TWO UNKNOWN METEOR CRATERS IN ANTOFAGASTA, REGION, NORTHERN CHILE

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INTRODUCTION:

During a field work, in February and March 1976, according with a regional investigation of geomorphology, two new meteor craters was discovered at the nearest of the Salar de Atacama, in Antofagasta region, northern Chile. One of these craters was observed with R. Lagos A., geographer by the Universidad del Norte, and the author. The other was a communication from L. Huelaz A., archeologist of Smithsonian Institute and Universidad del Norte, whose attention had been strongly called by a singular form appreciated in an aerial photograph, during his archeological investigations.

THE METEOR CRATERS:

These new meteor craters are located, one of them at south of Salar de Atacama, at the Tilocalar Hills, 24° 59' lat. S. and 69° 08' long. W. The other one is at south-east of the Salar, at the Tujie Chain, 23° 50' lat. S. and 67° 57' long. W.

Considering local toponyms, propose the name "Meteor Crater of Tilocalar" for the first, and "Meteor Crater of Tujie" the second.

The dimensions of the Tilocalar Crater, obtained from a topographic map of I. O.N.-Chile (scale 1:50,000), are 400 mts. in E-W direction, and 300 mts. in N-S direction. His major depth is around 50 mts. in the north part, where are lacustrine sediments of temporal water accumulations. This crater is located at 3,100 mts. over the sea level.

The Tujie Crater has 350 mts in E-W direction and 300 mts. in N-S direction, dimensions obtained by the same way before mentioned. His major depth is nearest of 60 mts. at the east section. This crater also present a little deposition of lacustrine sediments. The altitude of the area where the crater is located is 3,550 mts. over the sea level.

GEOLGY OF THE AREA OF TILOCALAR METEOR CRATER:

This Meteor Crater is on a Tertiary ignimbritic plateau, which was to much eroded during the Pluvial Periods of Pleistocene, leaving long and narrow tubular surfaces limited by scarps. One of this orographic units is the Tilocalar Hills ("Lucas de Tilocalar").
This ignimbritic plateau is overlayed to a intrusive of granitic rocks of Jurassic and Cretacic age.

Immediately at north of the Meteor Crater there are a Quaternary lava cone, which is constituted by andesitic and basaltic rocks.

The meteor cuts a superficial deposit of picritic rocks and the ignimbritic formation. Finally, it strokes the surface of the granitic intrusive.

Today, only is possible to find some traces of meteor iron in quartz fragments and recrystalized rocks, because this area is, from a long time ago, walk across by Aymara indian troops, in attention to the numerous trails that exist in there.

People who live in the nearest says that this indians have meteoric fragments in their houses by generations, how a gift of the heaven.

GEOLGY OF THE AREA OF TULLE MINOR CRATER.—

This crater is located in the upper of the scarp of a ignimbritic plateau, which is also dated has Tertiary.

The meteor pulverized the ignimbrite, without take contact with the subjacent rocks, and spread its fragments in an area of 1.3 square kilometers around of the crater, aproximately.

There is not rests of the hexahedrite in here in attention to the same reason before.

HEXAHEDRITES AND METEOR CRATERS OF NORTHERN CHILE.—

With this two new meteor craters described summary here, the list of hexahedrites and meteor craters of northern Chile is the following, in order of latitude: (completed from Henderson, 1941).

<table>
<thead>
<tr>
<th>Name</th>
<th>Lat. South</th>
<th>Long. West</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negritos (H)</td>
<td>20° 14'</td>
<td>(On the Iquique Rapa)</td>
</tr>
<tr>
<td>Rio Boa (H)</td>
<td>21° 26'</td>
<td>70° 05'</td>
</tr>
<tr>
<td>Coya Norte (H)</td>
<td>22° 20'</td>
<td>69° 40'</td>
</tr>
<tr>
<td>Cerros del Ruy Muerto (H)</td>
<td>22° 40'</td>
<td>69° 50'</td>
</tr>
<tr>
<td>Puripica (H)</td>
<td>22° 45' aprox.</td>
<td>69° 05' aprox.</td>
</tr>
<tr>
<td>Sierra Cerra (H)</td>
<td>22° 53'</td>
<td>69° 19'</td>
</tr>
<tr>
<td>Pilcanina (H)</td>
<td>23° 00'</td>
<td>69° 25'</td>
</tr>
<tr>
<td>Union (H)</td>
<td>23° 04'</td>
<td>69° 30'</td>
</tr>
<tr>
<td>Negritos (H)</td>
<td>23° 07'</td>
<td>70° 30'</td>
</tr>
<tr>
<td>Tule (H)</td>
<td>23° 50'</td>
<td>67° 57'</td>
</tr>
<tr>
<td>Monsauqui (H)</td>
<td>23° 55' 25''</td>
<td>68° 15' 40''</td>
</tr>
<tr>
<td>Italas (H)</td>
<td>24° 17' aprox.</td>
<td>68° 50' aprox.</td>
</tr>
<tr>
<td>Tilocolar (H)</td>
<td>24° 59'</td>
<td>69° 08'</td>
</tr>
<tr>
<td>San Martin (H)</td>
<td>30° 00'</td>
<td>71° 18'</td>
</tr>
</tbody>
</table>

(H) : Hexahedrites
(HC) : Meteor Craters
Complete this list, we must mention to Fletcher, 1889, who describes thirteen meteorites found in the Atacama Desert, referred under the following names and relative localizations: "Some of these meteorites, Najarro, Polanco and Monticola, were all found within a few leagues of the Bay of Najarro; Varas and junior were found nearly a hundred miles away, and about forty miles apart; Vaca, Quanta, Chichiuya, Copalo and Lutschuminig, and probably also Indi, came from a more southern part of the Desert, while Barrenas Blanco and Junquil were brought from the southeast; Joch was discovered in an unmentioned part of the Desert." (Fletcher, p. 224).

Some of them below to the named in the list upper detailed.

CHRONOLOGICAL CONSIDERATIONS.

Just considering some geomorphological and lithological aspects so that:
1) The Ticochara Meteorite casts, on the surface, a deposit of quaternary piroclastic rocks, and 2) This crater and the others of Peñol and Monte-volvi, in the nearest, maintain their circular form perfectly limited by the original scarp, means that they were not exposed to erosion during the Pleistocene Pluvial Period, we think that the meteorites fell could happen during or immediately after the last Pluvial Period.

However, it is necessary, other tests to determine the exactly date of the impacts.
REFERENCES

Fletcher, L. On the Meteorites which have been found in the Desert of Atacama and its neighbourhood. In: The Mineralogical Magazine and Journal of the Mineralogical Society, 3(40): 223-264. Octubre 1899.
