When the atom is subjected to an electrostatic field the charge distribution gets displaced with respect to the positively charged nucleus. The polarization effect depends on the effective volume of the electron cloud and hence, it must be related to the cube of the average radius of the charge distribution. It is reasonable to assume that the charge distribution which responds to the electric field will have similar characteristics as the one which determines χ_M. Thus in spherically symmetric atoms like the atoms of noble gases one may expect some simple relationship between the diamagnetic susceptibility and electronic polarizability.

In Fig. 1, the square root of the modulus of molar susceptibility[1], $|\chi_M|^{1/2}$, is plotted against the cube root of electronic polarizability[2], $\alpha^{1/3}$, for five noble gas atoms. Except in the case of neon the remaining four elements lie on a straight line.

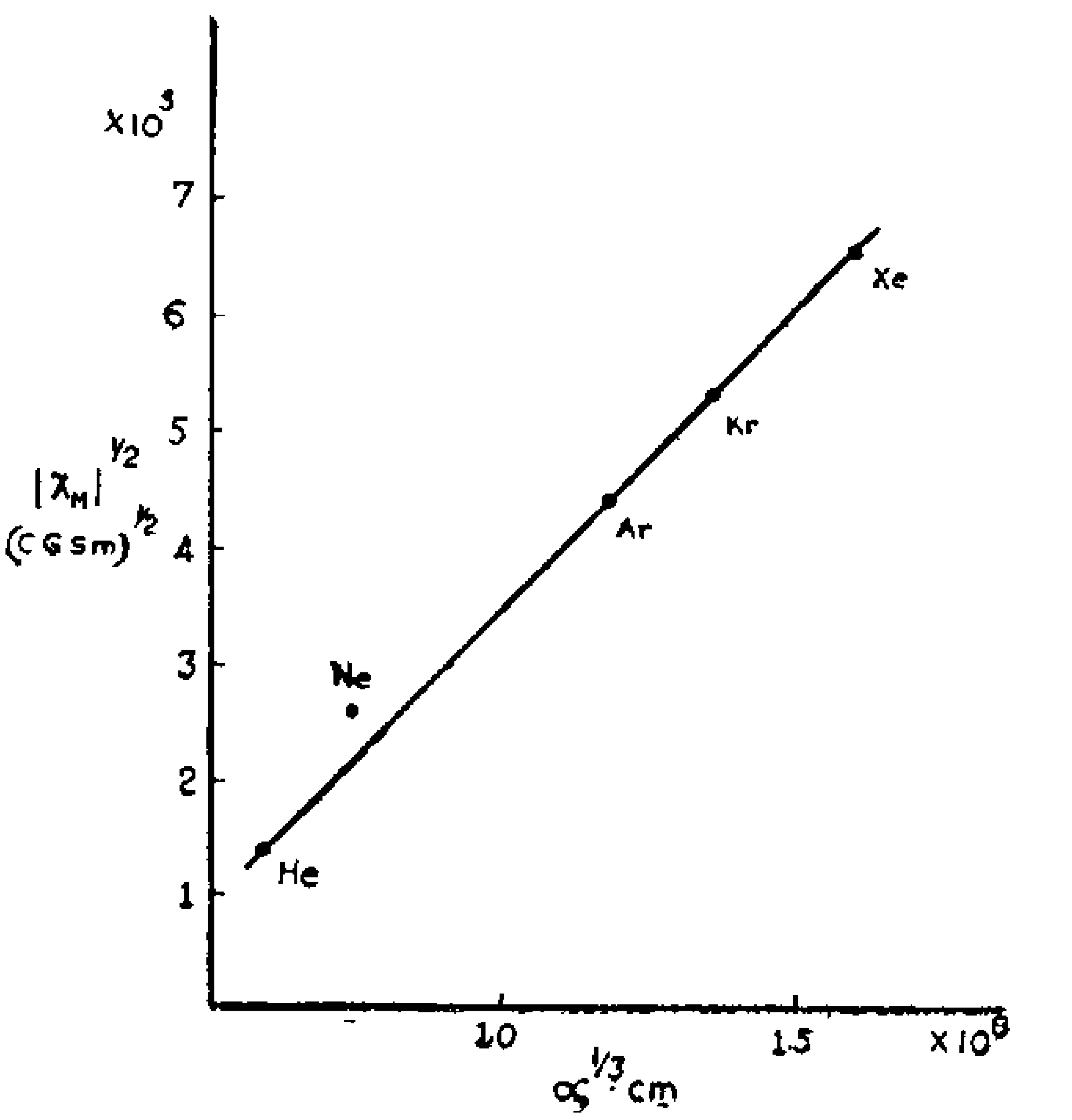

FIG. 1. Graph between square root of susceptibility and cube root of polarizability, for noble gases.

If the experimental value of susceptibility is taken as correct, then the graph suggests a value of 0·55 for the polarizability of neon, which is slightly higher than the present value of 0·40. A general relationship between molar susceptibility and polarizability may be expressed as follows :

$$|\chi_M|^{1/2} = a\,\alpha^{1/3} - b \qquad (3)$$

The constants a and b have numerical values 5·12 and 1·63 respectively when χ is in 10^{-6} cgsm units and α is expressed in units of 10^{-24} cm^3. This simple relationship and the graph given above are good indications of the common size effect of the extranuclear electron cloud that underlie both magnetostatic and electrostatic phenomena, *viz.*, diamagnetic susceptibility and electronic polarizability.

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Cochin 682 022, *October* 6, 1975.

1. Weast, R. C., (ed.), *Hand-Book of Chemistry and Physics*, (55th edition), C. R. C. Press, Inc., Cleveland, 1974.
2. Rao. C. N. R., George, M. V., Mahanthy, J. and Narasimhan, P. T., *A Hand-Book of Chemistry and Physics*, Affiliated East-West Press, Pvt, Ltd., New Delhi, 1967.

FATTY ACID COMPOSITION OF TRIGLYCERIDES OF *ESCHERICHIA COLI* LIPIDS

Introduction

IT has been reported that *E. coli* phospholipids contain lauric, myristic, palmitic and stearic acids as saturated, palmitoleic and *cis*-vaccenic acids as unsaturated and *cis*-9, 10-methylenehexadecanoic and lactobacillic acids as cyclopropane acids[1-4]. But there is no report about the fatty acid composition of the triglyceride fraction of *E. coli* lipid. This communication deals with the fatty acid composition of *E. coli* triglycerides.

Materials and Methods

E. coli K 12 cells were grown in tryptone-yeast extract medium at 37°, log phase cells were harvested by centrifugation, washed with normal saline and kept at — 22°.

The lipids were extracted from the cells by the procedure of Bligh and Dyer[5] and fractionated on 100–200 mesh silicic acid columns (Mallinkrodt Chemical Works, St. Louis, Missouri) according to Vorbeck and Marinetti[6]. The triglycerides were isolated from the neutral lipid fraction by preparative thin-layer chromatography using the solvent system containing petroleum ether (40–60°), diethyl ether, acetic acid (80 : 20 : 1·5, v/v). The band having the same R_f as triolein was isolated and confirmed as triglyceride by pancreatic lypase hydrolysis[7] to yield 2-monoglycerides and free fatty acids.

Methyl esters of the component fatty acids were prepared directly from the triglycerides by methanolysis as described by Luddy *et al*[8]. The methyl esters were analysed by vas-liquid chromatography (GLC). An "F and M Model 700-R" dual column analytical gas chromatograph was used for this purpose. Two 6 ft. × 0·25 in. columns one of 5% diethylene glycol succinate polyester (DEGS) and the other of 5% silicone gum rubber (SE 30) both on 60–80 mesh Gas-chrom Z (Applied Science Laboratories, State College, Pa.) were used. The former column was kept at 150° and the latter at 200° during operation.

The fatty acids were identified by comparing their retention times with those of authentic methyl esters and by chainlength determination according to Ackmann *et al.*[9], before and after hydrogenation. The position of double bonds in the mono-unsaturated fatty acids was determined by the permanganate periodate oxidation method of Von Rudloff as adopted to microscale by Scheuerbrandt and Bloch[10] followed by GLC identification of the resulting mono and dicarboxylic acids. The presence of cyclopropane fatty acids was confirmed according to Kaneshiro and Marr[11].

Results and Discussion

The triglycerides contained the following percentages of fatty acids; lauric (2·4), myristic (6·4), pentadecanoic (8·0), palmitic (22·8-, stearic (trace), palmitoleic (9·6), *cis*-vaccenic (25·6), *cis*-9, 10-methylene hexadecanoic (10·8) and lactobacillic (14·4). All these fatty acids have previously been reported to be present in *E. coli* phospholipids[1-4]. Several workers reported the 15-carbon acid to be a cyclopropane fatty acid[3] but during our investigation it was proved to be a straight chain, saturated fatty acid because it did not change its position on GLC on drastic hydrogenetion according to Kaneshiro and Marr[11].

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1. Bishop. D. G. and Work, E., *Biochem. J.*, 1965, 96, 567.
2. Kanemasa, Y., Akamatsu, Y. and Najima, S., *Biochim. Biophys. Acta*, 1967, 144, 382.
3. Cronman, J. E., Jr., *J. Bacteriol.*, 1968, 95, 2054.
4. Chattopadhyay, P. K. and Dutta, J., *Lipids*, 1975, 10, 497.
5. Bligh, E. G. and Dyer, W. J., *Can. J. Biochem. Physiol.*, 1959, 37, 911.
6 Vorbeck, M. L. and Marinetti, G. V., *J. Lipid. Res.*, 1965, 6, 3.
7. Mattson, F. H. and Volpenhein, R. A, *Ibid.*, 1961, 2, 58.
8 Luddy, F. E., Bardford, R. A., Herb, S. F. and Magidman, P., *JAOCS*, 1968, 45 549.
9. Ackman, R. G. and Burgher, R. D, *Ibid.*, 1965, 42, 38.
10. Scheuerbrandt, G. and Bloch, K., *J. Biol. Chem.*, 1962, 237, 2064.
11. Kaneshiro, T. and Marr, A. G., *Ibid.*, 1961, 236, 2615.

NOTE ON THE EVOLUTION OF PHYTOKARST TOPOGRAPHY IN THE GREAT LIMESTONE FORMATION OF JAMMU PROVINCE, J AND K STATE, INDIA

THE present note records for the first time the evolution of phytokarst (Folk R. L., *et al.*[4], 1973) topography in the Great Limestone formation of Jammu Province, J and K State. This peculiar landscape has been formed by subaerial endolithic algae, as a result the formation has been coated black with jagged pinnacles marked by an excellent delicate lacy dissection which do not exhibit any orientation. The phytokarst features have been noticed while making a sedimentological studies of the rock units between Muttal (Lat. 32° 59′ N: Long. 75° 01′ 30″ E) and Salal (Lat. 33° 10′ N; Long 74° 50′ E) (Figs. 1 and 2). The area lies

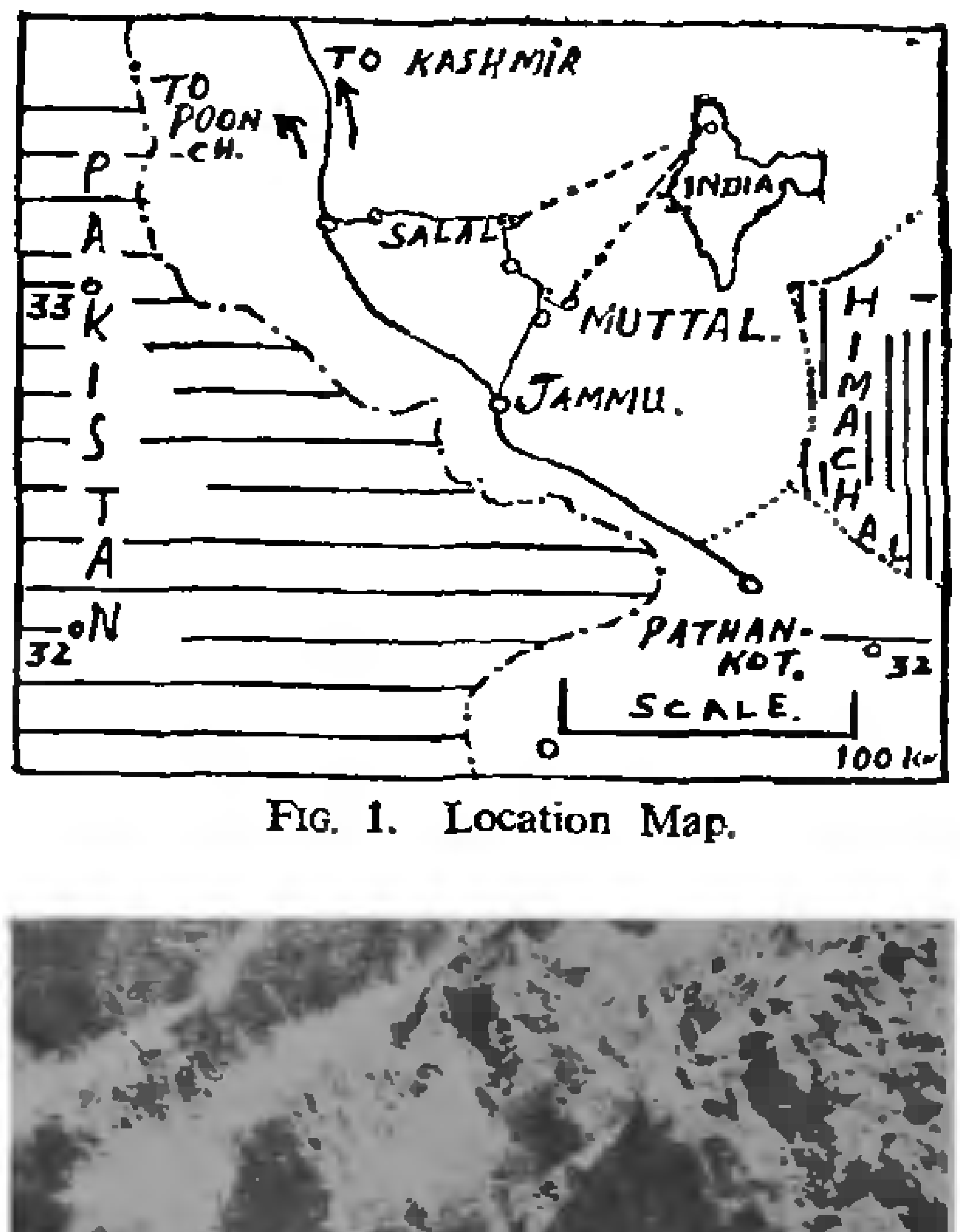

FIG. 1. Location Map.

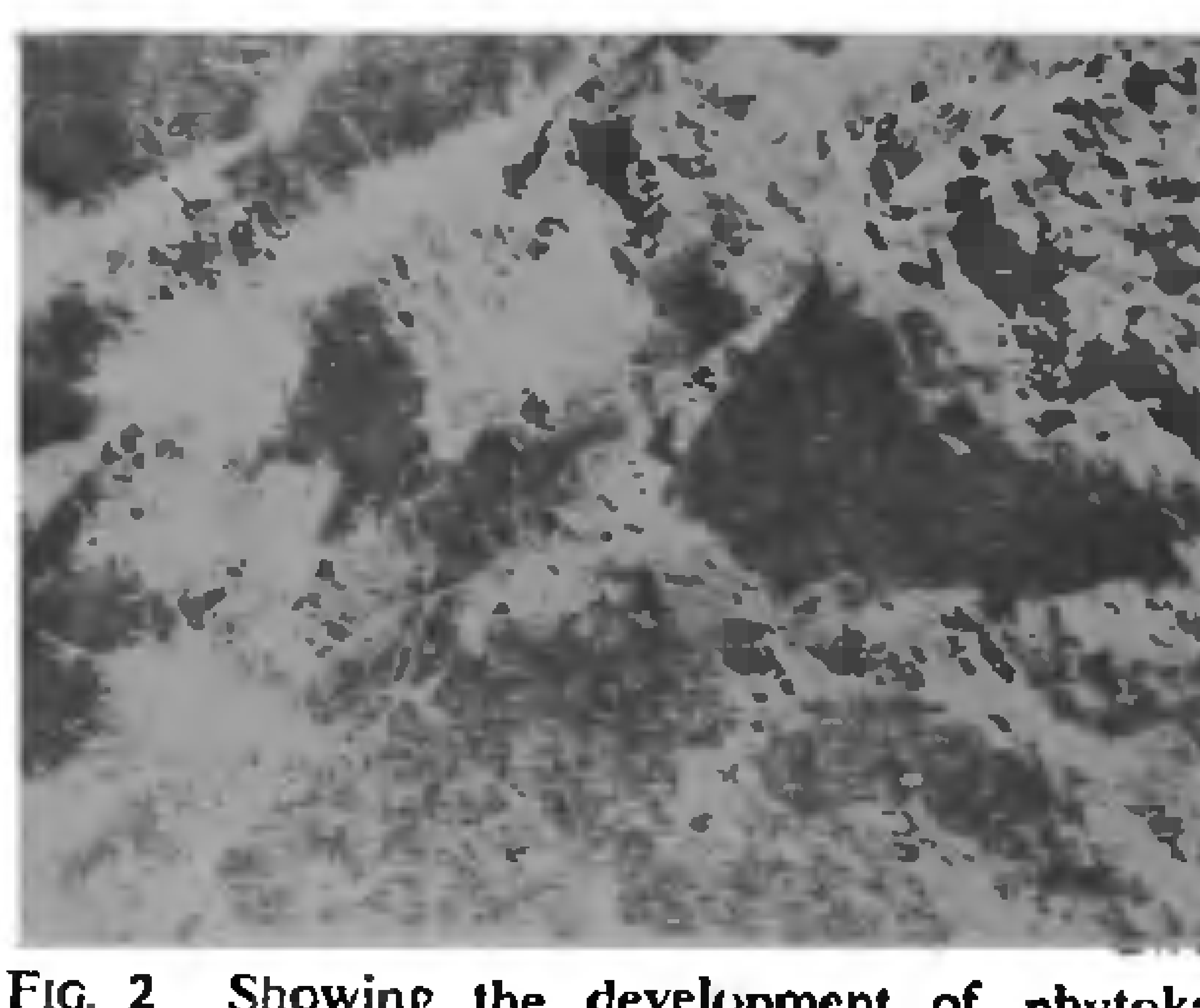

FIG. 2. Showing the development of phytokarst on the Limestone rocks.