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Santa Cruz, Co
Patagonia
Photogeology

THE AMERICAN METAL COMPANY, LIMITED
205 MAYO-SCHLESSMAN BUILDING
1930 SHERMAN STREET
DENVER 3, COLORADO
TELEPHONE CHERRY 4-4423

MAIN OFFICE:
61 BROADWAY
NEW YORK 6, N.Y.

17th June 1955

Exploration Division
The American Metal Company, Limited
61 Broadway
New York 6, New York

Gentlemen:

Enclosed please find Mr. D. H. Elliott's report on "Photogeology of the Patagonia Region, Arizona".

Under separate cover I am forwarding uncolored copies of the six quadrangle maps at a scale of 1:31680, and the Index Sheet at a scale of 1:125,000.

Very truly yours,

Breck Parker

BP/mg
Enclosure

cc: E. N. Pennebaker (Including Report and maps.)

P. O. BOX 1007

PHONE 2-1892

D. H. ELLIOTT
PHOTOGEOLOGIST
CASPER, WYOMING

May, 1955

PHOTOGEOLOGY OF THE PATAGONIA REGION, ARIZONA

Introduction

The 1380 square miles covered in this project are in southern Arizona, north and east from Nogales. Soil Conservation Service airphotos, flown in 1936 at the scale of 2" = 1 mile were used in the stereoscopic study. All dips shown on the maps have been estimated.

The four-lens photography of the S.C.S. airphotos is now obsolete, but is the only photo coverage available for this area. Most of the airphotos are close to the specified scale of 2" = 1 mile except for the northeast part of the mapped area where they have a substantially larger scale.

In general, black india ink on the airphotos indicates lithologic contacts, violet india ink has been used for strikes and dips and bedding traces, and Paasche red airbrush liquid(alcohol base) has been used for faults, dikes, and joints. Veins, sills, and dikes have been grouped under the dike symbol.

Distinct lithologic breaks within formations have been marked on the photos and transferred to the final map, but are not colored or labeled separately as no specific information is available on them. Many small distinct areas have a marked darker or lighter color on the airphotos than the surrounding rock. In many cases, these have been outlined in black india ink and labeled as "white" or "dark" or "gray", and probably represent patches of somewhat different lithology.

A cotton swab dipped lightly in methanol alcohol can be used to remove ink lines on the airphotos.

The planimetric base maps used for this report were obtained from the Soil Conservation Service. U.S.G.S. Bulletin #582 was used as the basic reference for this mapping.

The photo data were compiled by tracing directly from the airphoto to the acetate base maps, while continually adjusting the photos to the drainage.

Sedimentary rocks

The only area of Cambrian rocks mapped was in the eastern part of the Helvetia quadrangle, in an area where jagged sandstone(?) cliffs are close to the banded Carboniferous and Devonian.

The Carboniferous and Devonian have been grouped as one unit as they cannot be differentiated from their photo expression. Their banded appearance is distinctive and easily recognized. In some places, isoclinal folding can be seen on the airphotos but cannot be shown or mapped because of its small scale. Several large folds in this formation have been mapped on the Empire Ranch quadrangle and the Elgin quadrangle.

The Cretaceous shale has a characteristicaaly smooth rounded hilly erosion pattern, as best shown in the eastern part of the Empire Ranch quadrangle. In some areas, such as the Balabasas quadrangle and the northwestern part of the Elgin quadrangle, the Quaternary(?) weathers to a similar smooth pattern, and it is not possible to determine from this study if these rocks are Cretaceous or Quaternary.

The Quaternary pediments mapped in the Helvetia quadrangle have the distinguishing features of braiding stream channels and a flat undissected surface.

The Quaternary shows as a thin cover.

Quaternary alluvium forms the flat bottoms of the dry stream channels.

Igneous rocks

The igneous intrusive rocks in most cases form high topography in this general area, and were not differantiated in this study. The photo texture is rough, and has no banding.

The Tertiary volcanics form both high and low topography, and are characterized by the banding, unoven topography, and mottled photo appearance.

General

In some cases, the contacts and lithologic units are clearly distinguishable on the photos. In other cases where the geology may be complicated and where the type of rock cannot be positively identified from the photo texture, mistakes in photo mapping probably have been made.

U.S.G.S. Bulletin #582 describes in detail the mineral deposits known in 1909. Recognizable propsect pits and mines shown on the 1936 airphotos are shown on the maps of this report.

D. B. Eliot