

The formation of IV from III does not seem to be a case of direct Claisen rearrangement. It appears that III again rearranges to II which in turn gives IV as a normal rearrangement product followed by cyclisation with the *ortho* phenolic group.

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SYNTHESIS OF 2-*p*-CHLOROPHENOXYMETHYLCHROMONE

SEVERAL synthetic approaches have been tried for the chromanochromone skeleton (III), in view of interesting pesticidal properties of the rotenoids¹. A simple route to phenoxyethylchromones (II) is described; however the initial attempts at its conversion to the parent tetracyclic system (III) have not been successful.

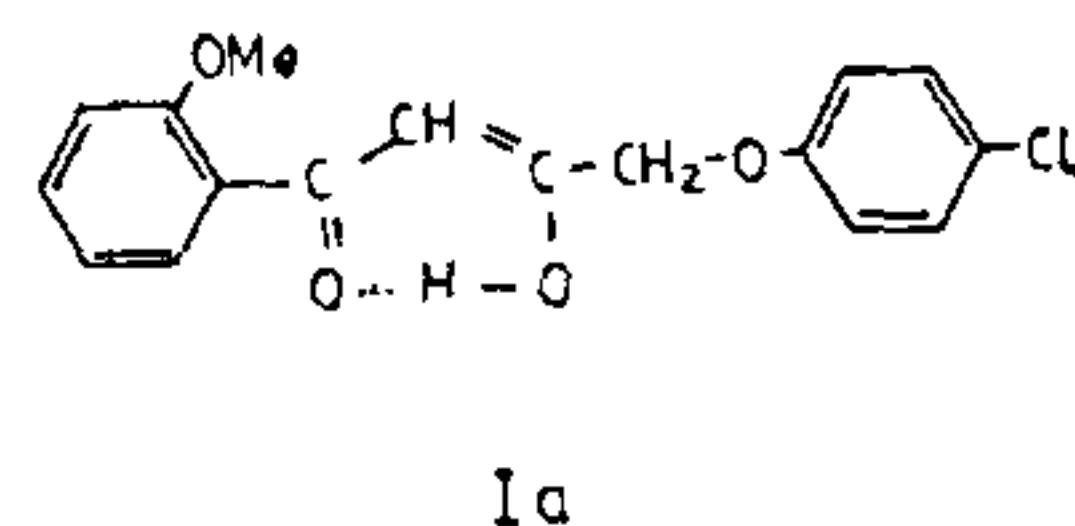
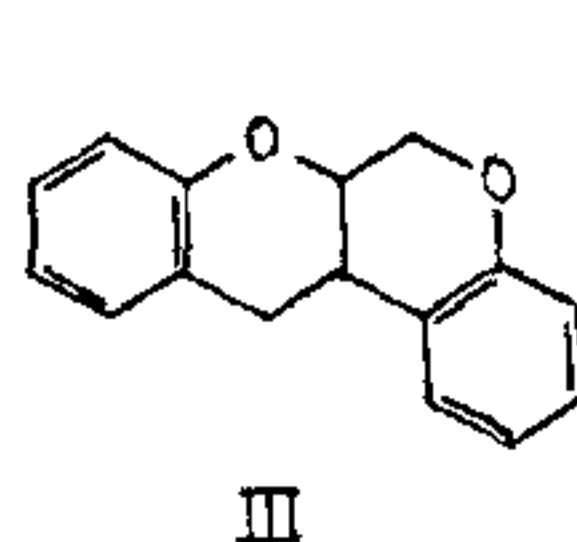
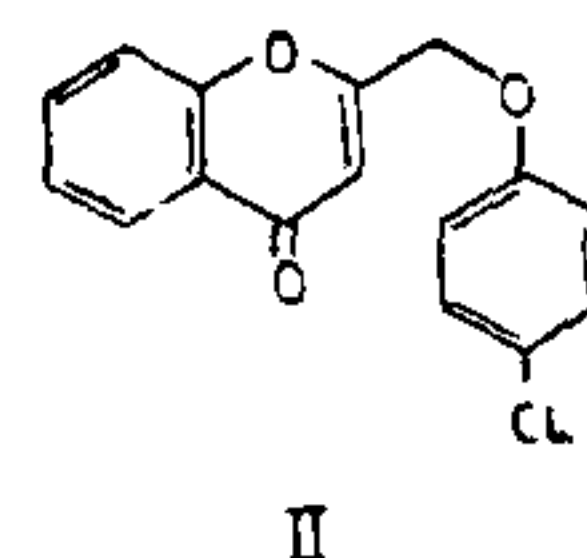
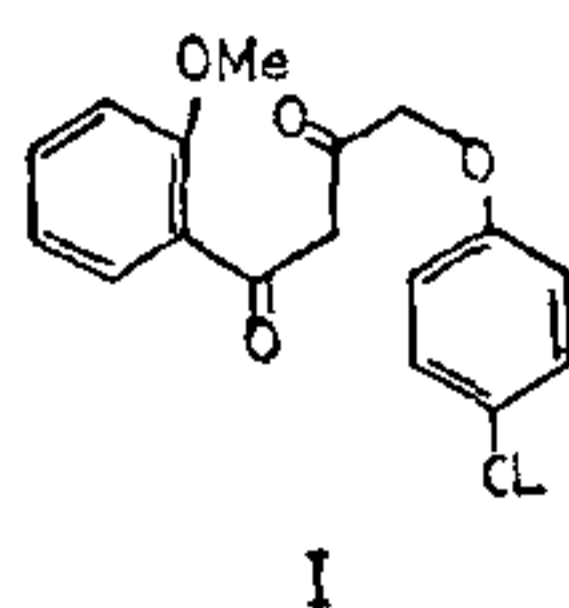
A Claisen-Schmidt condensation of *o*-methoxyacetophenone and ethyl *p*-chlorophenoxyacetate occurred in the presence of potassium tert. butoxide leading to the β -diketone (I). Spectral evidence indicated that the diketone exists in the enol form (Ia): i.r. 3040, 1617 cm^{-1} (broad, intense) characteristic for enol form of β -diketone^{2,3}; n.m.r. (CDCl_3) δ 3.78 (3H, s, -OMe), 4.67 (2H, s, -CH₂OAr), 6.8-8.1 (9H, m, 8 arom. + 1 conj. olefinic), 16 (1H, br. s, enol OH)⁴ (the methoxyl and the methylene peaks had shoulders and there was a small absorption integrating 0.2H at 4.2 δ probably arising due to tautomers).

Treatment of the diketone (I) with refluxing hydriodic acid led to demethylation and cyclisation to 2-*p*-chlorophenoxyethylchromone (II); i.r. 1655 cm^{-1} (α , β - α' , β' -unsaturated ketone)³ and absence of hydroxyl absorption; n.m.r. (CDCl_3) δ 4.98 (2H, s, OCH₂Ar), 6.59 (1H, s, 3H cf pyrone), 6.9-8.4 (8H, m, arom.)⁴

Experimental

1-*o*-Methoxyphenyl-1, 3 4-*p*-chlorophenoxybutan-1,3-dione (I): A mixture of *o*-methoxyacetophenone

(3.7 g), ethyl *p*-chlorophenoxyacetate (5.4 g) and potassium tert butoxide (from 1 g of potassium and 30 ml tert. butanol) was stirred under inert anhydrous conditions at room temperature for 30 min. The reaction mixture was acidified to Congo red with 3N hydrochloric acid, and the butanol removed under reduced pressure. Ether was added, the aqueous phase separated and the ethereal solution washed with sodium bicarbonate solution and brine. After drying (Na_2SO_4) and removal of solvent, the ether solution yielded the diketone (6 g), crystallised from aqueous acetone, m.p. 106°. It gave an intense blood-red colouration with alcoholic ferric chloride. Found: C, 63.79; H, 4.53; Cl, 11.25%. $\text{C}_{17}\text{H}_{15}\text{O}_4\text{Cl}$ requires C, 64.04; H, 4.74; Cl, 11.13%.



2-*p*-Chlorophenoxyethylchromone (II): The diketone (I) (2.2 g) and purified hydriodic acid⁵ (75 ml) were refluxed at 130° for 40 min. The reaction mixture was cooled and diluted with water when a dark sticky solid precipitated. It was taken up in warm pyridine and a little water added when a gummy material was formed. To the clear warm filtrate were again added a few drops of water, and the sticky material formed discarded⁶. The clear hot solution was chilled when the chromone (II) precipitated as a fine yellow solid (1.3 g). It crystallised from aqueous ethanol, m.p. 132°. Found: C, 66.84; H, 4.03; Cl, 12.52%. $\text{C}_{16}\text{H}_{14}\text{O}_3\text{Cl}$ requires C, 67.04; H, 3.87; Cl, 12.37%.

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A MAGNETIC SURVEY ON CHARNOCKITES IN THE VICINITY OF VISAKHAPATNAM

Introduction

A VERTICAL magnetometric survey is carried out on an area of 2.2 square furlongs in the vicinity of Visakhapatnam to trace the extension of some of the outcropping charnockite bands. The area is situated about 15 miles NNE of Visakhapatnam and is shown in Fig. 1. The topography of the area is characterised by a small hillock of 50 ft elevation ENE of the area and another of 15 ft. elevation WNW with outcropping khondalites. Charnockites have a higher intensity of magnetisation compared with the country rocks, khondalites. The higher intensity of magnetisation helps in tracing their presence and extent.

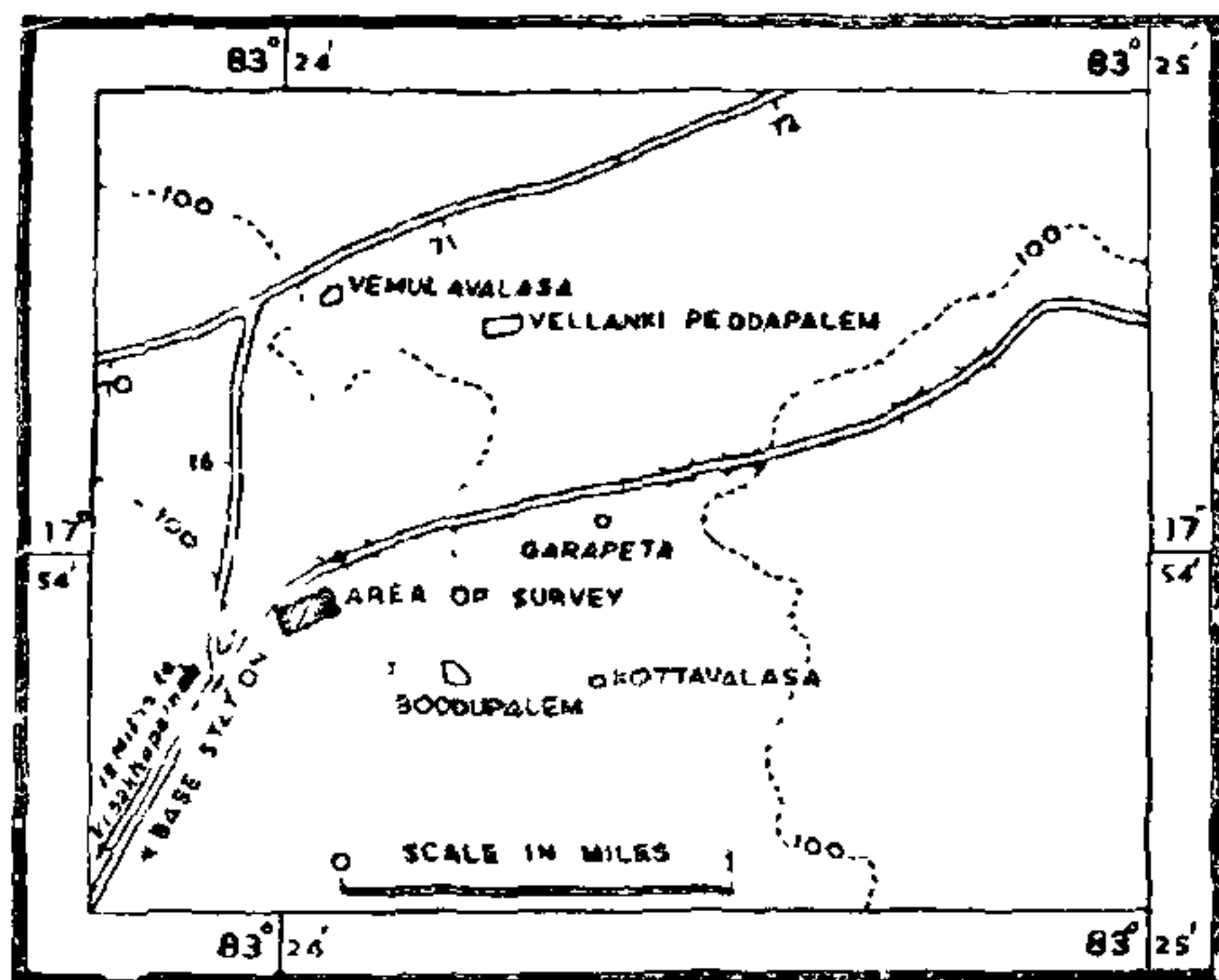


FIG. 1. Location map.

Geology of the Area

The geology of the area is closely connected with the general geology of Eastern Ghats, which constitute mostly khondalites and intervening charnockites. The khondalite series is represented by garnet sillimanite gneisses, garnet-biotite-sillimanite gneisses and quartzites and the charnockite series by leptynites,

charnockites, granites and pegmatites. The khondalite series strike NW-SE with steep dips towards SW. The sillimanite gneisses and quartzites are interbedded. The banding in the charnockite series is parallel to that of the surrounding khondalites. The basic members of the charnockite series are black to gray in colour, hard and compact and medium to coarse grained. The members of the charnockite series are intimately associated with each other and occur together.

Magnetic Survey

A vertical magnetometric survey is carried out with a Gf6 Schmidt-type Askania vertical magnetic field balance having a scale value of 92 gammas. The area is covered with 540 magnetic observations at intervals of 20 feet along lines separated from each other by 100 ft. The profile lines are laid along the direction N 45° E. The observations are corrected for diurnal variation of the vertical component of the geomagnetic field by observations made at intervals of 15 minutes at a magnetically undisturbed Base Station situated half-a-mile outside the area of survey. The vertical magnetic anomalies are shown contoured in Fig. 2.

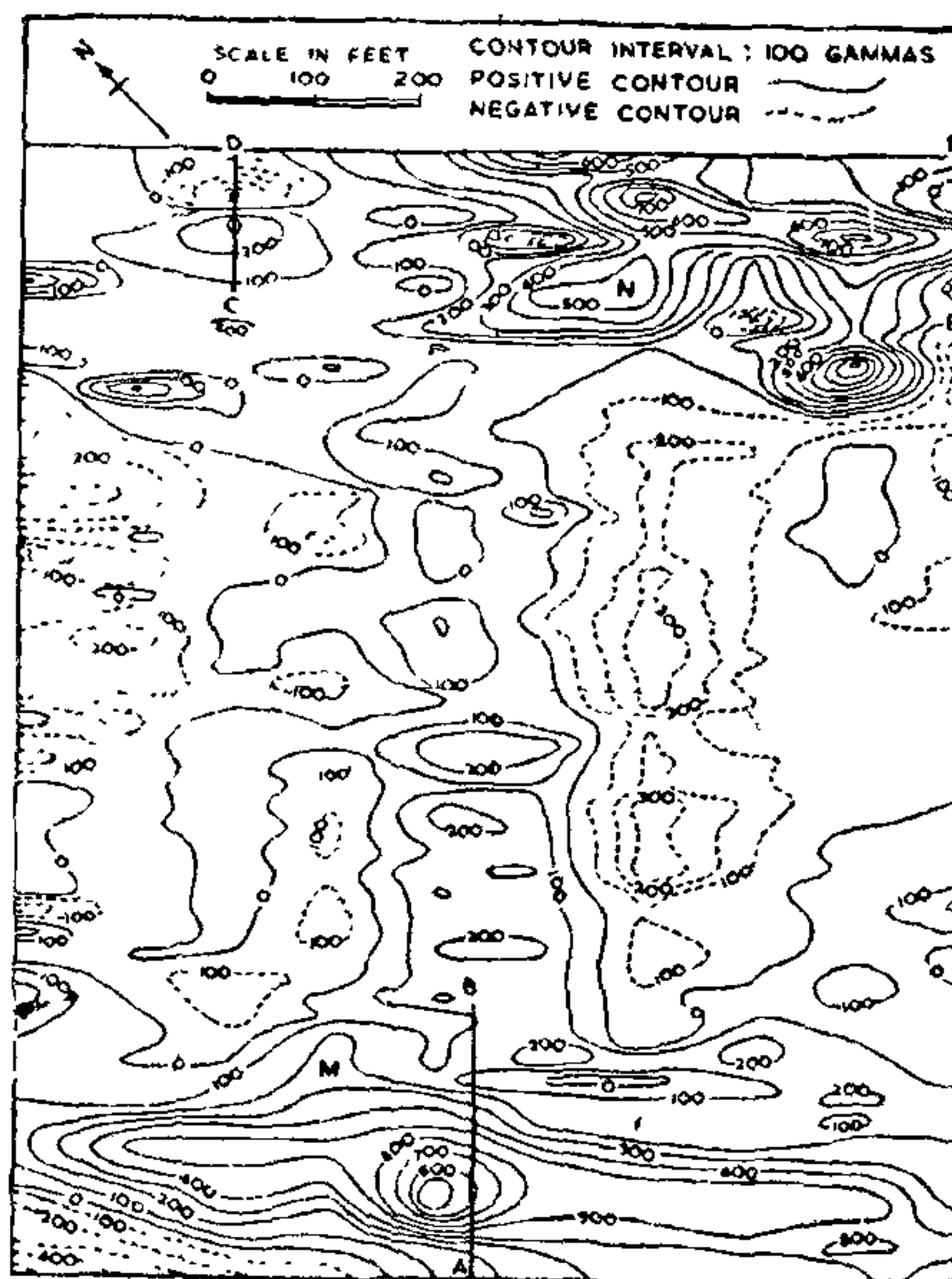


FIG. 2. Vertical magnetic anomaly map.

Results and Interpretation

The magnetic anomalies range from -400 gammas to 1000 gammas with the major portion of the area