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OCCURRENCE OF CIRCULAR FEATURES IN PARTS OF THAR DESERT, RAJASTHAN

P. C. BAKLIWAL AND SM. RAMASAMY
Geological Survey of India, Jaipur

The Thar Desert covering parts of Western India and Eastern Pakistan is a well defined arid zone and is marked with characteristic eolian sediments exhibiting longitudinal, transverse, barchan, parabolic and mixed dune fields. The oldest rock types exposed in Thar Desert belong to Malani Igneous Suite (740 m.y.) which acted as the basement for Mesozoic sedimentaries in Jaisalmer area. The Tertiary sediments in turn overlie the Mesozoics in the Jaisalmer area (Pareek, 1981).

The study of LANDSAT imagery of Jaisalmer area on1 : 1 million scale on all four bands reveal the occurrence of circular features in a NE-SW trending 100 to 130 km wide zone in the vast sand country (Fig. 1). These features are almost circular and rarely elliptical (No. 13 and 14) with the diameter ranging from 3 to 10 km (Table-I) and are normally observed with a darker tone/spot in the centre and a number of concentric rings of different grey tones enveloping it. Fig. 2 is an overlay of a part of LANDSAT imagery showing typical circular features. Almost all these circular features are seen in Tertiary sediments except a few located in Mesozoics.

The study of these circular features with the help of surface and subsurface geological information available indicate their inter-relationship with subsurface structures (Dasgupta, 1975) established through E. M. and seismic data of O. N. G. C. The circular feature No. 1 coincides with subsurface Longewala structure and No. 2 falls in the eastern rim of Bandtoba structure and also seen to be located in the northwestern continuity of Ramgarh fault. Similarly, the circular feature No. 3 coincides with Vikharan Nai structure and 4 falls near an anticlinal flexure found west of Ramgarh fault. Features 5, 6 and 7 also fall in close proximity of Mari-Jaisalmer arch, along and in the near vicinity of which a number of subsurface structures were interpreted by Dasgupta (1975). The Mari-Jaisalmer arch lineament, the expression of which is a well-defined fault in the Mesozoics of Jaisalmer area, is a major NW-SE trending curvilinear lineament showing evidence of repetitive tectonism and deep magmatism (Bakliwal and Ramasamy, 1983). Hence, subsurface structures associated with repetitive reactivation of this lineament cannot be ruled out. Features 5, 6 and 7 may, therefore, reflect basement structures associated with tectonism of Mari-Jaisalmer arch. These circular features do not exhibit any marked expression in the field as well as in the aerial photographs.

In the light of the above correlation of these features (1 to 7) with subsurface domes and basins of probable hydrocarbon accumulation (Dasgupta, 1975), the other circular features numbering 8 to 29 may also be the surface manifestation of such subsurface structures occurring in similar geological environment which may prove favourable locii for hydrocarbon accumulation. It is suggested that these circular features, deciphered from remote sensing, warrant immediate attention in the search for hydrocarbons.

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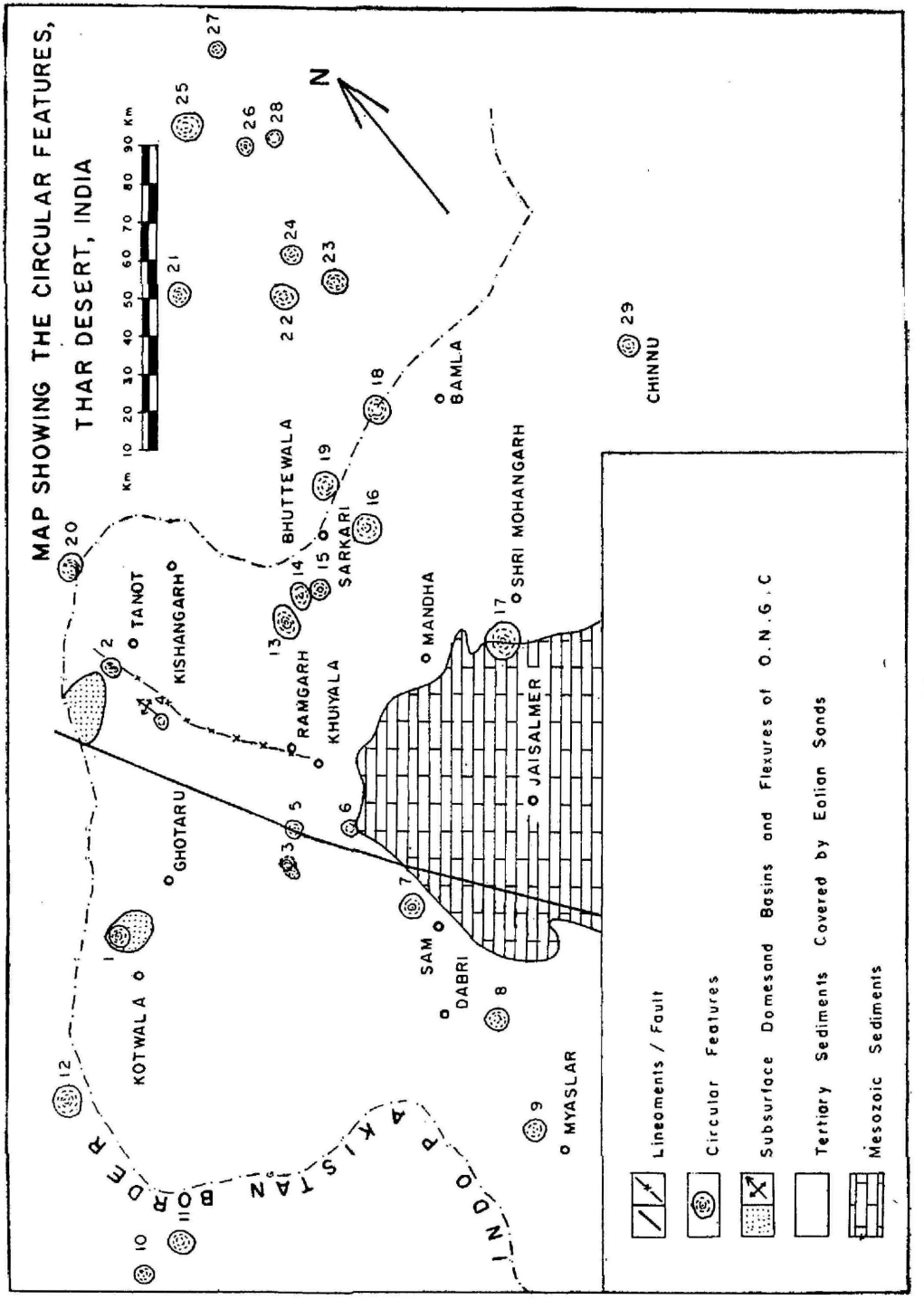
MAP SHOWING THE CIRCULAR FEATURES,
THAR DESERT, INDIA
Km 10 20 30 40 50 60 70 80 90 Km
N
TANOT
KISHANGARH
GHOTARU
KOTWALA
RAMGARH
KHUIYALA
BHUTTEWALA
SARKARI
MANDHA
SAM
DABRI
MYASLAR
JAISALMER
SHRI MOHANGARH
BAMLA
CHINNU
BARMER
JAISALMER
Lineaments / Fault
Circular Features
Subsurface Domesand Basins and Flexures of O.N.G.C
Tertiary Sediments Covered by Eolian Sands
Mesozoic Sediments

Figure 1.

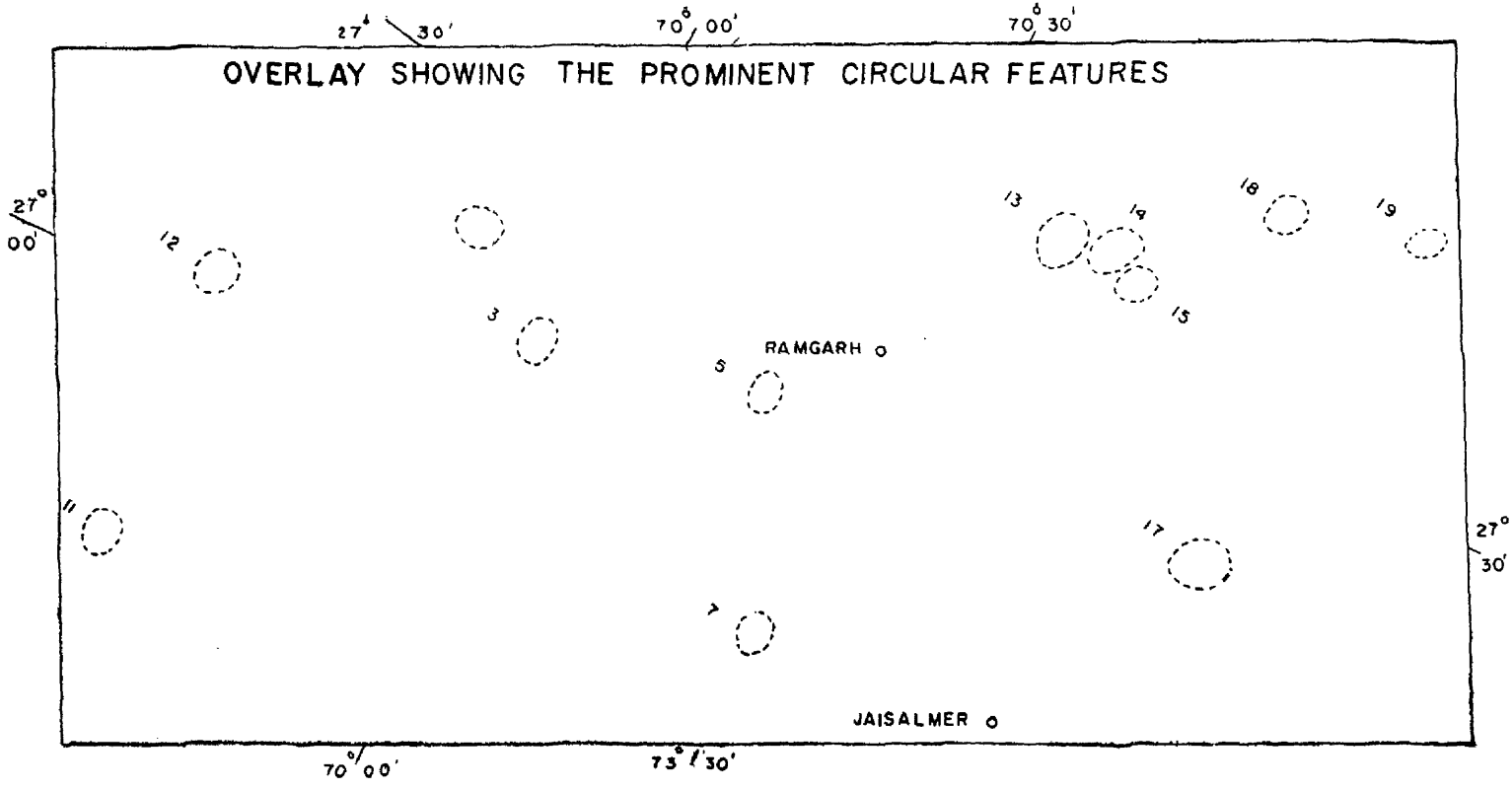
OVERLAY SHOWING THE PROMINENT CIRCULAR FEATURES
27° 30'
70° 00'
70° 30'
27° 00'
27° 30'
70° 00'
73° 30'
RAMGARH
JAISALMER
11
12
3
5
7
13
14
15
16
17
18
19

Figure 2.

TABLE I.

Circular Feature No.	Coordinate	Average Diameter in kms	Nearest Location
1.	27°16'30" : 69°52'00"	5	Ghotaru
2.	27°46'30" : 70°15'30"	5	Tanot
3.	27°10'30" : 70°18'30"	3	Bandha
4.	27°36'00" : 70°18'00"	3	Bandha
5.	27°12'30" : 70°24'30"	5	Bandha
6.	27°08'00" : 70°31'00"	4	Habur
7.	26°54'00" : 70°31'00"	6	North of Sam
8.	26°33'00" : 70°30'30"	6	Dabri
9.	26°18'00" : 70°24'00"	6	Myajlar
10.	26°36'30" : 69°22'00"	5	Rajar (Pakistan)
11.	26°36'00" : 69°28'00"	7	Rajar (-do-)
12.	27°04'00" : 69°30'00"	8	Mundo (-do-)
13.	27°36'00" : 70°44'00"	8	Bhuttewala
14.	27°37'00" : 70°48'30"	5	-do-
15.	27°36'30" : 70°51'00"	5	-do-
16.	27°38'00" : 71°03'00"	6	Sarkari Tala
17.	27°14'30" : 71°08'00"	10	Shri Mohan Garh
18.	27°51'00" : 71°16'00"	7	Bahla
19.	27°51'30" : 71°16'00"	6	Bahla
20.	28°01'00" : 70°23'00"	6	Kishangarh (Indo-Pakistan border)
21.	28°20'00" : 71°04'00"	5	Far North of Bamla (Pakistan)
22.	28°11'30" : 71°16'00"	5	-do-
23.	28°09'00" : 71°24'00"	6	-do-
24.	28°15'00" : 71°22'00"	5	-do-
25.	28°38'30" : 71°22'00"	8	-do-
26.	28°30'30" : 71°29'00"	3	-do-
27.	28°43'30" : 71°34'00"	3	-do-
28.	28°29'00" : 71°31'00"	4	
29.	27°34'00" : 71°54'00"	4	Near Chinnu

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