In [1]:
```python
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import io
import requests
import datetime
```

In [3]:
```python
df = pd.read_csv('https://raw.githubusercontent.com/mwitiderrick/stockprice/master/NSE-TATAGLOBAL.csv')
df.head()
```

Out[3]:

	Date	Open	High	Low	Last	Close	Total Trade Quantity	Turnover (Lacs)
0	2018-09-28	234.05	235.95	230.20	233.50	233.75	3069914	7162.35
1	2018-09-27	234.55	236.80	231.10	233.80	233.25	5082859	11859.95
2	2018-09-26	240.00	240.00	232.50	235.00	234.25	2240909	5248.60
3	2018-09-25	233.30	236.75	232.00	236.25	236.10	2349368	5503.90
4	2018-09-24	233.55	239.20	230.75	234.00	233.30	3423509	7999.55

In [4]:
```python
df.shape
```

Out[4]:
```
(2035, 8)
```

In [5]:
```python
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2035 entries, 0 to 2034
Data columns (total 8 columns):
 #   Column                Non-Null Count  Dtype  
---  ------                --------------  -----  
 0   Date                  2035 non-null   object 
 1   Open                  2035 non-null   float64
 2   High                  2035 non-null   float64
 3   Low                   2035 non-null   float64
 4   Last                  2035 non-null   float64
 5   Close                 2035 non-null   float64
 6   Total Trade Quantity  2035 non-null   int64  
 7   Turnover (Lacs)       2035 non-null   float64
dtypes: float64(6), int64(1), object(1)
memory usage: 127.3+ KB
```

In [6]:
```python
df.describe()
```

Out[6]:

	Open	High	Low	Last	Close	Total Trade Quantity	Turnover (Lacs)
count	2035.000000	2035.000000	2035.000000	2035.000000	2035.00000	2.035000e+03	2035.000000
mean	149.713735	151.992826	147.293931	149.474251	149.45027	2.335681e+06	3899.980565
std	48.664509	49.413109	47.931958	48.732570	48.71204	2.091778e+06	4570.767877
min	81.100000	82.800000	80.000000	81.000000	80.95000	3.961000e+04	37.040000
25%	120.025000	122.100000	118.300000	120.075000	120.05000	1.146444e+06	1427.460000
50%	141.500000	143.400000	139.600000	141.100000	141.25000	1.783456e+06	2512.030000
75%	157.175000	159.400000	155.150000	156.925000	156.90000	2.813594e+06	4539.015000
max	327.700000	328.750000	321.650000	325.950000	325.75000	2.919102e+07	55755.080000

In [7]:
```python
df.dtypes
```

Out[7]:
```
Date                     object
Open                    float64
High                    float64
Low                     float64
Last                    float64
Close                   float64
Total Trade Quantity      int64
Turnover (Lacs)         float64
dtype: object
```

In [8]:
```python
missing_values_count = df.isnull().sum()

total_cells = np.product(df.shape)

total_missing = missing_values_count.sum()

percentage_missing = (total_missing/total_cells)*100

print(percentage_missing)
```

```
0.0
```

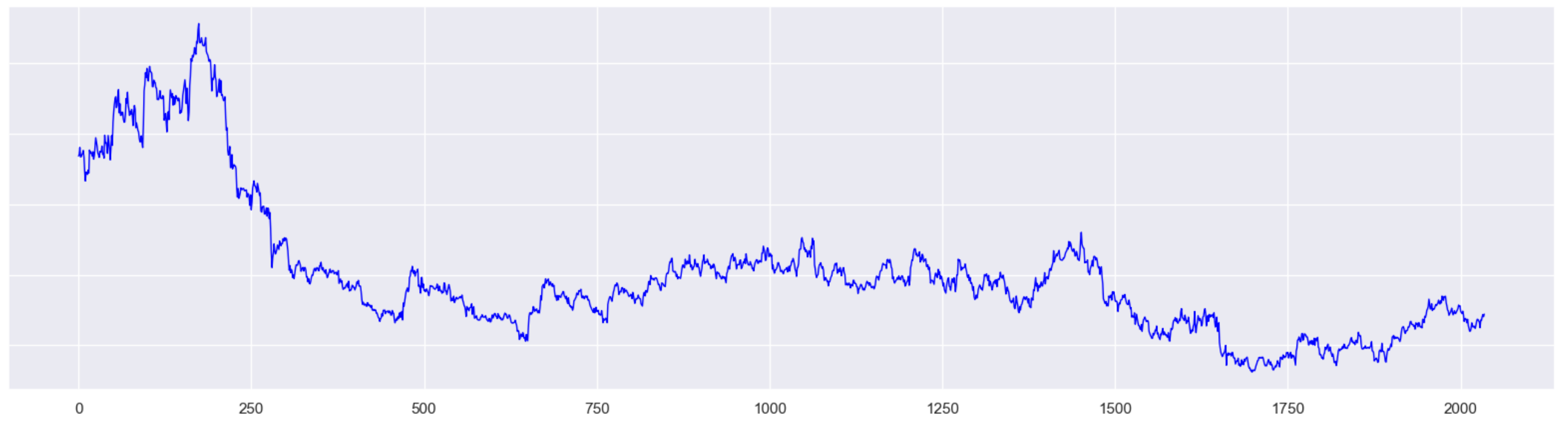
In [9]:
```python
NAN = [(c, df[c].isnull().mean()*100) for c in df]
NAN = pd.DataFrame(NAN, columns=['column_name', 'percentage'])
NAN
```

Out[9]:

	column_name	percentage
0	Date	0.0
1	Open	0.0
2	High	0.0
3	Low	0.0
4	Last	0.0
5	Close	0.0
6	Total Trade Quantity	0.0
7	Turnover (Lacs)	0.0

In [10]:
```python
sns.set(rc = {'figure.figsize': (20, 5)})
df['Open'].plot(linewidth = 1,color='blue')
```

Out[10]: <Axes: >

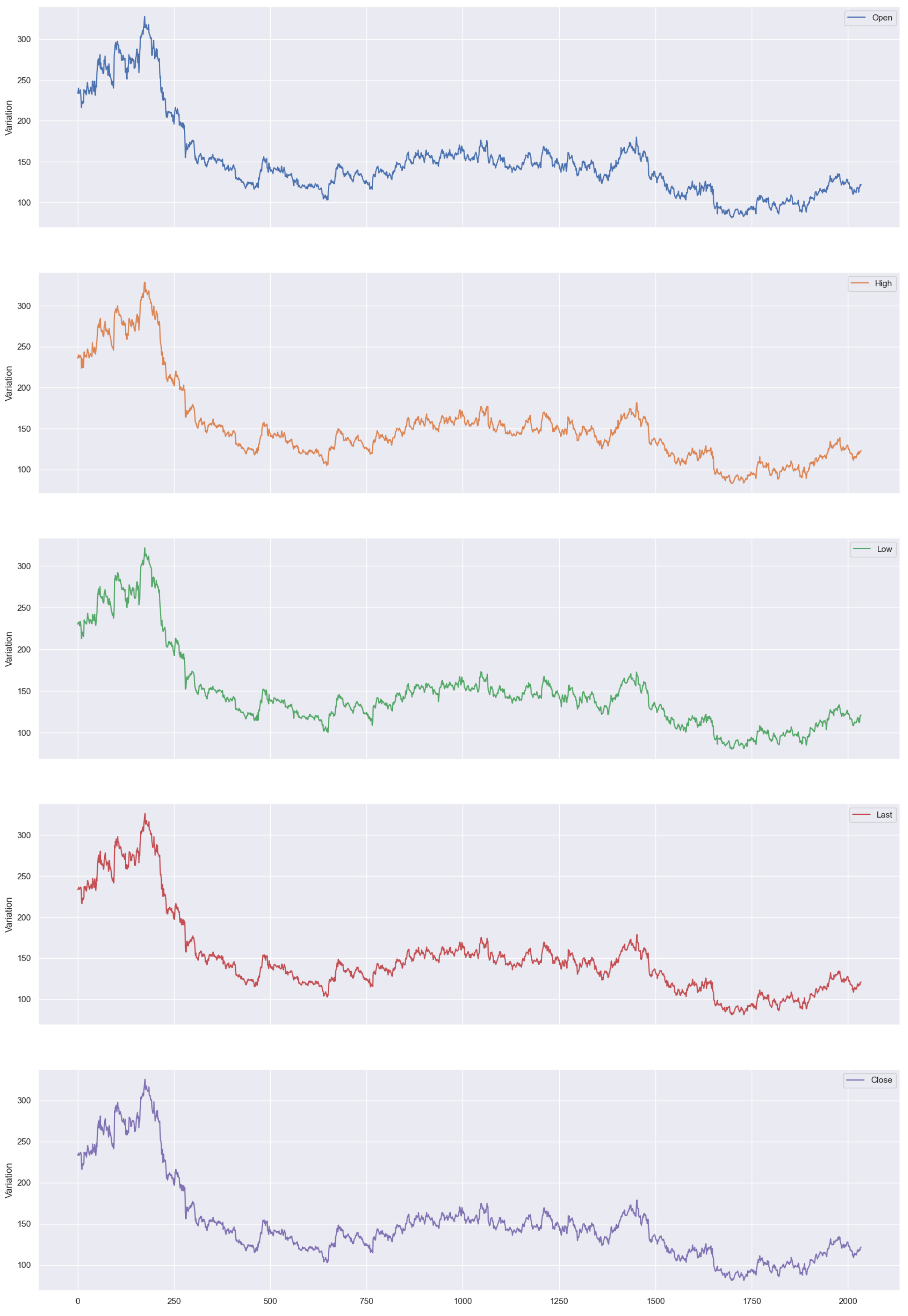


In [11]:
```python
df.columns
```

Out[11]:
```
Index(['Date', 'Open', 'High', 'Low', 'Last', 'Close', 'Total Trade Quantity',
       'Turnover (Lacs)'],
      dtype='object')
```

In [12]:
```python
cols_plot = ['Open','High','Low','Last','Close']
axes = df[cols_plot].plot(alpha = 1, figsize=(20, 30), subplots = True)

for ax in axes:
    ax.set_ylabel('Variation')
```



In [15]:
```python
del df["Date"]
```

In [16]:
```python
df.dtypes
```

Out[16]:
```
Open                    float64
High                    float64
Low                     float64
Last                    float64
Close                   float64
Total Trade Quantity      int64
Turnover (Lacs)         float64
dtype: object
```

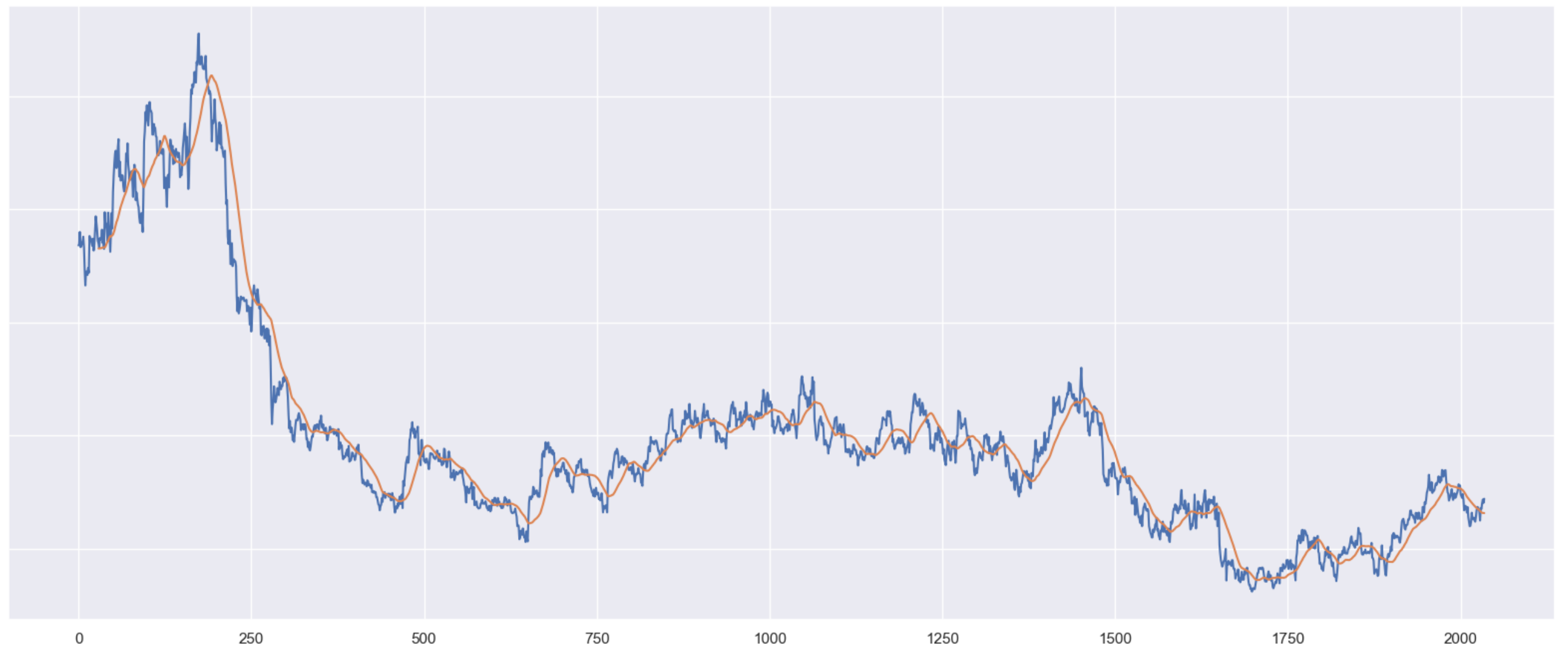
In [17]:
```python
df.rolling(7).mean().head(10)
```

Out[17]:

	Open	High	Low	Last	Close	Total Trade Quantity	Turnover (Lacs)
0	NaN	NaN	NaN	NaN	NaN	NaN	NaN
1	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2	NaN	NaN	NaN	NaN	NaN	NaN	NaN
3	NaN	NaN	NaN	NaN	NaN	NaN	NaN
4	NaN	NaN	NaN	NaN	NaN	NaN	NaN
5	NaN	NaN	NaN	NaN	NaN	NaN	NaN
6	235.200000	237.557143	231.135714	234.414286	234.307143	3.274848e+06	7652.388571
7	235.750000	238.028571	231.607143	234.700000	234.492857	3.209831e+06	7509.724286
8	235.550000	238.200000	231.485714	235.071429	234.971429	2.936693e+06	6879.075714
9	233.185714	237.728571	230.171429	234.928571	234.928571	3.527693e+06	8241.347143

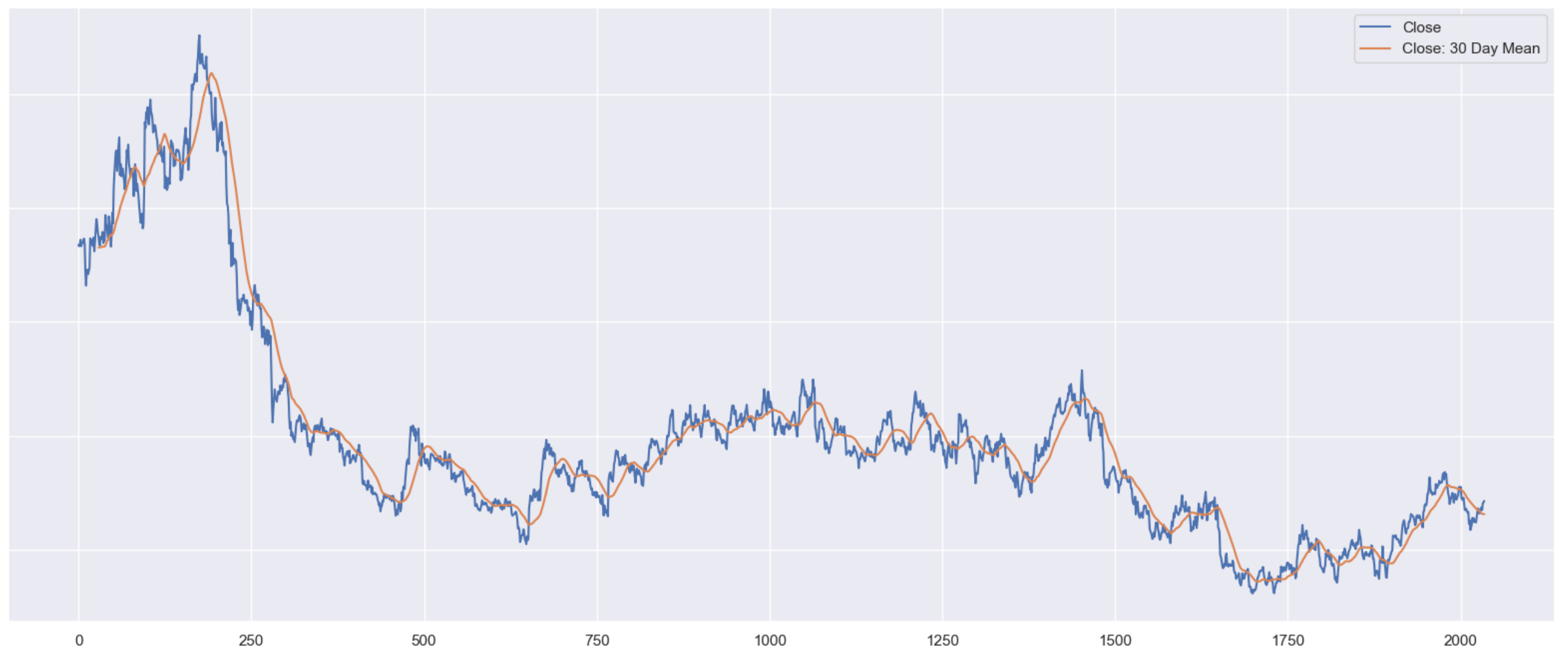
In [18]:
```python
df['Open'].plot(figsize=(20,8),alpha = 1)
df.rolling(window=30).mean()['Close'].plot(alpha = 1)
```

Out[18]: <Axes: >



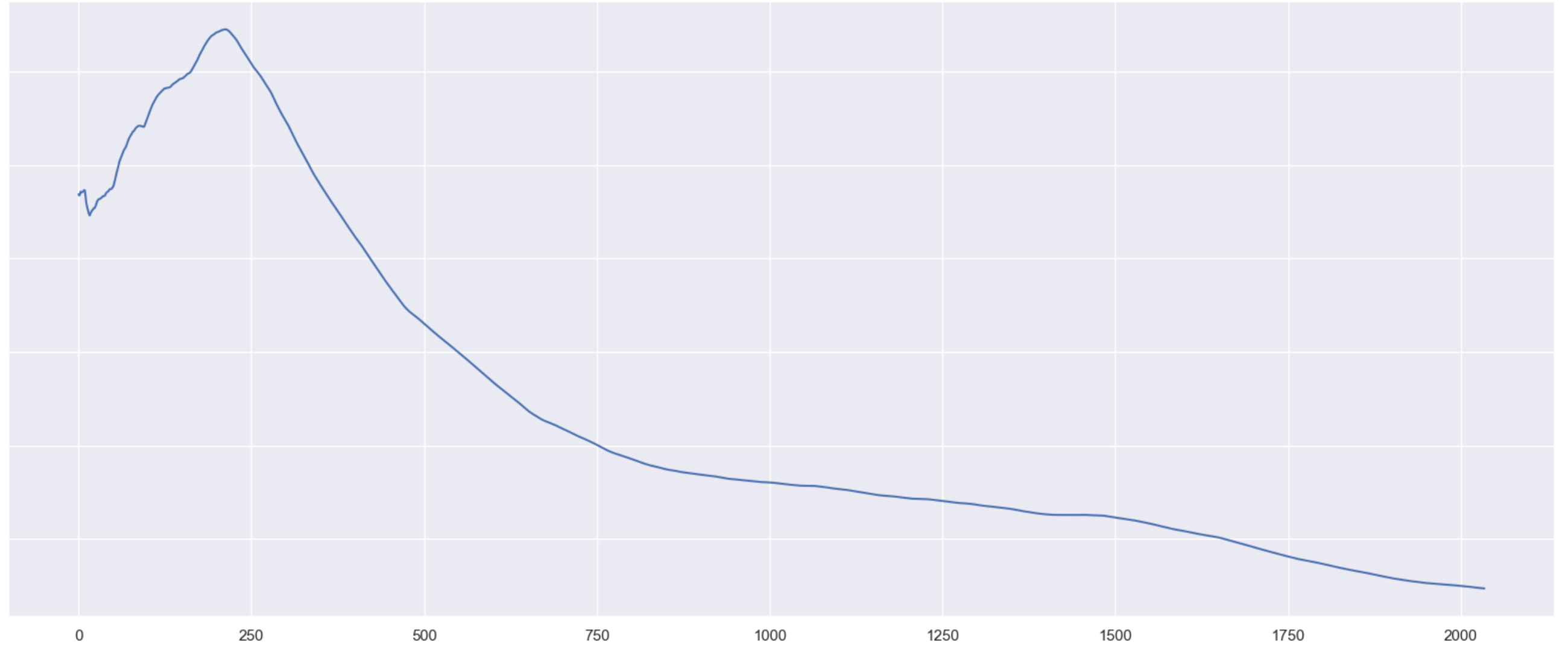
In [19]:
```python
df['Close: 30 Day Mean'] = df['Close'].rolling(window=30).mean()
df[['Close','Close: 30 Day Mean']].plot(figsize=(20,8),alpha = 1)
```

Out[19]: <Axes: >



In [20]:
```python
df['Close'].expanding(min_periods=1).mean().plot(figsize=(20,8),alpha = 1)
```

Out[20]: <Axes: >

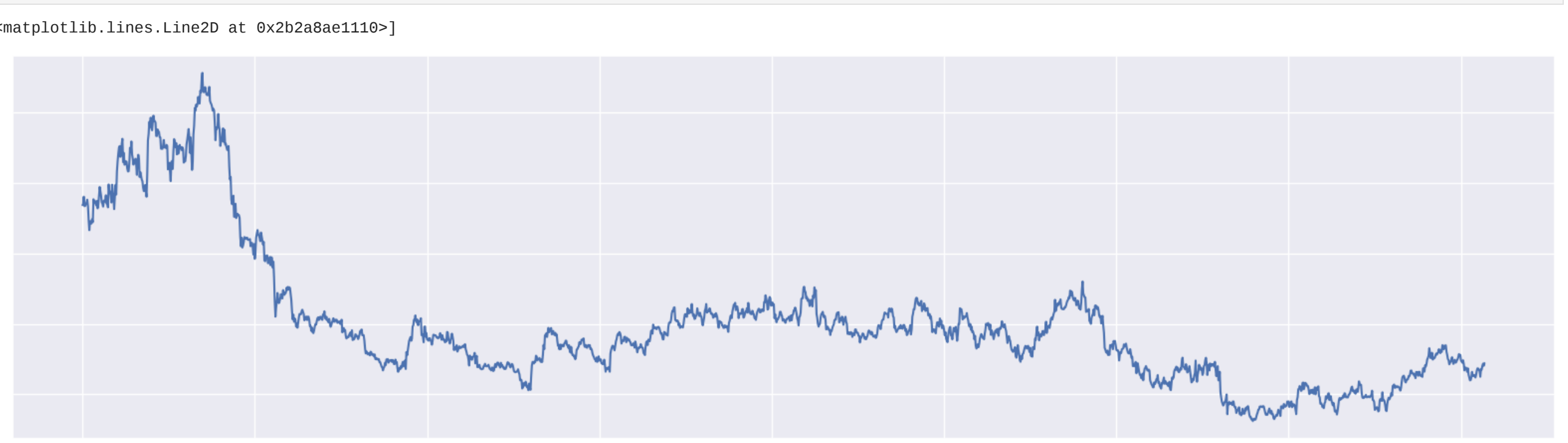


In [21]:
```python
df1=df.reset_index()['Open']
df1
```

Out[21]:
```
0       234.05
1       234.55
2       240.00
3       233.30
4       233.55
         ...  
2030    117.60
2031    120.10
2032    121.80
2033    120.30
2034    122.10
Name: Open, Length: 2035, dtype: float64
```

In [22]:
```python
plt.plot(df1)
```

Out[22]:
```
[<matplotlib.lines.Line2D at 0x2b2a8ae1110>]
```



In [28]:
```python
def create_dataset(dataset, time_step=1):
    train_X, train_Y = [], []
    for i in range(len(dataset)-time_step-1):
        a = dataset[i:(i+time_step), 0]   ###i=0, 0,1,2,3-----99   100
        train_X.append(a)
        train_Y.append(dataset[i + time_step, 0])
    return numpy.array(train_X), numpy.array(train_Y)
```

In [30]:
```python
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense
from tensorflow.keras.layers import LSTM
```

In [31]:
```python
model=Sequential()
model.add(LSTM(50,return_sequences=True,input_shape=(100,1)))
model.add(LSTM(50,return_sequences=True))
model.add(LSTM(50))
model.add(Dense(1))
model.compile(loss='mean_squared_error',optimizer='adam')
```

In [32]:
```python
model.summary()
```

```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #   
=================================================================
 lstm (LSTM)                 (None, 100, 50)           10400     

 lstm_1 (LSTM)               (None, 100, 50)           20200     

 lstm_2 (LSTM)               (None, 50)                20200     

 dense (Dense)               (None, 1)                 51        

=================================================================
Total params: 50,851
Trainable params: 50,851
Non-trainable params: 0
_________________________________________________________________
```

In [ ]: