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FLUCTUATIONS OF ANNUAL RAINFALL IN CENTRAL INDIA (1872-1947)

In a memoir (Vol. 3, Part 1) of the India Meteorological Department published in 1910, Sir Gilbert T. Walker examined the rainfall data for India and came to the conclusion that although there was no proof of any permanent climatic change, there had been a tendency over Northwest* and Central† India for the rainfall to fluctuate. This conclusion was based on the rainfall data of about 40 years upto the year 1908 available at that time. There have, however, been suggestions and conjectures since then that the climate of Central India has been changing. With a view to ascertain whether these suggestions are supported by recent meteorological evidence, the annual rainfall data for Central India for the period 1872 to 1947 have been studied and the results are given in the present note.

Year to year fluctuations — The year to year rainfall figures for Central India are shown graphically in Fig. 1. The graph shows that wet and dry years have alternated irregularly. The period from 1881 to 1894 may be said to be somewhat like a wet period. This was followed by a dry period and during the 27 years 1895 to 1921, 22 years had rainfall less than the average. Subsequently a definite wet period set in. There has been an appreciable increase in rainfall during the period 1922-1947 and the only years which can be regarded as deficient in this run of years are 1925, 1929 and 1941. The two driest years were 1899 and 1918 which occurred in the dry period with an annual rainfall of 23″·45 and 23″·08 respectively while the wettest year was 1934 which occurred in the wet period with an annual rainfall of 58″·74, *i.e.*, 144 per cent of the average for 1872-1947. The range of difference between the driest and the wettest years is 25″·66.

10-Year means — As the fluctuation of rainfall from year to year is generally irregular, the data have been smoothed by taking running ten-year means which have been shown in Fig. 2. The curve in Fig. 2 indicates that there was a maximum of rainfall focussing around 1884-1885. This was followed by a gradual decrease of rainfall to a trough in 1895-1905 and then a gradual rise began culminating in the present wet conditions. The past few years have been noteworthy wet years with rainfall appreciably above the average. Values of decadal means were also worked out and are given in Table 1. These show that the first two decades had rainfall above the average, the next two decades were less than the average and were followed by two decades which were above the average again.

* Most of this area is now in Pakistan

† Comprising of Madhya Bharat, Vindhya Pradesh and Bhopal States

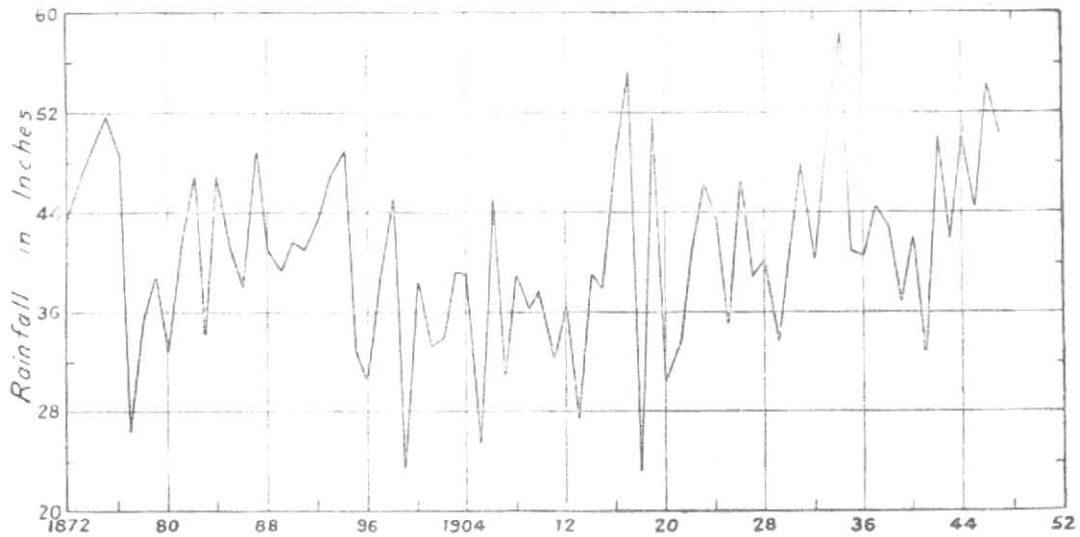

Fig. 1

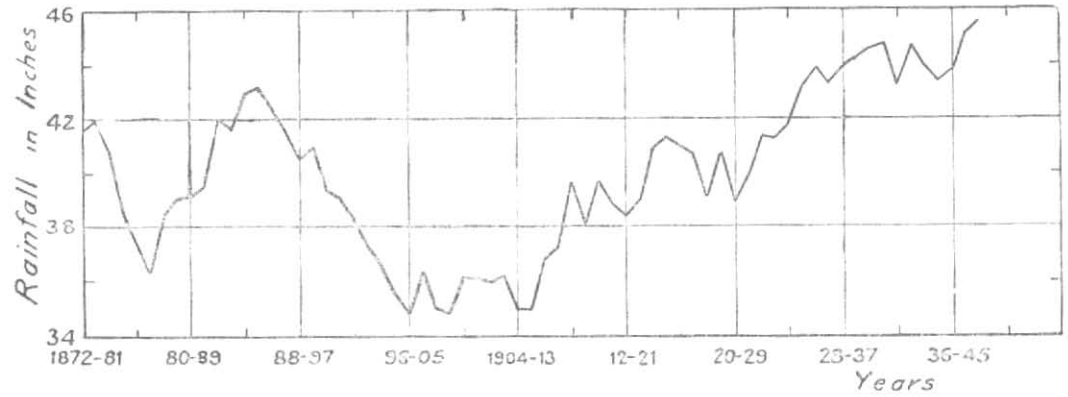

Fig. 2

TABLE 1

Annual Rainfall in Central India—Decadal Means

Period (10 years)	Central India (West)	Central India (East)	Central India (whole)
	(inches)	(inches)	(inches)
1872-1881 ..	38·62	45·79	41·58
1882-1891 ..	36·76	50·01	42·04
1892-1901 ..	33·39	45·45	38·24
1902-1911 ..	32·32	40·59	36·03
1912-1921 ..	34·16	44·94	38·47
1922-1931 ..	36·15	49·38	41·44
1932-1941 ..	41·29	46·02	43·18

Conclusions — The data appear to lead to the following inferences about the annual rainfall over Central India—

(*i*) The annual rainfall data for 1872-1947 do not suggest that there has been a permanent climatic change in Central India.

(*ii*) There have been fluctuations in the annual rainfall over the area and each period, dry or wet, covers several consecutive years; the number of such consecutive years of dry and wet periods are variable.

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