

Letters To The Editor

551-553-21 : 551-555(548)

ON THE STRONG MONSOON WINDS AT NAGERCOIL

1. Introduction

It is usually seen that the upper winds at Nagercoil are relatively stronger than those of Trivandrum or Minicoy during the southwest monsoon period. Nagercoil (112 ft a.s.l.) is located almost at the tip of the Peninsula at a distance of 10 to 15 miles to the south of the range of the Western Ghats (Fig. 1). Trivandrum (250 ft a.s.l.) is situated on the west coast about 40 miles north of Nagercoil and about 10 miles west of the Ghats. The topography of both these places is rugged and the land surface is covered densely by coconut and areca palms. Minicoy is a small island of plane land in the Arabian Sea, about 7 square miles in area, situated about 250 miles west of Trivandrum. In order to obtain a quantitative idea of the strength of the upper winds at these places, the morning pilot balloon winds at these places have been analysed for the period June to September 1947-51. The morning winds have been chosen for the purpose as they would be uninfluenced by the effects of insolation.

2. Results

The mean wind directions and velocities at Nagercoil, Minicoy and Trivandrum during the period of study at 1, 2, 3, 5, 7, 10, 15 and 20 thousand feet are shown in Table 1.

It would facilitate a ready comparison of the wind velocities at the different places at various levels if the ratios of wind velocities for each level at Minicoy and Trivandrum to the corresponding one at Nagercoil are worked out. Data so computed are shown in Table 2.

3. Discussion

It is seen from the above tables that the Nagercoil winds are stronger than those at Minicoy and Trivandrum at all levels upto 7000 ft whereafter they are all of about the

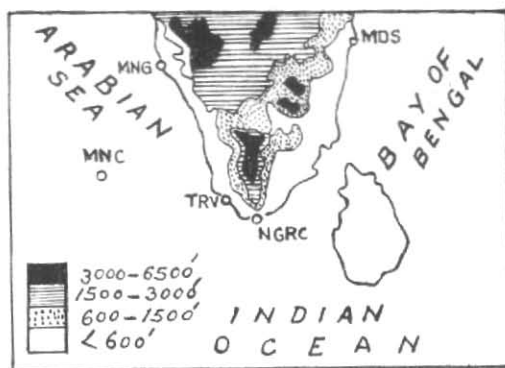


Fig. 1. Orography

same order of magnitude except the Trivandrum wind at 15,000 ft. It is also noticed that there is no evidence of any southerly component in the winds in the lower levels of any of these three stations. The Nagercoil winds are markedly stronger than those at Trivandrum and Minicoy in the frictional layer upto 3000 ft and the winds at Trivandrum and Minicoy are of the same order of magnitude.

The question of the influence of the Indian mountain ranges on the air motion in the lower levels of the atmosphere has been discussed in detail by Banerji (1930), from the point of view of the configuration of the isobars and streamlines. He has shown that the motion of the air near the Ghats is highly turbulent in character. He has also shown that the stream lines orient themselves in the NW-SE direction. The wind velocity in the lower levels would consequently be reduced below the gradient winds at Trivandrum. Such frictional effects can result in considerable reduction in the wind speed even upto thrice the height of the hills, as shown by Rao and Raghavan (1950), in their study on the influence of the hills at the Vizagapatam airfield on the upper winds in the lower levels there. As Nagercoil is situated about 10 to 15 miles south of the range of the

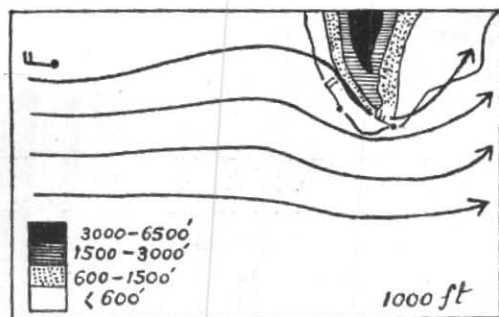


Fig. 2(a)

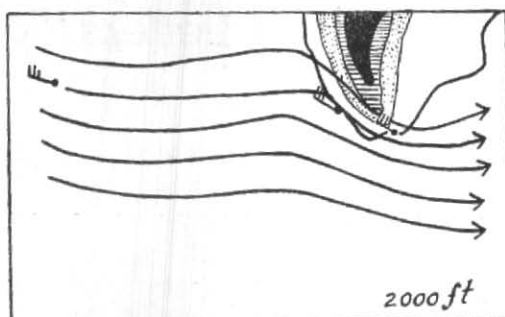


Fig. 2(b)

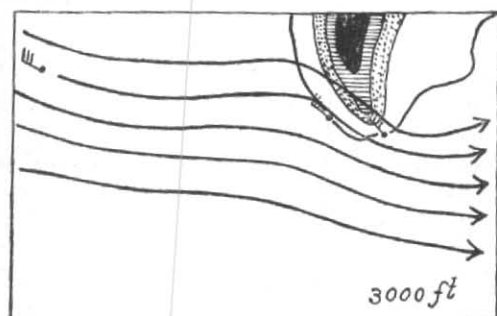


Fig. 2(c)

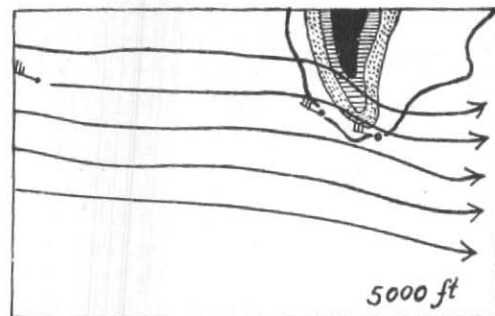


Fig. 2(d)

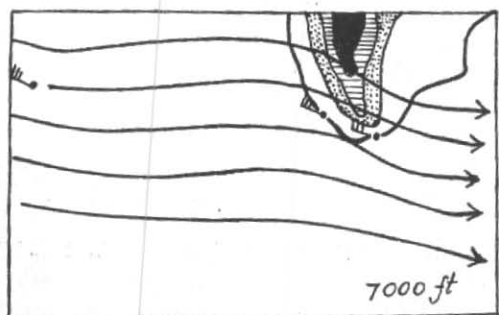


Fig. 2(e)

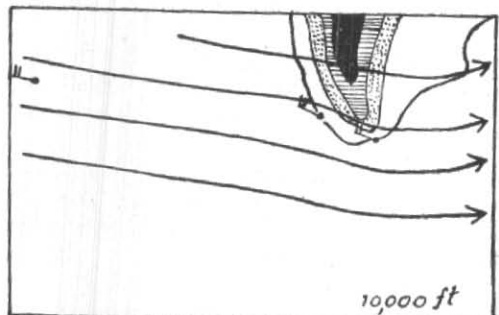


Fig. 2(f)

Fig. 2. Stream line flow of winds in the southwest corner of the peninsula during the southwest monsoon

TABLE 1
Mean wind directions and speeds (knots) at Trivandrum, Nagercoil and Minicoy
during June-September 1947-51

	Height in thousands of feet a.s.l.															
	1		2		3		5		7		10		15		20	
	Dir.	Speed	Dir.	Speed	Dir.	Speed	Dir.	Speed	Dir.	Speed	Dir.	Speed	Dir.	Speed	Dir.	Speed
Nagercoil	295	26	295	36	295	37	290	32	285	29	285	18	265	10	115	05
Minicoy	280	19	285	24	290	28	290	27	290	26	280	18	265	10	150	06
Trivandrum	325	18	305	24	300	27	300	27	295	25	290	20	250	08	155	07

TABLE 2
Ratios of wind velocities at Nagercoil to those at Minicoy and Trivandrum at different levels

Ratios of winds at Nagercoil to those at	Height in thousands of feet a.s.l.								
	1	2	3	5	7	10	15	20	
Minicoy	1.4	1.5	1.3	1.2	1.1	1.0	1.0	0.8	
Trivandrum	1.4	1.5	1.4	1.2	1.2	0.9	1.3	0.8	

Western Ghats, frictional effects due to the Ghats are of less importance there than at Trivandrum or Minicoy. Further, the stream diverted along the Ghats southwards, would flow past Nagercoil after reaching the end of the boundary of Ghats (Fig.2). The net effect is of increased wind strength at Nagercoil compared with that at either Trivandrum or Minicoy in the lower layers of the atmosphere.

That the orography and the consequent deflection of the stream line is the main cause or the increased wind speed at Nagercoil is also supported by the fact that the upper

winds at Minicoy, Nagercoil and Trivandrum above 7000 ft are about the same order of magnitude.

K. RAGHAVAN

*Meteorological Office,
New Delhi
January 28, 1955.*

REFERENCES

- Banerji, S. K. 1930 *Indian J. Phys.*, 5, Pt. 7, p. 699.
Rao, D. V. and Raghavan, K. 1950 *Curr. Sci.*, 19, p. 117.