

BASED ON METEOROLOGICAL DATA, THE CURRENT CLIMATE OF UZBEKISTAN AND CHANGES IN IT

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Annotation

It is very important to identify the climate changes currently observed all over the world. To do this, it is important to know what is the climate that was initially happening in the Republic of Uzbekistan and now. Knowing this, we are greatly helped by the air temperature and the annual fat content. If we can evaluate what the current climate is like, scientifically, mathematically, statistically, it can help us a lot in terms of climate changes that occur in the coming years and forecasting them.

Keywords: Uzbekistan, Republic, meteorological station, annual precipitation, average perennial air temperature, average perennial precipitation, period, climate, land, atmosphere, air temperature, land, weather, heat, warming, months, years, climate change.

Introduction

What is the climate in the Republic of Uzbekistan that is currently taking place and the changes that are taking place in it are determined by the average air temperature and the amount of oil per year, taken from the 7 meteorological stations in the Republic, data from more than 100 years in each station are taken based on what the air temperature is now, compared The annual fat content is. 1887-1960, 1887-1980, 1927-2010, 1946-1975, 1971-2000, 1976-2010, 1992-2022- calculated for periods. The average air temperature was also taken for these years. In addition, the most ancient stations in the Republic of Uzbekistan were selected in this research work. Based on the complete continuity of data between them and mathematical, statistical, stochastic and other scientific methodical methods, it is considered important to make various conclusions and recommendations on how climate changes are changing.

In the implementation of this specified task, we have considered the data obtained from seven meteorological stations at different points of the Republic. In the competition, we selected the oldest ones in the year of the station's founding. These are: Tashkent Observatory, Termez, Samarkand, Nukus, Namangan, Navoiy, Andijan meteorological stations. From these station, we take and reproduce the data of the average air temperatures and the annual amount of fat, identifying and analyzing the changes in them is one of the current requirements.

Table of perennial average air temperatures calculated for different periods at Tashkent Observatory. Table 1.

Months													
Period	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Yil
1887-1960	-0.9	2.0	7.6	14.4	20.0	24.7	26.9	24.9	19.4	12.6	6.4	1.6	13.3
1887-1980	0.6	2.5	7.8	14.4	20.0	24.8	26.7	24.7	19.6	13.0	6.8	2.2	13.6
1927-2010	0.6	2.8	8.0	14.3	19.8	24.6	26.8	25.0	20.0	13.9	7.5	2.6	13.8
1946-1975	0.5	2.9	7.8	14.5	20.5	24.8	25.6	24.1	19.9	14	7.7	2.1	13.7
1971-2000	0.9	2.5	8.3	15.6	20.2	25.7	27.8	25.8	20.3	13.6	8.1	3.6	14.4
1976-2010	1.9	3.9	8.7	14.9	20.1	24.4	26.8	25.1	20.1	13.7	8.4	3.8	14.3
1992-2022	2.7	4.5	10.0	15.6	21.3	26.0	28.3	26.6	21.2	14.2	8.0	3.5	15.1

What the climate is now, we can say from the table above, is that the average lunar air temperatures for individual periods recorded at the Tashkent Observatory meteorological station, from 1887 to 1960, were -0.9°C for January. In the summer it was 26.9°C in July. The annual air temperature is, while 13.3°C has been observed. January temperature in 1887-1980 was 0.6°C . The average perennial air temperature in July is 26.7°C . The winter average temperature for the period 1927-2010 was 0.6°C , in March 2.5°C , in July 26.6°C . In 1946-1975, it is 0.5°C in January, 7.8°C in April, and 25.6°C in July. The average multi-month air temperature for the 1971-2000 period was 0.9°C in January, 20.2°C in May, and while 25.8°C in August. The temperature for the period 1976-2010 was 20.1°C in September, 13.7°C in October, 8.4°C in November, and 14.3°C in the yearbook. In 1992-2022, the temperature was 2.7°C in January, 28.3°C in July, and 3.5°C in December. The average perennial air temperature was 15.1°C . For the period 1887-1960 and the period 1887-1980, the air temperature in January increased by 0.8°C , while in summer in July their difference is 0.2°C . The annual value is 0.3°C . For the periods 1927-2010 and 1946-1975, the difference in winter increased to 0.1°C , and in July to 1.2°C . The anniversary was 0.1°C . For the 1971-2000 and 1976-2010 periods, the January difference had increased to 1.0°C . July also had a difference of 1.0°C . While the total annual value can be seen to increase by 0.1°C . The difference between 1976-2010 and 1992-2022 was 0.8°C in January and 1.5°C in July. And the difference between the annual average values increased by 0.8°C . The average perennial air temperatures cited for the different periods in the table indicate that the climate of our present day is rising rhythmically than in the previous Old years. The modern climate is as dry

and hot as its predecessors. This increase is especially evident in the last 30 years and it can be seen from this value that it has gone much higher.

Table of perennial average air temperatures calculated for different periods at Termez meteorological station. Table 2.

Months													
Period	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Yil
1900-1960	2.1	5.8	11.4	18.2	24.5	28.3	30.7	28.7	22.8	16.1	10.1	5.0	17.0
1900-1980	3.1	5.6	11.1	18.2	24.0	28.7	31.0	29.2	22.9	15.8	10.1	5.2	17.1
1927-2010	4.8	7.6	13.2	19.2	24.9	28.6	29.7	28.5	22.2	16.0	10.9	5.9	17.6
1946-1975	4.2	5.9	11.3	17.6	24.2	28.2	29.3	26.5	21.2	15.2	8.7	4.4	16.4
1971-2000	3.5	5.6	11.2	18.9	24.2	28.9	30.3	27.9	22.4	16.2	10.7	6.7	17.2
1976-2010	3.7	6.0	11.8	19.0	24.6	28.8	30.5	28.2	22.4	16.1	10.9	6.8	17.4
1992-2022	4.0	7.2	13.0	20.2	25.1	29.0	31.3	28.8	23.1	16.8	11.1	7.0	18.0

The Termez meteorological station had a multi-year average January air temperature of 2.1 °C for the period 1900-1960. 5.8 °C in February, 11.4 °C in March, 18.2 °C in April, 24.5 °C in May, 28.3 °C in June, 30 °C in July, 28.7 °C in August, 22.8 °C in September, 16.1 °C in October, 10.1 °C in November, 5.0 °C in December. And the anniversary was 17.0 °C, and it can be seen that there was a lower air temperature compared to the rest of the period. For the period 1900-1980, the temperature was 3.1 °C in January and 31.0 °C in July in summer. The anniversary was 17.1 °C. In 1927-2010, the temperature was 4.8 °C in January, 29.7 °C in July, and the yearbook was 17.6 °C. For the period 1946-1975, the air temperature was 4.2 °C in January, 29.3 °C in July, and the annual value was 16.4 °C. For the 1971-2000 period, it was 3.5 °C in January, 30.3 °C in July, and the anniversary was 17.2 °C. For the 1976-2010 period, January was 3.7 °C, July was 30.5 °C, anniversary was 17.4 °C gat was the most. In the period 1992-2022, it was 4.0 °C in January, 31.3 °C in July, and 18.0 °C in the year. For the periods 1900-1960 and 1900-1980, the difference in perennial average air temperatures is 0.1 °C gat eng. The perennial average air temperature difference of the periods 1927-2010, 1946-1975 is 0.8 °C gat eng. In the periods 1971-2000 and 1976-2010 it was 0.2 °C. The difference between them in 1976-2010 and 1992-2022 will be 0.6 °C founded. The lowest temperature in Termez January was observed in the period 1900-1960, which was 2.1 °C. The upper highest was observed in the period 1927-2010. The coolest summer ever observed at this station was in the period 1946-1975, at 29.3 °C. The hottest summer of our current period is 31.3 °C in the period 1992-2022. So we can say that in modern times the trend of air temperatures obtained for individual periods calculated at the Termez station is rising, relying on this 120-year data. Especially in the last 30 years, the current climate warming has high indicators.

Table of perennial average air temperatures calculated for different periods at Samarkand meteorological station. Table 3.

Months													
Period	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Yil
1881-1960	0,3	2,9	7,4	14,2	19,8	24,0	26,0	24,1	19,3	12,7	6,9	2,7	13,4
1881-1980	-0,1	2,1	6,7	13,2	18,4	23,6	25,8	23,6	18,3	11,6	6,0	2,0	12,6
1927-2010	0,5	3,2	7,7	13,8	19,1	24,0	25,8	24,0	18,8	12,4	6,5	2,5	13,2
1946-1975	0,9	3,0	7,6	13,4	19,2	23,8	25,7	24,8	18,5	11,8	5,8	1,9	13,0
1971-2000	0,8	2,3	7,4	14,8	19,3	24,6	26,5	24,6	19,7	13,1	7,8	3,7	13,7
1976-2010	1,0	2,6	7,6	14,8	19,6	24,6	26,7	24,5	19,6	13,2	7,9	3,8	13,8
1992-2022	2,5	4,3	9,5	15,8	21,1	26,5	27,8	26,2	21,6	14,5	8,0	3,9	15,1

What is the current climate in Samarkand shows these average perennial air temperatures. Originally in the period 1881-1960, the temperature is 0.3 °C in January, 26.0 °C in July in summer, and 13.4 °C on average for most years. The 1881-1980 in the period showed -0.1 °C in January, 25.8 °C in July, and 12.6 °C for most years. The period 1927-2010 was 0.5 °C in January, 25.8 °C in July, and 13.2 °C in the year. In the period 1946-1975, it is 0.9 °C in January, 25.7 °C in July, and 13.0 °C in the year. It shows 0.8 °C in January, 26.5 °C in July, 13.7 °C in year 1971-2000. For 1976-2010, it was 1.0 °C in January, 26.7 °C in July, and 13.8 °C per annum. And for the period 1992-2022 it was 2.5 °C in January, and 27.8 °C in the summer in July. The difference between the periods 1881-1960 and 1881-1980 is 0.4 °C in January, the difference between the periods 1927-2010 and January 1946-1975 is also 0.4 °C gat eng. The difference between 1971-2000 and January 1976-2010 is 0.2 °C, while the average multi-year difference in January for the periods 1976-2010 and 1992-2022 is 1.5 °C. So, in modern times, the coldest January month at the Samarkand meteorological station was observed -0.1 °C in 1881-1980. The highest winter air temperature was 2.5 °C during the period 1992-2022. The lowest average air temperature in July was 25.8 °C observed in 1881-1980. The warmest summer was observed in the period 1992-2022, when it showed 27.8 °C. A 140-year data analysis at the Samarkand meteorological station shows that the average air temperature is rising and warming, and it has peaked in recent years.

Table of perennial average air temperatures calculated for different periods at the Nukus meteorological station. Table 4.

Months													
Period	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Yil
1874-1960	-6,4	-3,8	3,3	12,7	20,5	25,1	27,1	24,6	18,5	10,2	2,0	-4,0	10,8
1874-1980	-4,9	-3,5	3,9	13,6	21,2	26,0	28,0	24,9	18,8	10,8	2,7	-2,4	11,6
1927-2010	-4,4	-2,8	4,0	13,5	20,9	26,2	28,0	25,4	19,1	11,4	3,1	-2,3	11,8
1946-1975	-4,7	-2,5	3,4	12,8	21,0	25,6	27,1	25,0	18,4	11,4	2,6	-2,8	11,4
1971-2000	-4,6	-3,0	3,8	14,6	21,1	26,8	28,9	26,3	19,7	11,2	3,9	-1,6	12,2
1976-2010	-4,2	-2,2	4,9	14,8	21,5	26,9	29,0	26,7	20,1	11,5	4,0	-1,6	12,6
1992-2022	-4,1	-1,1	6,0	14,9	21,8	26,9	28,6	26,3	21,0	12,1	3,6	-2,2	12,8

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At the Nukus meteorological station in Karakalpakstan, the northern part of our republic, we have calculated and analyzed the average air temperatures of 148 years to find out the climate of our time. According to him, in 1874-1960 in the period, the average multi-month air temperature in on January is -6.4°C , in July 27.1°C , and the average multi-year period is 10.8°C is equivalent to. In the period 1874-1980, it is -4.9°C in January, 28.0°C in July, and 11.6°C for most years. The average January temperature for the 1927-2010 period is -4.4°C , July 28.0°C , and yearbook 11.8°C . It shows -4.7°C in January 1946-1975, 27.1°C in summer, and 11.4°C for most years. In 1971-2000 it was -4.6°C in January, 28.9°C in July, and 12.2°C in the year. The average January temperature for the period 1976-2010 was -4.2°C , and the July temperature was 29.0°C , 12.6°C . In the period 1992-2022, it showed -4.1°C in January, 28.6°C in July, and 12.8°C in the year. The January difference between the periods 1874-1960 and 1874-1980 is 0.8°C , the difference between the periods 1927-2010 and 1946-1975 in January is 0.4°C , the difference between 1971-2000 and 1976-2010 is 0.4°C , and the difference between the periods 1976-2010 and 1992-2022 is very small 0.2°C . It can be seen that the average air temperatures in our modern era are rhythmically higher. The this meteorological station has also been warming up its climate for the past 30 years.

Table of perennial average air temperatures calculated for different periods at Namangan meteorological station. Table 5.

Months													
Period	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Yil
1881-1960	-3,4	0,9	8,1	15,8	21,5	25,6	27,6	25,4	20,1	12,9	5,8	0,4	13,4
1881-1980	-2,5	0,8	8,8	16,3	21,4	25,5	26,9	25,0	20,2	13,3	6,1	0,4	13,5
1927-2010	-1,6	1,9	8,6	16,0	21,4	25,6	27,3	25,4	20,5	13,8	6,6	0,9	13,9
1946-1975	-2,2	1,6	8,6	16,1	22,2	25,6	27,2	25,0	20,1	13,3	5,5	0,4	13,6
1971-2000	-1,0	1,4	8,5	16,5	21,6	26,5	27,7	25,4	20,6	13,9	7,1	1,5	14,3
1976-2010	-0,1	2,9	9,3	16,3	21,4	26,3	27,7	26,0	21,0	14,1	7,9	2,1	14,6
1992-2022	0,9	3,4	9,9	17,0	22,8	27,7	28,3	26,7	21,9	15,0	8,3	3,0	15,4

Based on the 141-year data obtained at the Namangan meteorological station in our current times, we will analyze below how climate warming is going. Initially, the average January air temperature for the period 1881-1960 was -3.4°C , in July 27.6°C , and in the year 13.4°C . In the period 1881-1980, it had -2.5°C in January, 26.9°C in summer, 13.5°C on average, -1.6°C in January 1927-2010, 27.3°C in July, and 13.9°C in years. 1946-1975 -2.2°C in January, 27.2°C in July, 13.6°C in July, 1971-2000 -1.0°C in January, 27.7°C in July, 14.3°C in July, 1976-2010 -0.1°C in January, 27.7°C in July, and 14.6°C in winter , 1992-2022 -0.9°C in January, 28.3°C in July, and the yearbook was 15.4°C . The difference between 1881-1960 and 1881-1980 is 0.1°C , the difference between 1927-2010 and 1946-1975 is 0.3°C , the difference

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between 1971-2000 and 1976-2010 is 0.3 °C, and the difference between 1976-2010 and 1992-2022 is 0.8 °C gat eng. The coldest January here was -3.4 °C in 1881-1960 and the hottest January was 0.9 °C in 1992-2022. The coldest summer in Namangan was 1881-1980 when 26.9 °C was observed. The hottest summer month as we see is 28.3 °C observed in 2022.

Table of perennial average air temperatures calculated for different periods at Navoi meteorological station. Table 6.

Months													
Period	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Yil
1928-1960	0,2	3,2	8,4	15,3	21,7	26,0	28,2	26,1	19,8	13,2	7,1	2,6	14,3
1928-1980	0,6	3,7	8,4	15,6	21,0	26,0	28,2	26,0	20,0	13,9	7,3	2,9	14,5
1927-2010	1,2	4,0	8,6	15,6	21,3	25,8	28,1	26,0	20,2	13,5	7,6	3,2	14,6
1946-1975	0,5	3,9	8,4	15,0	21,4	25,7	28,0	25,7	19,6	13,1	7,2	2,4	14,2
1971-2000	1,3	3,1	8,6	16,5	21,6	26,9	28,9	26,5	20,3	13,5	8,2	3,9	14,9
1976-2010	1,6	4,1	9,4	16,9	21,4	27,1	28,5	25,9	20,1	14,2	8,2	3,9	15,1
1992-2022	2,6	5,0	10,2	17,3	23,1	28,3	30,0	27,5	22,0	15,1	8,3	4,0	16,1

Average air temperatures in this table, recorded at Navoiy meteorological station, indicate that in the period 1928-1960, 0.2 °C was the most in January, 28.2 °C in July, and 14.3 °C gat was the most in the year. 0.6 °C in January 1928-1980, 28.2 °C in July, 14.5 °C in July, 1.2 °C in January 1927-2010, 28.1 °C in July, 14.6 °C per annum, 0.5 °C in January 1946-1975, 28.0 °C in July, 14.2 °C in January 1971-2000, 1.3 °C in July 28.9 °C, annual 14.9 °C, average air temperature in winter 1976-2010 period was 1.6 °C, in July 28.5 °C, average multi-year 15.1 °C, in January 2.6 °C in 1992-2022 period, and 30.0 °C in July, and average multi-year 16.1 °C. The difference between the periods 1928-1960 and 1928-1980 was 0.2 °C, the average perennial air temperature difference between the periods 1927-2010 and 1946-1975 was 0.4 °C, 1971-2000 and 1976-2010 was 0.2 °C, and 1976-2010 and 1992-2022. The coldest winter in this is 0.2 °C from 1928-1960. The hottest summer was 30.0 °C at the stantion in the period 1992-2022. The nave is also cooler in earlier periods, while in the present period the air temperature can be seen as the heater rises.

Table of perennial average air temperatures calculated for different periods at Andijan meteorological station. Table 7.

Months													
Period	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Yil
1900-1960	-3,0	0,6	8,3	15,6	21,2	25,4	27,3	25,7	20,6	13,6	6,0	0,9	13,5
1900-1980	-2,0	1,2	8,5	16,9	21,4	25,0	26,3	24,2	20,0	13,3	6,3	1,8	13,6
1927-2010	-1,5	1,0	8,5	16,5	21,5	25,2	27,0	25,2	20,1	13,5	6,8	1,8	13,8
1946-1975	-1,8	3,7	8,1	17,0	21,1	25,2	26,3	24,4	19,8	12,9	6,0	1,5	13,7
1971-2000	-1,0	1,5	8,2	16,0	20,8	25,7	27,4	25,1	20,0	13,2	7,0	1,7	13,8
1976-2010	0,9	3,0	9,4	16,2	21,5	26,2	27,4	24,8	20,2	13,7	7,2	2,2	14,4
1992-2022	0,2	3,2	9,8	16,0	21,1	25,5	27,0	25,2	20,3	13,3	6,7	1,2	14,1

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The average January air temperature at Andijan meteorological station is -3.0°C in the period 1900-1960, and 27.3°C in the summer, with an average perennial temperature of 13.5°C . -2.0°C in the 1900-1980 period, 26.3°C in July, 13.6°C in the 1927-2010 period, -1.5°C in January, 27.0°C in July, 13.8°C in January, 1946-1975 -1.8°C , 26.3°C in July, 13.7°C in January, 1971-2000 period -1.0°C , July 27.4°C , year 13.8°C , January 1976-2010 0.9°C , July 27.4°C , year 14.4°C , January 1992-2022 0.2°C , July 27.0°C and average multi-year 14.1°C . The difference between 1900-1960 and 1900-1980 is 0.1°C , the difference between 1927-2010 and 1946-1975 is 0.1°C , the difference between 1971-2000 and 1976-2010 is 0.6°C , and the difference between 1976-2010 and 1992-2022 is 0.3°C . Even at this meteorological station, it is evident that mainly the average air temperature is warming rhythmically in the last 30 years.

Table of average amounts of oil per year, calculated for different periods. Table 8.

Period	T.Observatoriya	Termiz	Samarqand	Nukus	Namangan	Navoiy	Andijon
1881-1935	359	133	328	82	188	177	226
1881-1964	384	128	313	83	182	178	247
1891-1980	405	140	358	102	189	202	261
1926-1945	370	113	320	107	185	155	238
1946-1975	397	108	307	95	168	147	243
1971-2000	426	148	360	104	185	194	241
1976-2010	399	135	376	106	194	156	236
1992-2022	455	162	382	111	214	196	258

This table lists the average amount of perennials for different periods. According to him, initially, at the Tashkent Observatory in 1881-1935, the fat content was 359 mm. 384 mm in 1881-1964, 405 mm in 1891-1980, 370 mm in 1926-1945, 397 mm in 1946-1975, 426 mm in 1971-2000, 399 mm in 1976-2010, and 455 mm in 1992-202, increasing the amount of annual oil in the present period compared to previous periods.

In Termez, however, this figure is considered much lower. In the period 1881-1935, the average perennial fat content was 133 mm, 1881-1964 128 mm, 140 mm in 1891-1980, 113 mm in 1926-1945, 108 mm in 1946-1975, 148 mm in 1971-2000, 135 mm in 1976-2010, 1992-22 162 mm did. Even in the Termez, the amount of fat has increased significantly in the new years than in the old ones.

In Samarkand, the average perennial oil content in 1881-1935 was 328 mm, 313 mm in 1881-1964, 358 mm in 1891-1980, 320 mm in 1926-1945, 307 mm in 1946-1975, 360 mm in 1971-2000, 376 mm in 1976-2010, and in 1992-2022 the highest indicator of 382 mm is retracted.

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Nukus originally had 82 mm in 1881-1935, 83 mm in 1881-1964, 102 mm in 1891-1980, 107 mm in 1926-1945, 95 mm in 1946-1975, 104 mm in 1971-2000, 106 mm in 1976-2010, and 111 mm in 1992-2022. This meteorological station also shows an increase in the average amount of precipitation per year over the last 30 years.

Perennial precipitation at Namangan meteorological station is 188 mm in 1881-1935, 182 mm in 1881-1964, 189 mm in 1891-1980, 185 mm in 1926-1945, 168 mm in 1946-1975, 185 mm in 1971-2000, 194 mm in 1976-2010, 194 mm in 1992-2022 and in the period it was 214 mm. The amount of fat in Current years has been much higher than in previous years.

The Navoiy has a perennial oil content of 177 mm for 1881-1935, 178 mm in 1881-1964, 202 mm in 1891-1980, 155 mm in 1926-1945, 147 mm in 1946-1975, 194 mm in 1971-2000, 156 mm in 1976-2010, and 1992-2022 196 mm. The amount of fat given for the last 1992-2022 period is the highest.

Andijan has 226 mm in 1881-1935, 247 mm in 1881-1964, 261 mm in 1891-1980, 238 mm in 1926-1945, 243 mm in 1946-1975, 241 mm in 1971-2000, 236 mm in 1976-2010, and 258 mm in 1992-2022 did.

The amount of perennial fat given for different periods derived from the 7 meteorological stations in the Republic listed in the table above has been rhythmically significantly increased up to the current years. The origin of the main oil dates back to the last 30 years. We can see from these graphs and tables that the temperature of the air is increasing warming and, accordingly, the amount of fat is also increasing. The average air temperature has also been significantly rhythmic in the last 30 years. One of the most abundant meteorological stations is the Tashkent Observatory. It has a higher fat content than the rest. The most precipitation according to data was 455 mm in the period 1992-2022. The minimum annual precipitation was observed at the Nukus meteorological station, which in 1881-1935 had a value of 82 mm. This pointer is the least. In Nukus, too, the high value of fat is observed in the period 1992-2022gn in which 111 mm of fat per fat. From the table above, it can be seen that in the previous Old periods, the amount of fat was low, which was much lower than in the new present period. This can be seen at all stations. So we can clearly see that the annual fat content also changes accordingly as the average air temperature rises. So it can be seen that our climatic conditions today are changing in this way.

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