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**LETTERS TO THE EDITOR**


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**DAYTIME IONOSPHERIC DRIFT  
MEASUREMENTS DURING SPORADIC E  
OVER AHMEDABAD**

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A LONG series of ionospheric *E*-region drift measurements during daytime hours was conducted at Ahmedabad during the years 1970-75, employing spaced receiver technique of Mitra<sup>4</sup>. The results on the seasonal and daily variations have been reported earlier<sup>2,3</sup> which show seasonal reversal in the zonal (E-W) component, being westward during winter and eastward during summer. These results were for the combined *E* and *E<sub>s</sub>* reflections. In the present

communication we present results of a study where we have separated the *E* layer reflections and *E<sub>s</sub>* reflections based on the ionosonde observations at Ahmedabad and daily variation during winter and summer seasons computed separately for *E* layer and *E<sub>s</sub>*. The average daily variations are shown in Fig. 1. The average hourly values of the eastward drift vary between 20 m/s to 40 m/s directed towards west for *E* layer echoes during winter season. The values for *E<sub>s</sub>* echoes however vary between zero to 20 m/s directed towards west. Thus on the average a difference of 20 m/s to 30 m/s is noted for almost all hours, the values for *E<sub>s</sub>* echoes being less in magnitude and directed towards west. During summer the eastward component for *E* layer echoes varies between zero to 20 m/s directed towards east. For *E<sub>s</sub>* echoes the values vary between 20 m/s to 30 m/s directed towards east. Thus, there is again a change of about zero to 20 m/s in the average hourly values of eastward component noticed. The values being more in magnitude and directed towards east for *E<sub>s</sub>* echoes than for the *E* layer echoes. Thus a consistent shift of the zonal component is clear towards eastward wherever *E<sub>s</sub>* layer is present. This implies that an eastward drift is more favourable for the generation of *E<sub>s</sub>*.

July 5, 1980.

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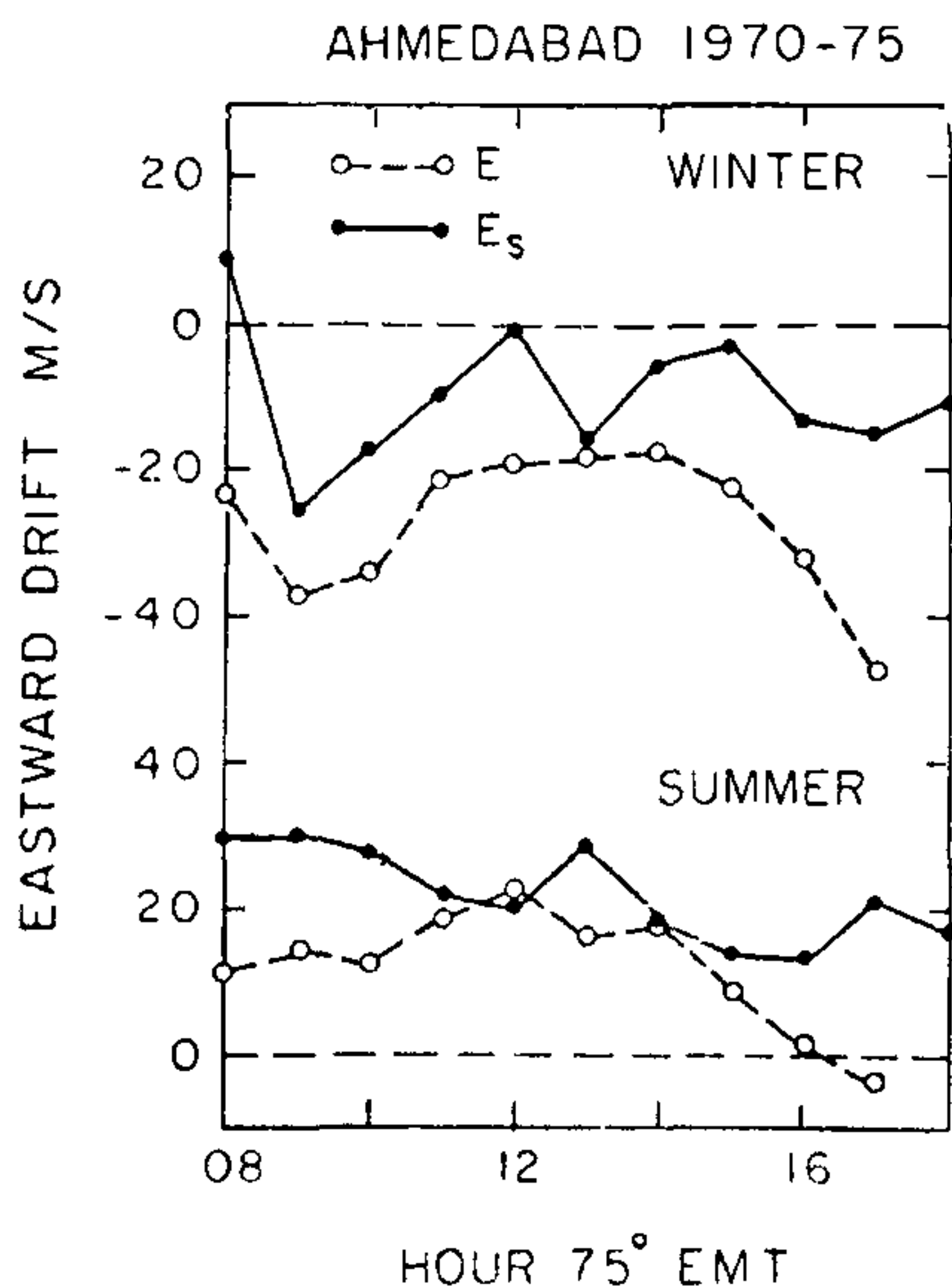


FIG. 1. Average daily variation of the eastward drift shown separately for *E* layer echoes and *E<sub>s</sub>* echoes recorded at Ahmedabad for winter and summer seasons.

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**ABSENCE OF LIPOPROTEINS  
IN SERUM OF GOLDEN HAMSTER  
*MESOCRICETUS AURATUS***

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While studying the serum biochemistry of hamsters, we came across a strange finding that lipoproteins are totally missing in hamster serum. In other species

e.g., *Rattus rattus* from the same order rodentia, many references are available regarding serum lipoprotein values, but to the authors' knowledge, no mention anywhere has been made regarding these values in hamster serum.

In our laboratory, hamster serum was analysed for lipoproteins by agarose-gel electrophoresis method as suggested by Pathak and Hegiste<sup>1</sup>. All the chemicals used were of A.R. grade. Agarose was obtained from Sisco Research Laboratories Pvt. Ltd., Bombay, India.

Using these chemicals and the method, the values obtained for lipoproteins in human and rat serum were within the normal range.

Thus we are inclined to conclude that hamster serum does not contain lipoproteins.

These findings indicate that in hamsters, lipid transport mechanisms need investigation.

August 8, 1980.

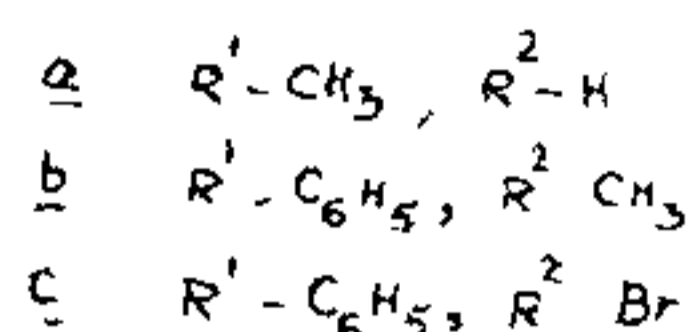
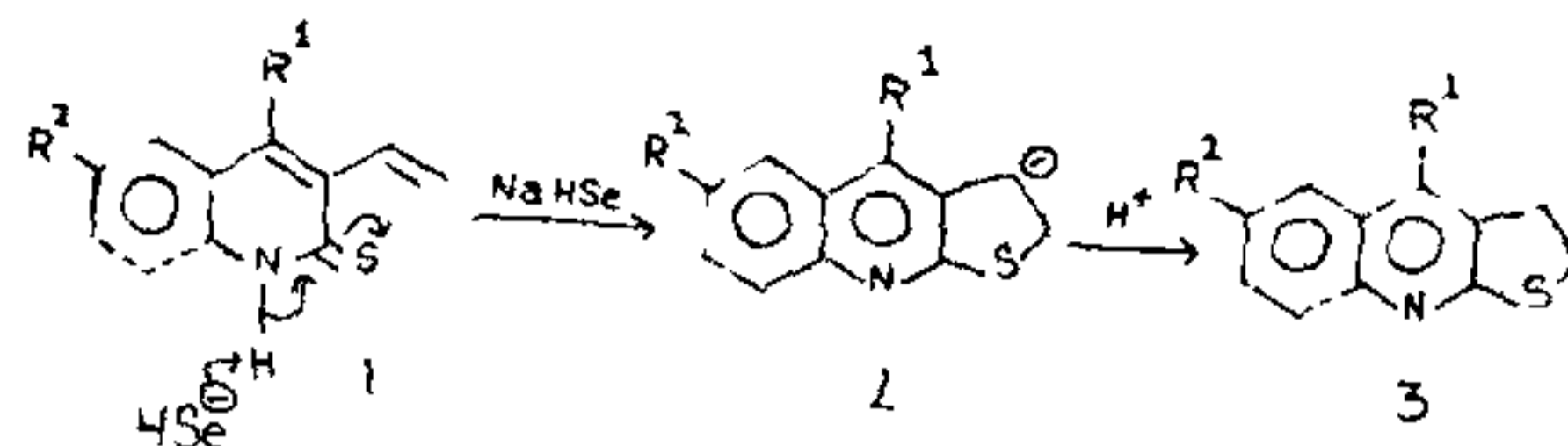
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## A NOVEL CYCLISATION BY SODIUM HYDROGEN SELENIDE—SYNTHESIS OF 2,3-DIHYDROTHIENO(2,3-*b*)QUINOLINES

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In our earlier communications<sup>1,2</sup>, we have reported how 2-chloro-3-vinylquinolines on reaction with sodium hydrogen selenide and sodium diselenide led to the serendipitous synthesis of 1,2-diselenolo (3,4-*b*) quinolines and selenolo (2,3-*b*) quinolines respectively. The cyclisations involved in the above conversions are of considerable interest in organoselenium chemistry. This prompted us to explore whether the interaction of sodium hydrogen selenide and 3-vinylquinolin-2(1H)-thione would lead to the synthesis of 1,2-thiaselenolo (3,4-*b*) quinoline system. Accordingly 3-vinylquinolin-2(1H)-thione (1a),<sup>3</sup> refluxed with NaHSe in ethanol, furnished a product (m.p. 168–172°C, yield 54%) insoluble in sodium hydroxide indicating the absence of free thioxo group. Its IR spectrum showed the absence of the vinyl, NH, and thioxo groups. The NMR(CDCl<sub>3</sub>) spectrum exhibited in addition to phenyl (at δ 7.45–8.00, *m*, 4H) and C<sub>4</sub>-methyl (at δ 2.50, *s*, 3H) protons, a four proton singlet (at δ 3.45,



*s*, 4H) only. It is interesting to note in the NMR signals that the NH and ABX pattern<sup>3</sup> of three doublets of doublet for vinylic protons were absent. The NMR spectrum on the other hand was found to be identical with that of 2,3-dihydro-4-methylthieno (2,3-*b*)quinoline and this fact was further corroborated by mixed m.p. and superimposable IR spectrum with authentic sample<sup>3</sup>.

Although the desired objective of obtaining 1,2-thiaselenolo (3,4-*b*) quinoline could not be achieved, the facile cyclisation effected by NaHSe is of interest in organoselenium chemistry. The ring closure of quinolinethione (1a) to dihydrothienoquinoline (3a) can be construed as proceeding through nucleophilic addition of the intermediate thiolate ion to the terminal carbon atom of the vinyl group and protonation of the resulting carbanion (2a). The abstraction of proton from the NH group which is precursory to the thiolate ion formation should have been accomplished by the hydrogen selenide anion, for it is a potential nucleophile. It is relevant to mention that our efforts to bring about the above cyclisation with sodium hydrogen sulfide in boiling ethanol proved futile. The extension of this method to quinolinethione (1b)<sup>4</sup> and (1c)<sup>4</sup> also furnished the corresponding dihydrothienoquinolines (3b), m.p. 116–117°C, yield 45%, NMR (CDCl<sub>3</sub>); δ 2.35, *s*, 3H, CH<sub>3</sub>; δ 3.03–3.50, *m*, 4H, -CH<sub>2</sub>-CH<sub>2</sub>-; δ 7.13–7.85, *m*, 8H, Ar-H; and (3c), m.p. 166–167°C, yield 56%, NMR (CDCl<sub>3</sub>); δ 3.07–4.53, *m*, 4H, -CH<sub>2</sub>-CH<sub>2</sub>-; δ 7.25–8.00, *m*, 8H, Ar-H respectively.

All melting points are uncorrected. Satisfactory elemental analyses were obtained for all compounds.

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