exhibit documents the remarkable history of the scientific discovery of an equally remarkable creature—the *Myotis lucifugus*. The history of this discovery spans two centuries, involves what was for many years a highly controversial hypothesis, and intertwines the research of two very different scientists: Bernard Maston, a late nineteenth century anthropologist, and Donald R. Griffith, an eminent mid-twentieth century chiropterologist. The juxtaposition of the work of these two men demonstrates in bold relief how, over the last century, progress made in the application of the scientific method, as well as developments in scientific technologies, have led to the triumphs of modern scientific inquiry.



Bernard Maston, Donald R. Griffith,  
and the Deprong Mori of the Tripsicum Plateau

**Bernard Maston**

On his return in 1872 from anthropological field work with the Dozo of the Tripsicum Plateau of the Circum-Caribbean region of Northern South America, Bernard Maston reported having heard several accounts of the Deprong Mori, or "Piercing Devil", which Maston described as "a small demon, which the local savages believe able to penetrate solid objects."

Although only mentioned in passing in his ethnology of the Dozo, Maston recorded in his field notes numerous accounts of the Deprong Mori. A typical report would describe a Piercing Devil entering a local savage's dwelling by flying through one of the thatched walls, proceeding across the living quarters, and exiting through the opposing thatched wall (1.1). Maston attributed this unusual capability of the Deprong Mori to, in his words, "the insubstantial nature of the savages' crude dwellings." Most of Maston's accounts talked of solitary Mori; however, one incident reported six Mori flying in rapid succession, as if in formation, through a domicile measuring eleven by thirteen feet, during the inhabitants' evening meal.

Yet another perplexing report was mentioned without comment in Maston's field notes. "A Mori is said to have penetrated the outstretched left arm of a five year old child. The arm apparently evidenced no lesions



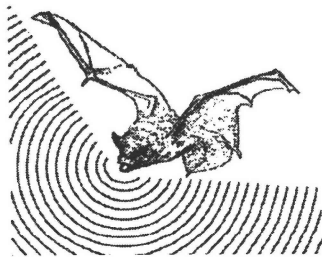
1.1 Dozo dwelling

or wounds of any kind; however, the arm became numb and immobile for a period of three days. The natives reported that this event gave the child's left hand the ability to heal warts, blood blisters, and other superficial skin disorders."

Maston died unexpectedly in 1874 during an influenza epidemic and with him died the civilized world's only link to the Deprong Mori.

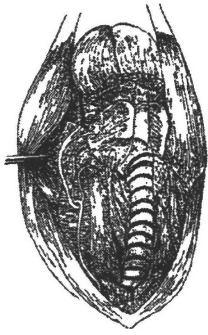
### Donald R. Griffith

In 1952, however, modern scientific research turned its keen eye on the "Deprong Mori" phenomenon. In that year, Donald R. Griffith of Rockefeller University and author of *Listening in the Dark: Echolocation in Bats and Men*, by chance read Maston's field reports and was struck with what Griffith later described as having "smelled a bat" in Maston's early field work. Armed with only the smell of



1.2 Bat's sonic beam echolocation emission





1.3 Larynx of the *Myotis lucifugus*

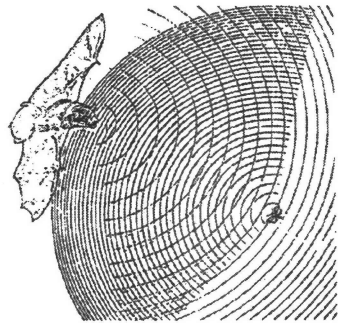
a bat and a Norris Foundation grant, Griffith and two research assistants traveled to the Tripsicum region to do further research on the Deprong Mori.

Griffith and his assistants spent an intensive eight-month period researching the Deprong Mori as best they could under difficult circumstances. Their research was limited by terrain and the scarcity of the creature. Nonetheless, by the end of the eight months, through careful observation and a fortuitous sighting of a Deprong Mori flying directly through the heart of a Banyan tree, Griffith had determined that the Deprong Mori of the Dozo was, in fact, a tiny white bat of the species *Myotis lucifugus* which, although previously documented, had never before been studied in detail.

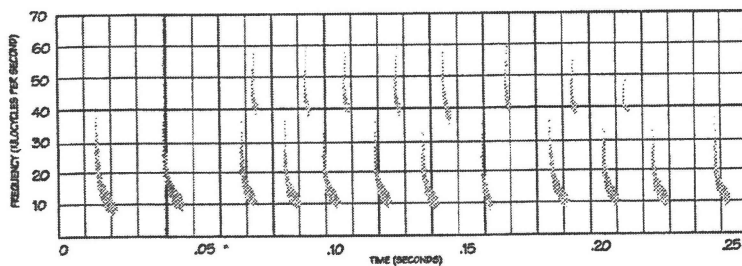
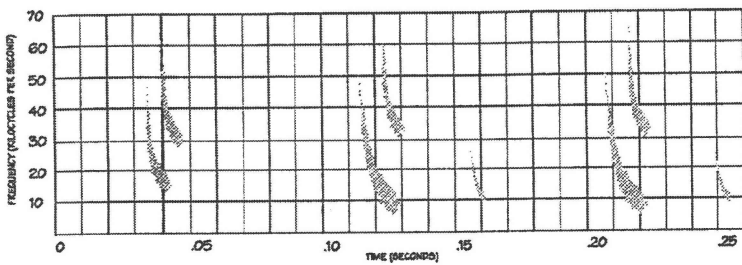
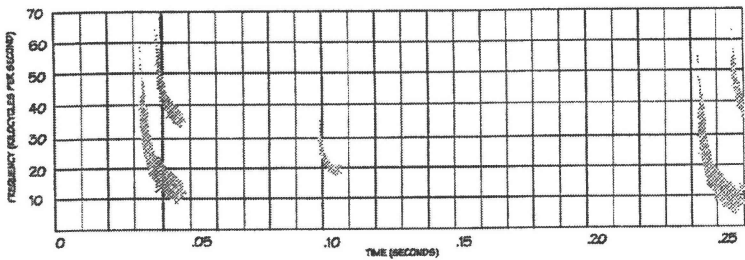
### Echolocation

Most species of bats have well-developed, frequency-modulated “radar” echolocation systems (1.2). The key element in such an echolocation system is a sonic beam (actually a high-pitched clicking sound), which the bat emits and sweeps back and forth to scan its surroundings (1.4). The beam is then reflected back from objects to its extremely sensitive ears, thereby giving the bat a continually updated “radar” image of its surroundings.

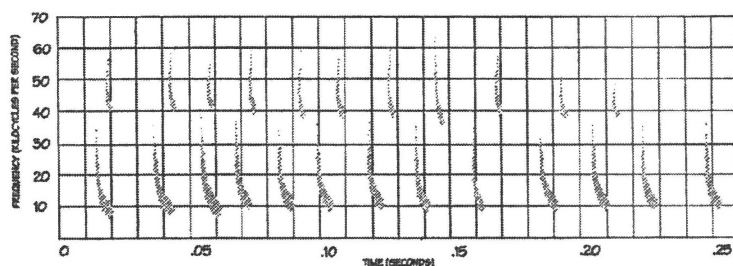
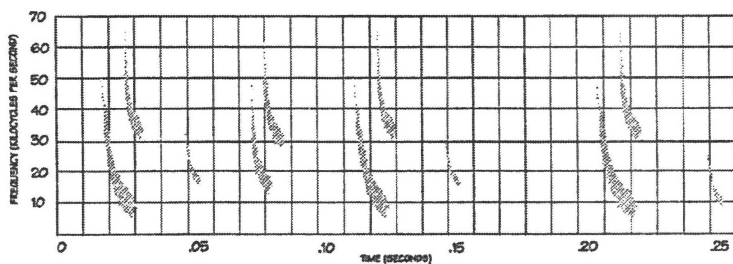
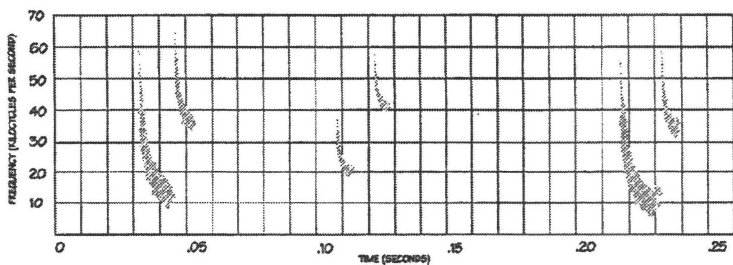
Griffith, at the end of the eight month study, put forth what at the time was a rather startling hypothesis reconciling the Dozo’s piercing devil with modern scientific knowledge of the dynamics of echolocation systems.



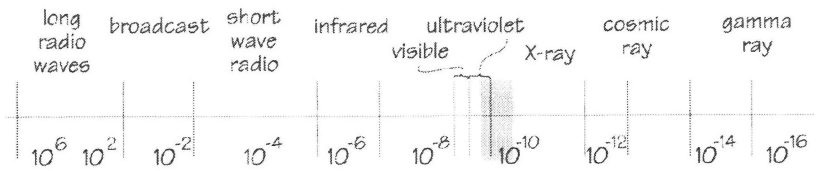
1.4 “...actually a high-pitched clicking sound



**Sonic orientation emission** of a large brown bat while cruising (*top*), beginning pursuit of prey (*middle*), and closing in on its prey (*bottom*).



Electromagnetic orientation emission of the *Myotis Lucifugus* while the animal is cruising (*top - old marine engine*), descending into the rainforest (*middle - idling outboard motor*) and approaching an obstacle (*bottom - buzz of a model airplane engine*).

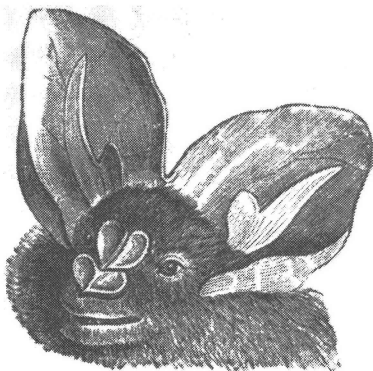


1.5 Electromagnetic spectrum

According to the Griffith hypothesis, the *Myotis lucifugus* has evolved a highly specialized variation of the standard echolocation capability. This tiny bat has developed elaborate nose leaves, which act as horns to focus the orientation emissions into an extremely sharp and precise beam (1.6). Furthermore, the orientation beam of the *Myotis lucifugus* is not the typical sonic beam, but is emitted as part of the electromagnetic spectrum falling generally in the range of the extreme ultraviolet (1.5).

### Variable Frequency

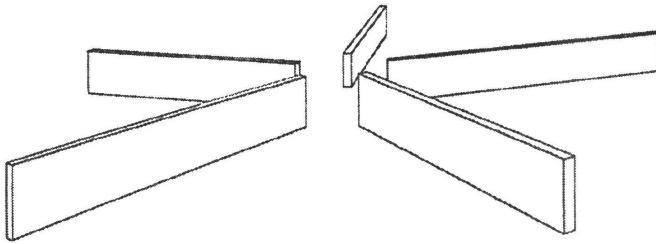
It has long been understood that in all echolocation systems the presence of obstacles in the flight path cause the bat to speed up its emissions to aid in the resolution of the “radar” image. The closer the object, the higher the frequency of the emission—the higher the frequency of the emission, the more detailed is the bat’s “picture” of its surroundings.



1.6 Elaborate nose leaves

As a bat cruises past at forty or fifty feet above the ground, the emissions have a frequency analogous to an old marine engine. As the bat swoops and begins to approach an obstacle, the frequency reaches the tempo of an idling outboard motor, and when contact with the obstacle is imminent, the emissions reach a frequency similar to the buzz of a model-airplane engine.

The key idea in Griffith's hypothesis centered on this variable frequency aspect of echolocation. Griffith reasoned that the *Myotis lucifugus* employed variable frequency echocations, as do other bats. However, the *Myotis lucifugus* applied variable frequency to its electromagnetic (rather than sonic) emissions. The key idea in the Griffith hypothesis was that as the *Myotis lucifugus* emission increased in frequency, the emission actually crossed the threshold from the extreme ultraviolet into the X-ray, thereby allowing the bat to fly unharmed through solid object.



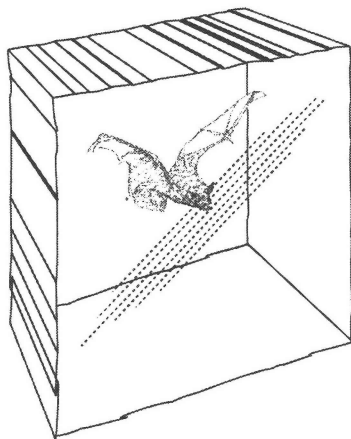
1.7. Griffith's radial pentagonal snaring device

Griffith reasoned that the *Myotis lucifugus*, one of the oldest genus of bats (with some 180 million years of evolution at its behest), had evolved this specialized high-frequency emission and the accompanying penetration abilities in response to the density of growth in its rainforest environment.

The research team was understandably enthusiastic about the Griffith hypothesis, but their enthusiasm was frustrated when on attempting to catch the Piercing Devil they found one bat after another flying through their nets. Griffith accordingly devised a brilliant snaring device consisting of a radial pentagonal construction with walls of solid lead eight inches thick, two hundred feet in length and twenty feet high, like five spokes of an enormous lead wheel (1.7). The team attached seismic instrumentation to the lead walls with sensors in a grid pattern spaced eighteen inches apart. The sensors were then fed to a seismograph which monitored every event on the forty thousand square feet of lead wall.

With all of the apparatus in place, the research team began to watch and wait. For nearly two months the instruments recorded nothing of more interest than a bush baby bumping into the base of one of the massive walls in its nightly ramblings. Griffith began to despair that perhaps the bats perceived the large pentagonal shape as unnatural to the environment of the tropical rain forest and, accordingly, the Piercing Devils were avoiding the four hundred foot diameter arena altogether.

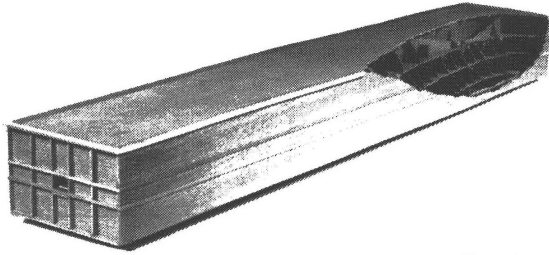
Finally, however, in the early morning of August 18th at 4:13 am, Griffith's instruments recorded the event that the team had been awaiting. The Number Three wall had received an impact of the magnitude of  $10 \times 3$  ergs, twelve feet above the forest floor, one hundred and ninety-three feet from the hub of the wheel. The team was hopeful that one of the Piercing Devils had strayed within the radius of the wheel.



1.8 "...eternally frozen in a mass of solid lead."

Unable to wait for dawn's first light, Griffith and his assistants packed the cumbersome equipment of a specially-designed portable X-ray viewer across the rain forest in the black of night. Precisely at the spot indicated by the seismometer, Griffith's X-ray viewer found, at a depth of  $7 \frac{1}{8}$  inches, the first *Myotis lucifugus* ever contained by man, eternally frozen in a mass of solid lead (1.8).





THE ARK

*Scale, 1 inch: 12.5 cubits*

### FORM OF BEQUEST

I hereby give and bequeath to the Museum of Jurassic  
Technology the sum of \_\_\_\_\_ dollars to be applied to  
the general purposes of the Museum.

signed \_\_\_\_\_

204

\$300

The Museum is glad to receive Natural History and other specimens,  
provided they are in good condition and are accompanied by adequate data.