PROF. COLWELL and Mr. Friend[1] state that from results of experiments conducted by them they have been led to believe that, besides the usual *E* and *F* regions of the ionosphere, there is a third region—the *D* region—at a height of 5–55 km. They further say: "Such a layer has been postulated before as an absorption layer in the ozone region, but its reflecting powers have not been emphasised".

I would like to point out in this connexion that the formation, during daytime, of a region of ionisation much lower than, and distinct from, the usual Kennelly-Heaviside region has already been postulated by us, both from the consideration of the weakening and complete disappearance of *E*-echoes on the long wave-length side due to absorption by this region (as compared with that due to penetration on the short wave-length side) and from the evidence of echoes which have been detected by us from an equivalent height of about 55 km.[2,3]. These points, as well as the condition under which reflection may take place from such low heights, have been amplified and discussed by Mr. P. Syam, working under my direction[4]. The possible connexion of this ionised region with the ozonosphere—though this latter is now known to be at a height much lower than 55 km.—has also been mentioned. I may also add that Mr. J. N. Bhar, working in my laboratory at Calcutta, has recently reported having observed echoes from heights much below 55 km.

Prof. Colwell and Mr. Friend believe they have obtained echoes from well within the tropospheric regions. It is doubtful if such echoes, if they were observed, were due to the same mechanism as envisaged by the Eccles-Larmor theory. At such heights the collisional frequency is very high, and, for the wave frequency employed by these authors, an enormous electron concentration is necessary to bring down the effective dielectric constant to a zero value. Such high degree of ionisation, if it existed, could scarcely have been missed by those who carry out direct observations in these regions by aeroplanes or balloons.

It should be noted here that, according to English workers, the weakening of *E*-echoes, during daytime, is due to absorption in a non-deviating region (as distinguished from the deviating region of maximum electronic density at a higher level) of the Kennelly-Heaviside layer[5]. The ionised region postulated by us at a much lower height—which under suitable conditions reflects radio-waves—is distinct from this region. To avoid confusion I propose that this new region of ionisation be called the *C* region.

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London.
May 9.

[1] R. C. Colwell and A. W. Friend, NATURE, **137**, 782 (1936).
[2] S. K. Mitra and P. Syam, NATURE, **135**, 953 (1935).
[3] S. K. Mitra, "Report on the Present State of our Knowledge of the Ionosphere", *Proc. Nat. Inst. Sci. India*, **1**, 131 (1935).
[4] P. Syam, *Ind. J. Phys.*, **10**, 13 (1936).
[5] F. T. Farmer and J. A. Ratcliffe, *Proc. Roy. Soc.*, A, **151**, 370 (1935).

Technique of the Painting Process in the Brihadesvara Temple at Tanjore

WHILE scientific investigations into the technique of the methods of production of the mural paintings in the Palace of Minos at Knossos, in Pompeii, etc., have been conducted by Noel Heaton[1], Eibner[2], Berger[3], Raehlmann[4] and others, very little has been done in this direction in the East. With the exception of the work on the Ajanta frescoes[5], of which, however, details of investigations are not available, nothing has been done to reconstruct the exact methods of production of ancient paintings in India, and compare them not only with the methods suggested in Indian texts on painting, but also with those adopted in the West in ancient times.

Recently, I had occasion to study the technique of the painting process adopted in the Brihadesvara temple at Tanjore in South India, in connexion with proposals for their conservation. Of the two groups of paintings in this temple, the earlier one is in the Ajanta or the 'classical' style of Indian art, and is important, since it is the only perfect specimen extant in India of the Hindu art of classical painting.

The paintings are executed on the walls of the dark passage surrounding the main shrine of the temple. The walls are built of large blocks of hornblende-gneiss and over them has been spread the lime plaster for the beautiful 'classical' paintings dating from about the twelfth century A.D., and belonging to the Chola period of Indian history. Over this, and completely covering it, is another loosely bound layer of paintings of about the seventeenth century A.D., which was executed during the days of the Nayaks of Tanjore. The latter group of paintings is cruder than the Chola group in technique and style and forms a type of 'folk' art.

The technique adopted in the execution of these paintings is fresco, no binding material having been used with the pigments. It represents a continuation of the older painting processes in India. From the different samples of painted stuccoes examined so far, the Chola paintings are in *fresco-buono* technique and the Nayak in *fresco-secco* technique. The stuccoes are almost alike in both these cases. They are composed of the *Rinzaffo*, a first rough coat of lime plaster, followed by the *Intonaco*, a second coat of fine lime plaster with pigments thereon. Their approximate thicknesses are given in the accompanying table:

Thicknesses of the Different Layers in the Stuccoes

	Chola	Nayak
Entire stucco	2·64 mm.	2·35 mm.–3 mm.
Rinzaffo	1·84 mm.	1·52 mm.–2·17 mm.
Intonaco	0·67 mm.	0·63 mm.

The results of analyses of the Chola and the Nayak stuccoes are as follows:

	Chola stucco		Nayak stucco	
	Rinzaffo	Intonaco	Rinzaffo	Intonaco
	Per cent	Per cent	Per cent	Per cent
Moisture	0·38	0·23	3·14	3·77
Silica, SiO_2	49·97	7·02	63·39	13·76
Iron and Alumina, $Fe_2O_3 + Al_2O_3$	1·89	1·06	3·69	1·59
Carbon Dioxide, CO_2	18·05	25·13	9·38	23·67
Sulphuric anhydride, SO_3	0·26	0·58	0·17	0·59
Magnesia, MgO	0·51	0·37	0·33	1·02
Lime, CaO	27·88	65·59	18·56	55·58
Undetermined (mostly alkalis)	1·05	*nil*	1·34	*nil*
	99·99	99·98	100·00	99·98

Except sand, nothing has been used as an inert material along with the lime.

So far as the pigments are concerned, lime has been used for the white; carbon for black; red, yellow and brown ochres as red, yellow and brown pigments;