

Appears to be a copy (in Mead's  
hand) of a report submitted to the War  
Dept.

## Geology and Physiography.

The region explored, from Parang, <sup>via Bulding</sup> Mindanao, <sup>Barrio</sup> to Lake Butig, and thence, via <sup>Barrio</sup> ~~Salt~~ the <sup>Barrio</sup> ~~pass~~ of Gatto Grande and the Vicars wagon road to Malabang, comprises the Butig mountain range, with its slopes and foothills, and forms on the north a portion of the Lake Lanao Basin. The pass ~~of the Butig Mountains~~ through which the expedition crossed the Butig range has an elevation of about 5000 feet, the highest peak to the right of the (Butig) trail being 7200 feet above sea level. The mountains are rounded but often steep at the summit, and usually, deeply furrowed from the apex downward, forming numerous narrow ridges separated by deep gullies. The deepest <sup>valleys</sup> gorges ~~are~~ contain swift-flowing streams of clear water, with numerous waterfalls and rapids. In one instance a ~~the~~ <sup>nearly vertical</sup> fall of about 200 feet was observed in a good-sized stream. Springs are numerous on the hillsides.

Drift covers most of the rock except

where bared by streams, and near mountain summits. The rock is mainly or entirely ~~igneous~~ igneous. On Nituan Creek, and at other places, a grayish-white rock resembling a hard limestone was found in ~~abundance~~ great quantity, covered by volcanic lava, and scoriae, and ash. Specimens of all these rocks were collected and placed in tin cans for transportation; but the box containing them was lost by the packers. In this way the only material to show the gross structure of these mountains was unfortunately lost. The soil at top is largely volcanic ash and gravel, below which is a broad expanse of slippery, clayey loam, ~~below which bordered by a~~ narrow littoral zone of sea sand at Panay.

### Plant Life.

The first few miles of the Butiq trail ~~lay~~, following the course of the Nituan River, lay through an open grassy country where the trees were mostly confined to ravines. Along the river and streams some of the timber is large; but, in general, the forests were light for the first 20 miles, after which the timber became dense and the trees very large. These heavy primeval forests are by no means impenetrable; on the contrary they are far easier to traverse than either the grass or jungle <sup>series</sup> countries. In these forests—the ~~stupendous~~ glory and future wealth of Mindanao—the atmosphere is dark and cold even at midday on bright days;

and the soil and foliage are always wet,  
at least during the rainy season. There are  
many kinds of timber trees. The rubber or  
guttapercha tree is common; and one of  
the vines exudes a copious milky juice that  
makes a very pure, elastic rubber. As the  
mountain summit is approached the trees  
dwindle in size; but some large trees  
were found on the highest passes of the divide  
(5000 feet). The tree fern and a small  
tree having large coriaceous leaves covered  
beneath with whitish tomentum were found  
sparingly on <sup>the</sup> grassy crowns of the higher  
peaks, which rise to 7000 feet or more.  
Only the <sup>very</sup> highest peaks were entirely bare of  
tree growth. Nearly every mountain peak  
was covered with green vegetation to the top;  
but in a few areas of considerable size volcanic  
ash and scoria had been poured out in  
such large amount and at such recent  
date as to cover up and prevent plant growth.  
The smaller shrubs, vines, and annuals are  
numerous in kinds; and many of the  
flowers are extremely attractive although  
seldom fragrant. A considerable variety  
of terrestrial orchids <sup>was</sup> were observed; and  
some occur as arboreal parasites. Nothing  
was so striking as the infinite variety of  
ferns. A dozen species belonging to half as many  
genera were counted upon the caudex of a  
tree-fern. Mosses, liverworts, fungi and  
other low forms of vegetation were exceedingly

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numerous. The fungi were of strikingly varied forms and beautiful coloration. Parasitic growth was the rule rather than exception, a single ~~leaf~~ living leaf often supporting a colony of varied lower ~~of~~ forms of plant life. On the mountain tops a change is evident, and numerous genera of plants found in the United States give a familiar aspect to a flora previously so strange to the eye of an American. The aquatic flora of Lake Butig ~~was~~ <sup>is</sup> peculiarly interesting and attractive. A small collecting outfit was unavoidably left at Parang; but a small collection of ferns, orchids, club-mosses (Lycopodium, Selaginella, etc.) and other small species was preserved and sent to the ~~U. S.~~ <sup>U. S.</sup> National Museum herbarium of the U. S. National Museum.

### Animal Life.

Mammals.— Monkeys, deer, hogs, civets, rats and bats were the only species seen; but there were numerous signs of small mammals. Doubtless all of the alpine species will prove to be new to science. With a supply of modern trapping appliances, <sup>which</sup> such as have been forwarded, but which had not reached me from the U. S. National Museum, many new mammalian forms could be added

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to the Mindanao fauna, and the types placed in our government museum.

Birds.— Birds seem scarce, owing to the denseness of the vegetation and great height of the forests. Tropical birds are shy and silent. When their forest haunts are invaded by such a large command of cavalry accompanied by a pack-train. Under such circumstances collecting is almost impossible; and my collecting outfit was accidentally left behind at Panday. Nevertheless much valuable data ~~was gathered~~ on avian distribution was gathered. The game birds were jungle fowl, quail, doves, pigeons, and parrots. Lake Butig is the home of ducks, snipe, water-hens, and numerous edible wading birds, some of which were shot for food. Eight species of birds were added to the sixty previously collected at Pantar, bringing the number of species added to the National collection up to about seventy. Two hundred and seven species of birds were previously known from the island of Mindanao.

Reptiles and Batrachians.— Lizards, ~~and~~ snakes and frogs were observed. The snakes were few in number, but some are poisonous.

The Fishes of Lake Butig would form a valuable addition to ichthyology.

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Invertebrates. - Land snails and other mollusks were collected. Butterflies, beetles, and other insects were abundant, and some of the butterflies were very beautiful. Mosquitoes were few, and only troublesome at Baldung, where malaria was rather prevalent among the Moros, to whom quinine was freely dispensed.

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Very respectfully  
Edgar A. Mearns,  
Mexico, D. C., U. S. A.