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Rogelio Daniel Acevedo
Maximiliano C.L. Rocca
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Impact Craters in South America

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 Springer

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Contents

1	Introduction	1
1.1	Impact Craters in South America	2
	References.	5
2	Argentina	7
2.1	The Campo del Cielo (27° 30' S, 61° 42' W).	7
2.2	Bajada del Diablo (42° 48' S, 67° 26' W)	10
2.3	Río Cuarto (32° 52' S, 64° 13' W)	13
2.4	Salar de Antofalla (26° 15' S, 68° W)	14
2.5	Salar del Rincón (23° 58' S, 67° 01' W)	15
2.6	Salar del Hombre Muerto (25° 12' S, 66° 55' W)	15
2.7	Salar de Arizaro (24° 55' S, 67° 27' W).	17
2.8	Sierra de Ambato (28° 03' S, 66° 03' W).	17
2.9	Cuesta de Miranda (29° 25' S, 67° 40' W).	18
2.10	Structures Which May Not Be Impact Craters	18
2.10.1	Tonono (22° 16' S, 63° 28' W).	18
2.10.2	Las Garzas (28° 43' S, 59° 29' W)	20
2.10.3	Alicurá (40° 35' S, 70° 54' W)	20
2.10.4	Los Mellizos (47° 20' S, 70° W)	20
2.10.5	Santa María (26° 44' S, 66° W)	22
2.10.6	Alpa Corral (32° 41' S, 64° 50' W).	23
2.11	South Atlantic Geophysical Anomaly: Islas Malvinas/Falkland Islands (51° S, 62° W)	23
2.12	Problematic Structures Found in the Patagonian Volcanic Landscapes	25
2.12.1	Bajo Hondo (42° 15' S, 67° 55' W)	25
2.12.2	Barda Negra (39° 10' S, 69° 53' W)	26
2.12.3	Telsen (42° 28' S, 67° 27' W)	27
2.12.4	Llama Niyeo (41° 55' S, 68° 40' W).	27

2.12.5	Cortaderas (41° 08' S, 66° 52' W)	27
2.12.6	Pali Aike (52° 04' S, 69° 29' W)	28
2.12.7	Laguna Sirven (46° 50' S, 68° 53' W)	29
2.12.8	Gran Altiplanicie Central (48° 25' S, 70° 08' W)	30
2.12.9	Gregores (48° 37' S, 70° 02' W)	30
2.12.10	Meseta del Canquel (44° 28' S, 68° 35' W)	30
2.13	The Impact Ejecta of the Atlantic Coast, Buenos Aires, and La Pampa Provinces: The so-Called “Escorias” and “Tierras Cocidas”	32
2.13.1	La Dulce (38° 14' S, 59° 12' W)	33
2.13.2	General San Martín (38° 00' S, 63° 18' W)	34
2.13.3	D’Orbigny (37° 38' S, 61° 43' W)	35
2.13.4	Bajo del Gualicho (40° 22' S, 65° 15' W)	35
	References.	36
3	Bolivia	41
3.1	Iturralde (12° 35' S, 67° 38' W)	41
3.2	Llica (19° 49' S, 68° 19' W)	42
	References.	44
4	Brazil	45
4.1	Proven Impact Origin	45
4.1.1	Araguainha (16° 46' S, 52° 59' W)	45
4.1.2	Serra da Cangalha (8° 05' S, 46° 51' W)	47
4.1.3	Vargeao (26° 48' S, 52° 10' W)	48
4.1.4	Riachao (7° 43' S, 46° 38' W)	49
4.1.5	Vista Alegre (25° 57' S, 52° 41' W)	50
4.2	Possible Impacts	51
4.2.1	Gilbues or Santa Marta (10° 10' S, 45° 14' W)	51
4.2.2	São Miguel do Tapuio (5° 38' S, 41° 24' W)	52
4.2.3	Cerro Jarau (30° 12' S, 56° 33' W)	53
4.2.4	Inajah (8° 41' S, 50° 58' W)	53
4.2.5	Colônia (23° 52' S, 46° 42' W)	53
4.3	Features Suspected to Be of Impact Origin.	54
4.3.1	Rondonia (Madeirinha) (10° 13' S, 61° 23' W)	54
4.3.2	Late Pleistocene Shallow Palaeolakes	56
4.3.3	Lagõa Salgada (7° 04' S, 35° 58' W)	56
4.3.4	Urucuia (16° 18' S, 45° 46' W)	56
4.3.5	Palmeira dos Índios (9° 26' S, 36° 39' W)	57
4.3.6	Cruz (7° 49' S, 38° 13' W)	57
4.3.7	Sete Lagõas (19° 24' S, 44° 12' W)	57

4.4	More Doubtful Structures.	59
4.4.1	Aimorés (19° 25' S, 41° 03' W)	59
4.4.2	Ubatuba (23° 18' S, 44° 56' W)	59
4.4.3	Piratininga (22° 28' S, 49° 09' W)	59
4.4.4	Curuçá (5° 11' S, 71° 38' W)	60
	References.	60
5	Chile	63
5.1	Monturaqui (23° 56' S, 68° 17' W)	63
5.2	Quillagua (21° 39' S, 69° 31' W)	63
5.3	Vaca Muerta (25° 45' S, 70° 30' W)	66
5.4	Imilac (24° 13' S, 68° 53' W)	66
	References.	67
6	Colombia	69
6.1	Río Vichada (4° 30' N, 69° 15' W)	69
	References.	72
7	Paraguay	73
7.1	Ypacaraí (25° 18' S, 57° 16' W)	73
7.2	Negla (22° 29' S, 56° 44' W)	73
7.3	San Diego (23° 2' S, 57° 34' W)	74
8	Perú	77
8.1	Carancas (16° 40' S, 69° 02' W)	77
	References.	79
9	Uruguay	81
9.1	The Atlantic Ocean Coast of Uruguay and Southern Brazil	81
9.2	A Search for New Possible Impact Craters/Structures in Uruguay.	82
	Reference	83
10	Venezuela	85
10.1	Ichum (4° 17' N, 63° 21' W)	85
10.2	Guaniamo (6° 36' N, 65° 45' W)	85
10.3	Black-Mat Site MUM7B (8° 46' N, 70° 49' W)	87
	References.	87
11	The Guianas	89
11.1	Guyana	89
11.1.1	Rupununi (2° 10' N, 59° 10' W)	89
11.1.2	Pubu (5° 7' N, 58° 41' W)	90

11.2	Suriname	91
11.2.1	Wayombo (5° 24' N, 56° 4' W)	91
11.2.2	Benzdorp (3° 38' N, 54° 12' W)	92
	Reference	92
12	South Pacific Ocean Eltanin (57° 52' S, 90° 57' W)	93
	References.	94
13	Astroblemes-Wrong (Structures that Resemble Astroblemes but They Are Not)	95
13.1	Argentina.	95
13.1.1	Isla de los Estados (54° 48' S, 64° 25' W)	95
13.1.2	Morro de Cuero (34° 15' S, 69° 34' W)	95
13.1.3	Golfo de San Jorge (46° S, 67° W)	95
13.2	Bolivia	97
13.2.1	Jayu Kota (19° 28' S, 67° 26' W)	97
13.3	Chile.	97
13.3.1	Rano Kau (27° 11' S, 109° 26' W)	97
13.4	Colombia.	99
13.4.1	Guatavita (4° 58' N, 73° 46' W)	99
	References.	99
14	Final Remarks	101
	Index	103

Chapter 1

Introduction

Impact cratering is recognized as the dominant surface-modifying process throughout the Solar System. During the last 40 years, planetary geology scientists have demonstrated that our Moon, Mercury, Venus, and Mars are all covered with asteroid/comet impact craters or related structures. However, only recently the fact that giant meteorite impact cratering is an important geologic event working on the Earth's surface too has been accepted.

Large asteroid/comet impact events are one of the worst possible catastrophes for any habitable planets anywhere in the galaxy (Gehrels 1994). The impact of an asteroid/comet larger than 50 km in diameter will release more than enough kinetic energy as to melt the whole solid surface of the planet, to vaporize the water oceans, and to sterilize any kind of life of Earth-like livable planet known so far.

The impact of asteroids and comets with diameters in the range between 2 and 15 km is an active process and examples of such catastrophic phenomena can be found also in the Earth's geological record (Melosh 1989; Hodge 1994; French 1998; Osinski and Pierazzo 2012). A good example is the Chicxulub impact crater (170 km in diameter) in Yucatán, Mexico, which is no doubt connected to the K–T mass extinction event.

Some terrestrial bowl-shaped depressions and structures have morphological characteristics consistent with both a simple-type craters or a complex impact structure, but lack either pieces of the impacting body (meteorites) or definitive signs of shock metamorphism (shatter cones, planar deformation features, impact glasses, and high pressure polymorphs). In most cases, this may be only because suitable samples cannot be recovered from the impact site, as they are submerged beneath a deep circular lake, buried under post-impact sedimentary rocks, jungle covered, or almost completely eroded.

In this extensive and exhaustive catalog we are going to report all the geological structures which have been mentioned or suggested as impact craters. We are going to give information about the well-stated and very well-confirmed, the possible ones, and even about many of the doubtful or rejected structures.