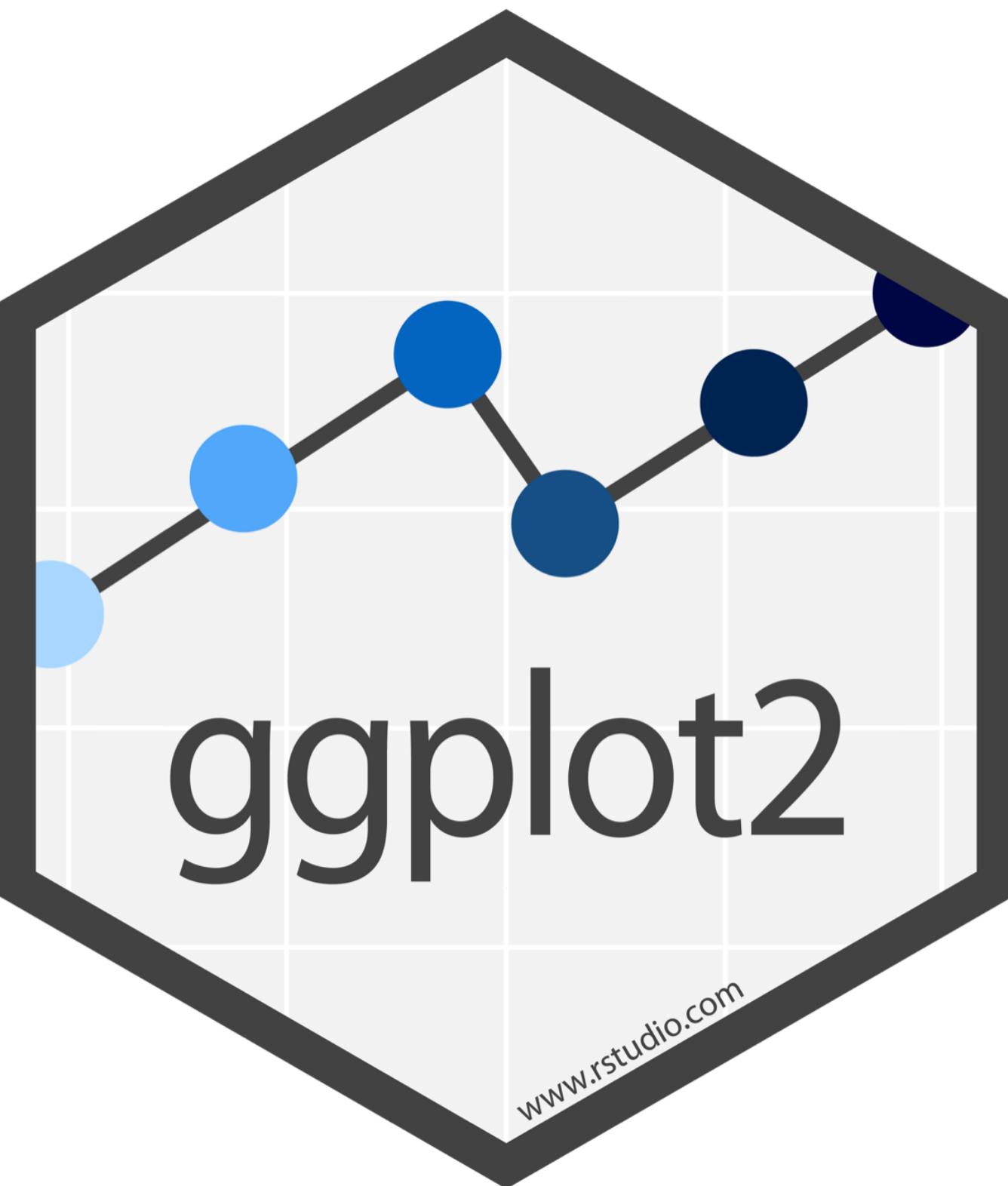


Customizing Plots with

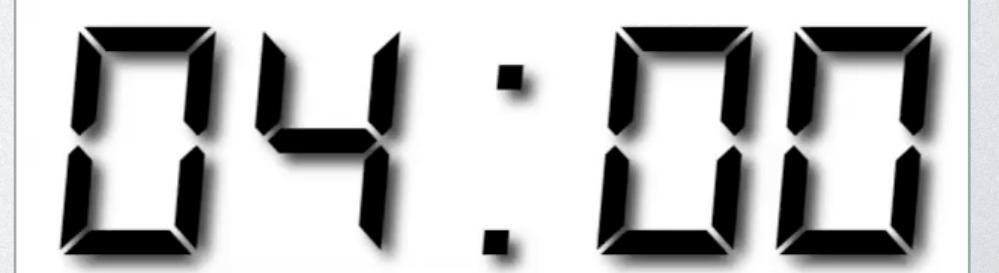


Before we begin...

Fill in the blanks to create a scatterplot using the warwick object, mapping the Fe_ppm column to the x-axis and the Mn_ppm column to the y-axis.

```
ggplot_____ +  
  geom_point(aes__ = _____, __ = _____))
```

Choices: warwick, Fe_ppm, Mn_ppm, x, y

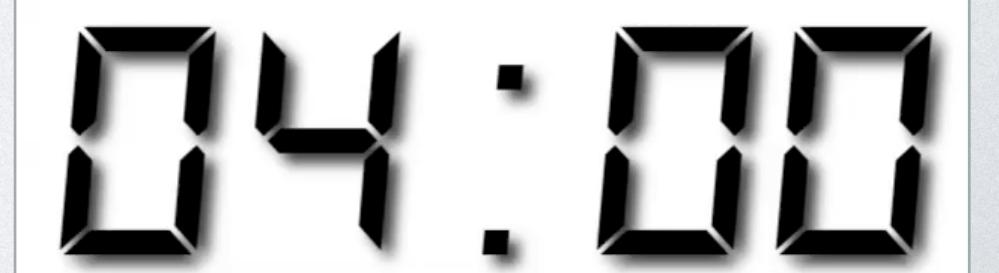


Before we begin...

Fill in the blanks to create a scatterplot using the warwick object, mapping the Fe_ppm column to the x-axis and the Mn_ppm column to the y-axis.

```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm))
```

Options: warwick, Fe_ppm, Mn_ppm, x, y, object, data



Before we begin...

To change the appearance of the non-data elements of the plot,
which of the following would you append to the plot?

```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm)) +
```

Choices: `scale_color_brewer()` OR `theme_bw()`



Before we begin...

To change the appearance of the non-data elements of the plot, which of the following would you append to the plot?

```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm)) +  
  theme_bw()
```

Choices: `scale_color_brewer()` OR `theme_bw()`



To make a graph

mpg	cyl	disp	hp	
21.0	6	160.0	2	●
21.0	6	160.0	2	●
22.8	4	108.0	1	●
21.4	6	258.0	2	●
18.7	8	360.0	3	●
18.1	6	225.0	2	●
14.3	8	360.0	5	●
24.4	4	146.7	1	●
22.8	4	140.8	1	●
19.2	6	167.6	2	●
17.8	6	167.6	2	●
16.4	8	275.8	3	●
17.3	8	275.8	3	●
15.2	8	275.8	3	●
10.4	8	472.0	4	●
10.4	8	460.0	4	●
14.7	8	440.0	4	●
32.4	4	78.7	1	●
30.4	4	75.7	1	●
33.9	4	71.1	1	●

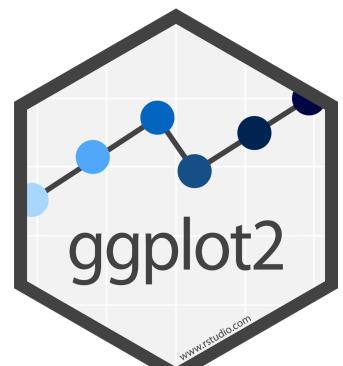
data

geom

1. Pick a **data** set

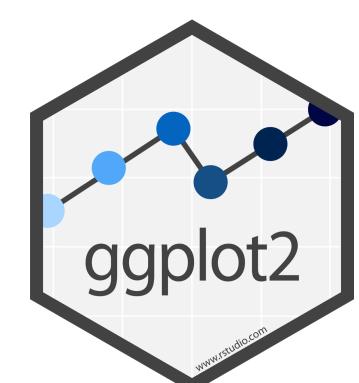
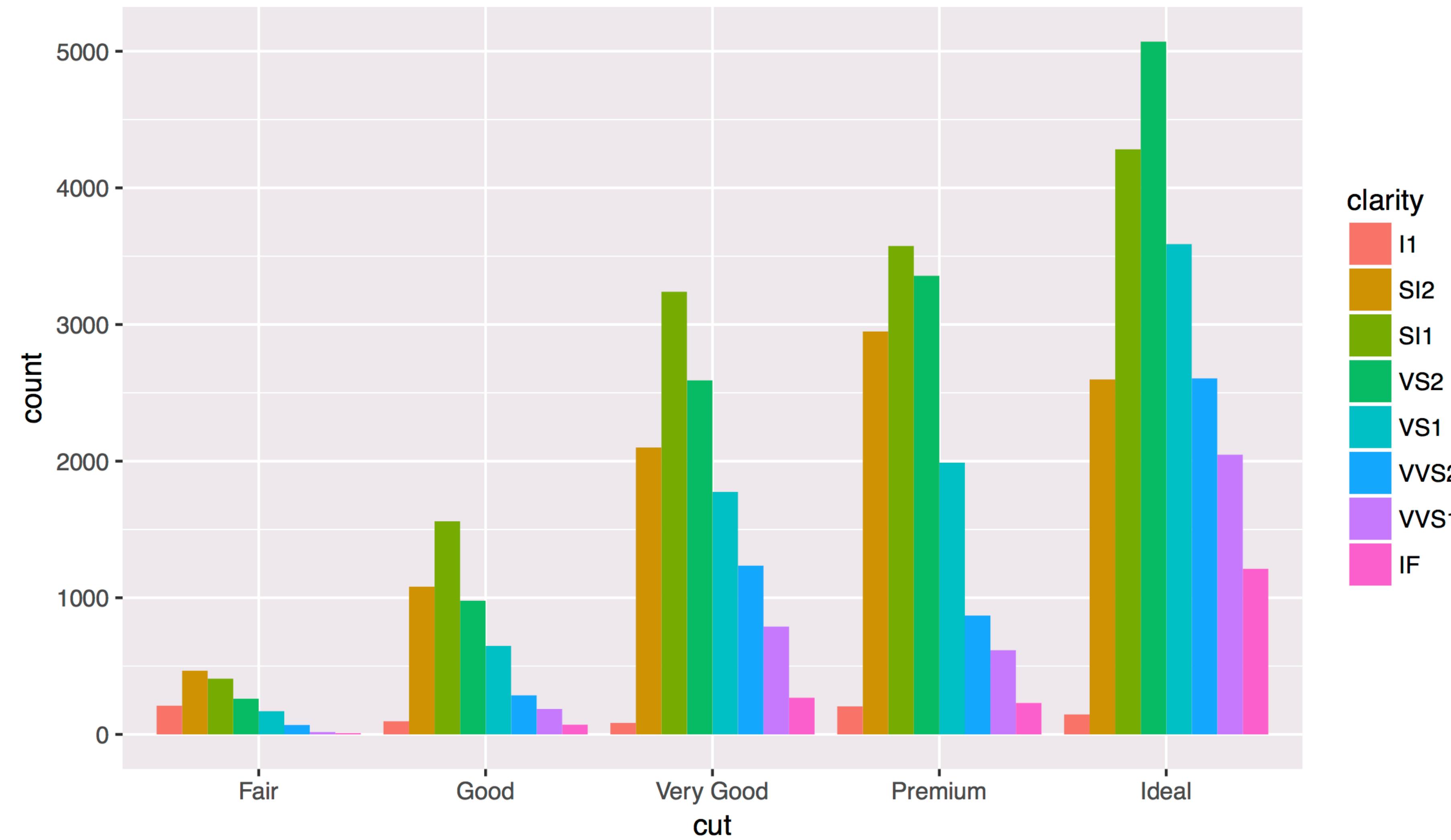
```
ggplot(data = <DATA>) +  
<GEOM_FUNCTION>(mapping = aes(<MAPPINGS>))
```

2. Choose a **geom**
to display cases



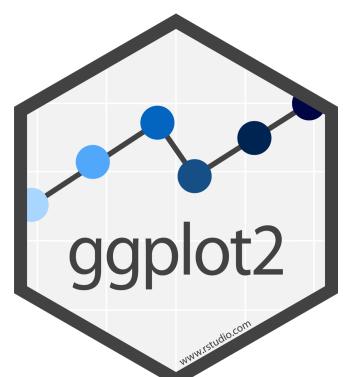
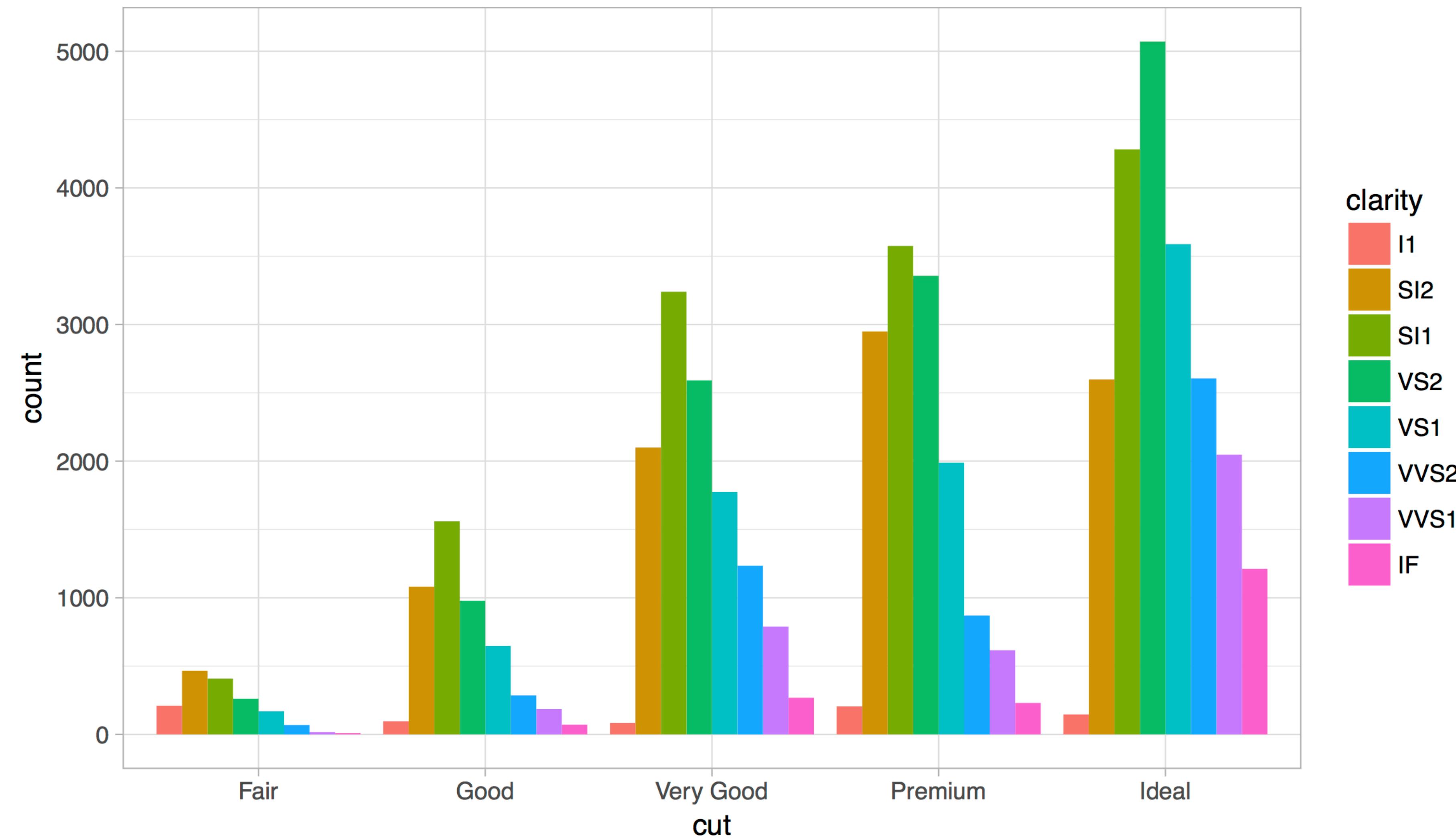
Themes

Visual appearance of non-data elements



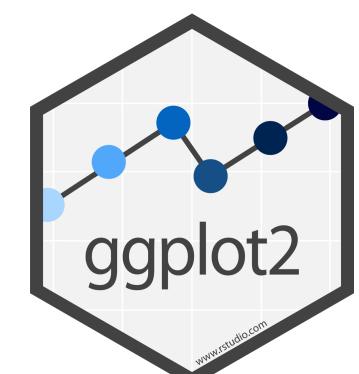
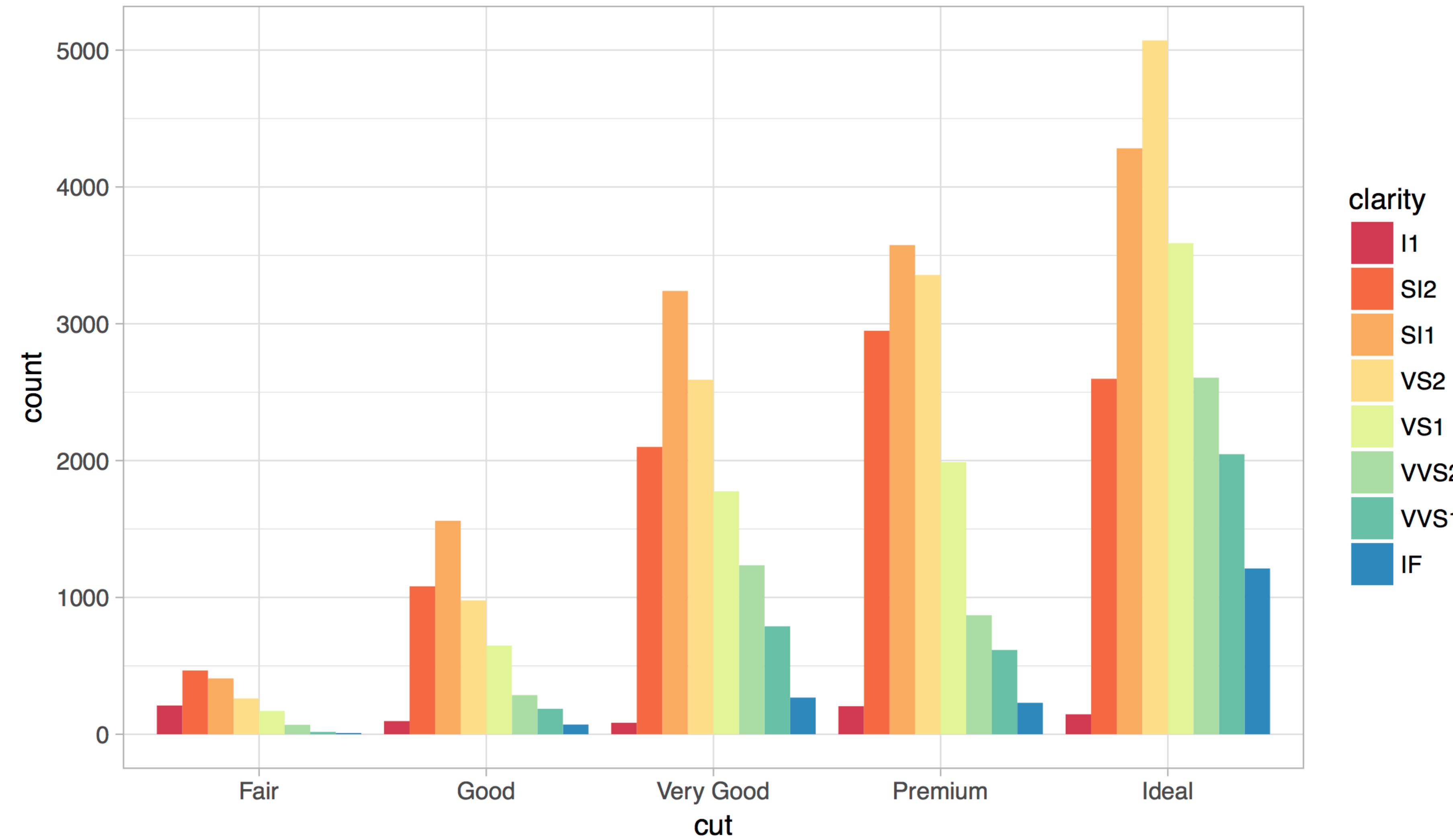
Themes

Visual appearance of non-data elements



Color Scales

Customize color scales, other mappings



To make a graph

mpg	cyl	disp	hp	
21.0	6	160.0	2	●
21.0	6	160.0	2	●
22.8	4	108.0	1	●
21.4	6	258.0	2	●
18.7	8	360.0	3	●
18.1	6	225.0	2	●
14.3	8	360.0	5	●
24.4	4	146.7	1	●
22.8	4	140.8	1	●
19.2	6	167.6	2	●
17.8	6	167.6	2	●
16.4	8	275.8	3	●
17.3	8	275.8	3	●
15.2	8	275.8	3	●
10.4	8	472.0	4	●
10.4	8	460.0	4	●
14.7	8	440.0	4	●
32.4	4	78.7	1	●
30.4	4	75.7	1	●
33.9	4	71.1	1	●

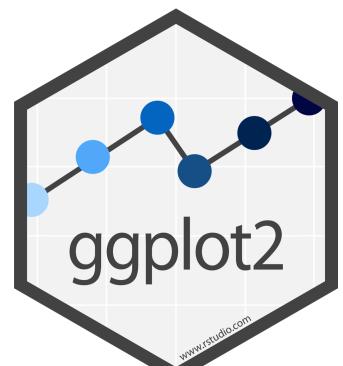
data

geom

1. Pick a **data** set

```
ggplot(data = <DATA>) +  
<GEOM_FUNCTION>(mapping = aes(<MAPPINGS>))
```

2. Choose a **geom**
to display cases

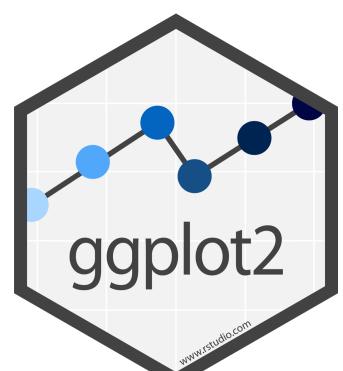
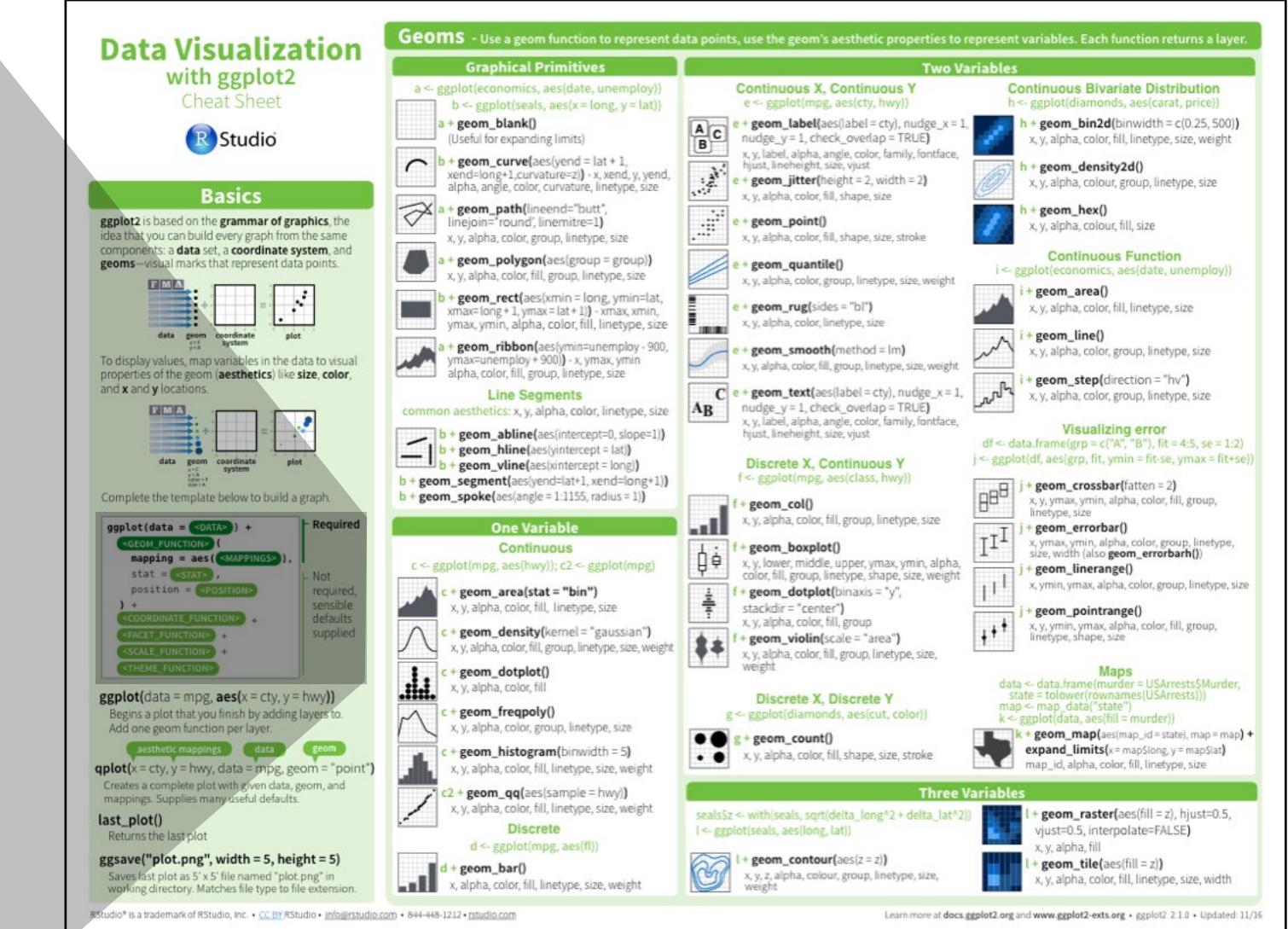


A ggplot2 template

Make any plot by filling in the parameters of this template

```
ggplot(data = <DATA>) +  
  <GEOM_FUNCTION>(  
    mapping = aes(<MAPPINGS>),  
    stat = <STAT>,  
    position = <POSITION>  
  ) +  
  <COORDINATE_FUNCTION> +  
  <FACET_FUNCTION> +  
  <SCALE_FUNCTION> +  
  <THEME_FUNCTION>
```

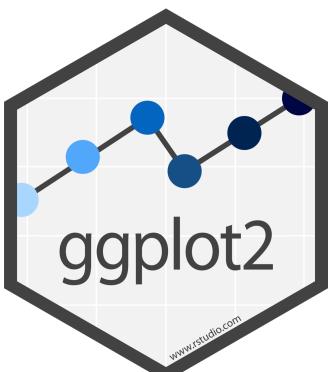
Required
Not required,
sensible
defaults
supplied



warwick

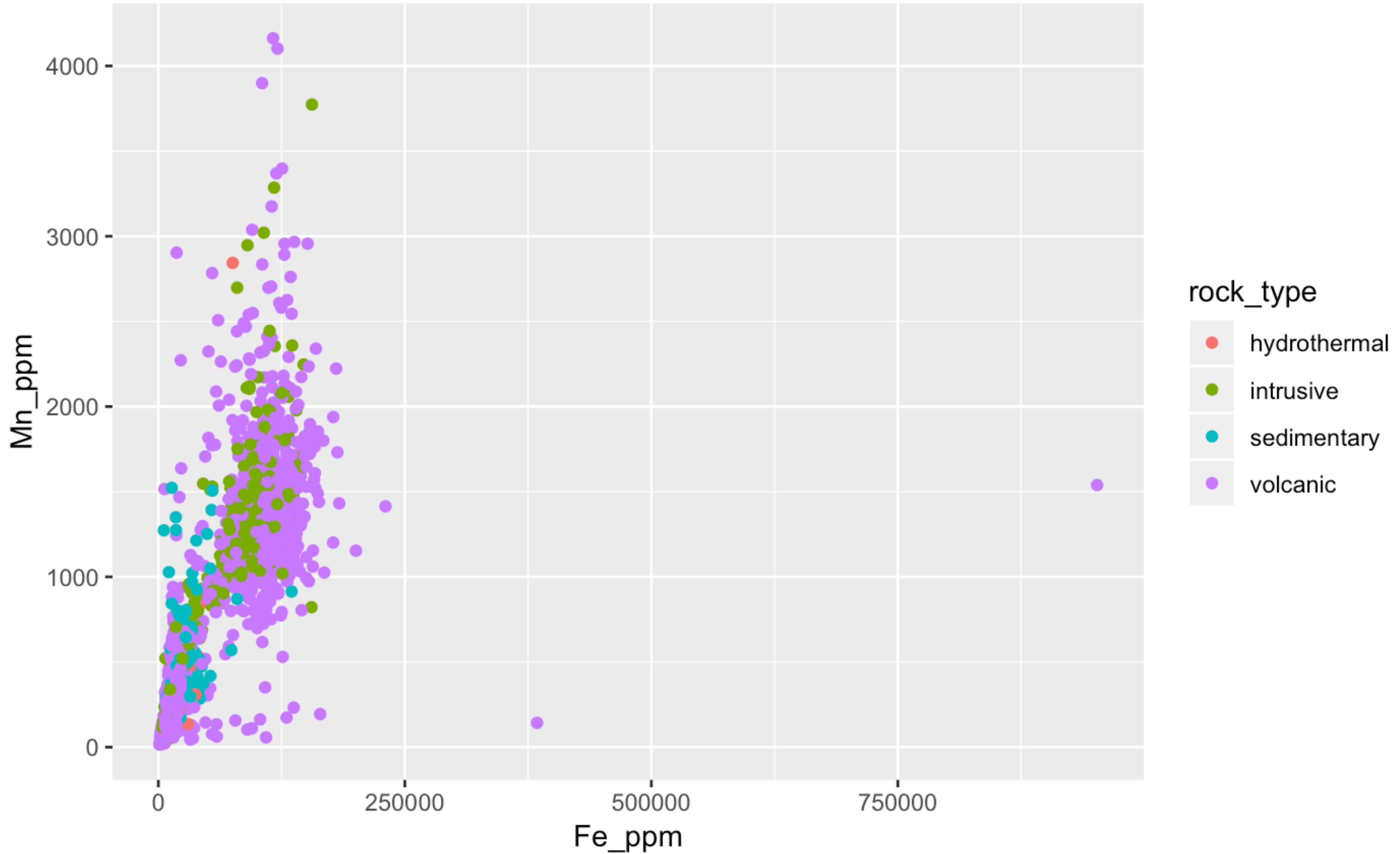
Rock sample data from the Wentworth
area, Nova Scotia

warwick

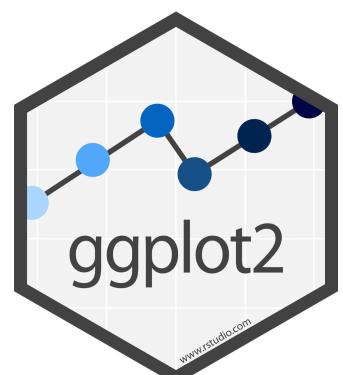


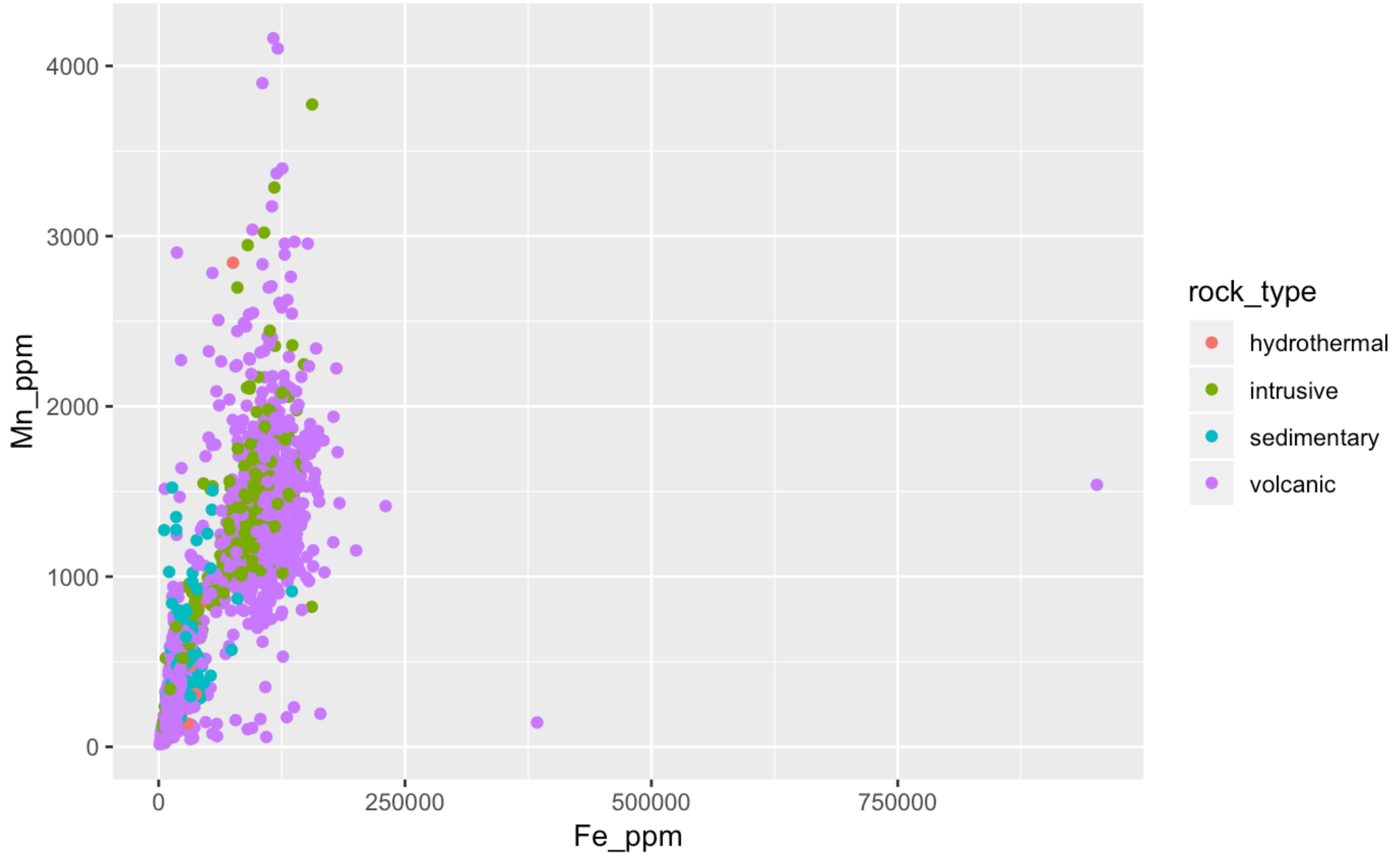
Themes

R

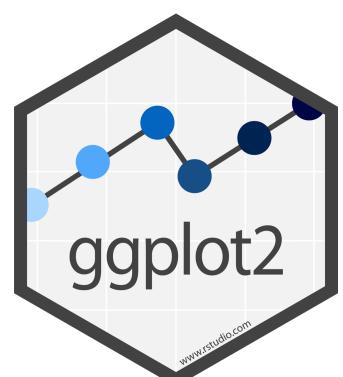


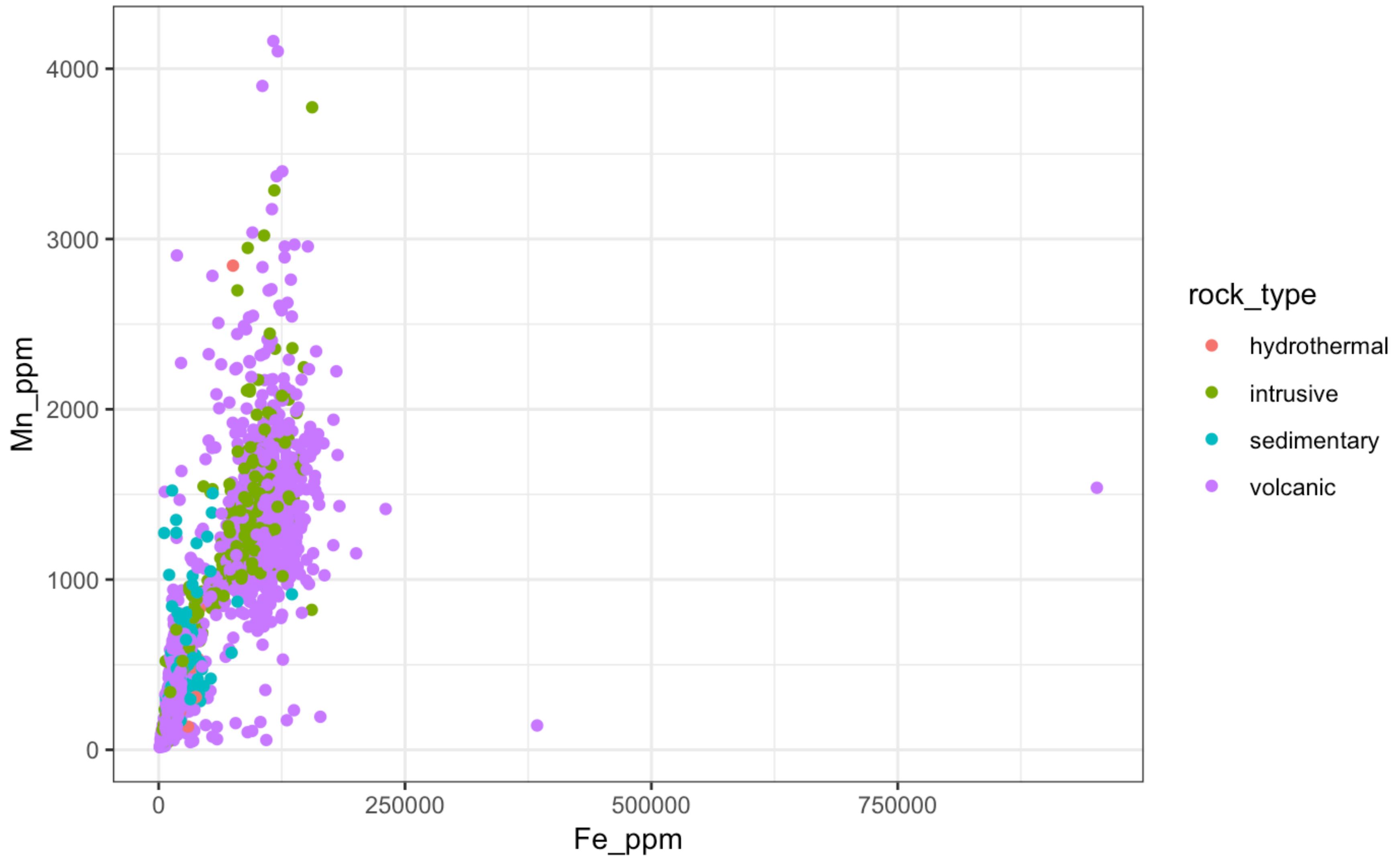
```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type))
```



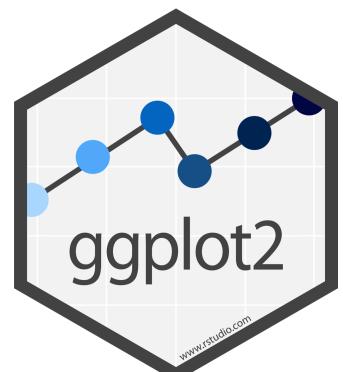


```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type)) +  
  theme_grey()
```





```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type)) +  
  theme_bw()
```

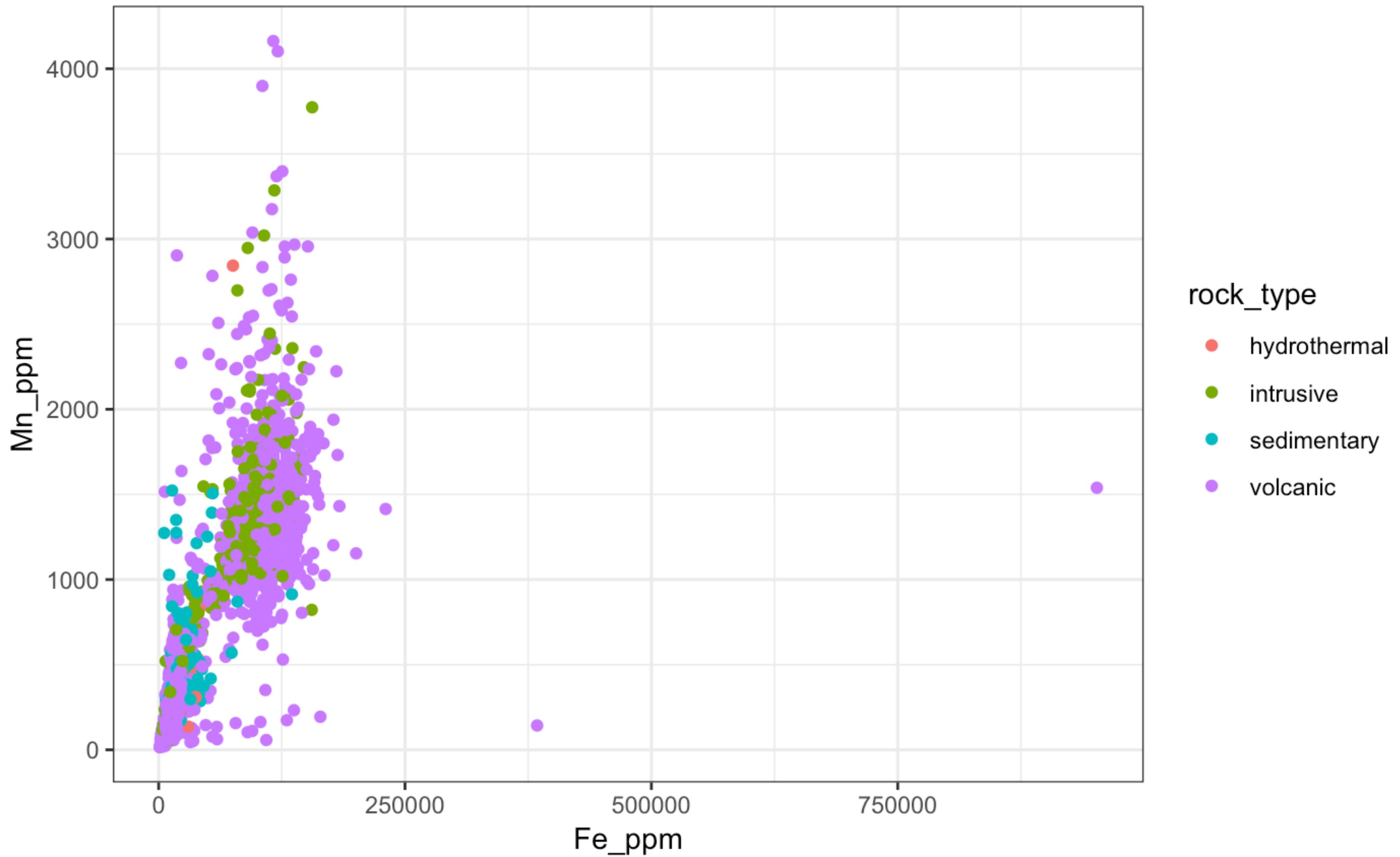


Exercise 1

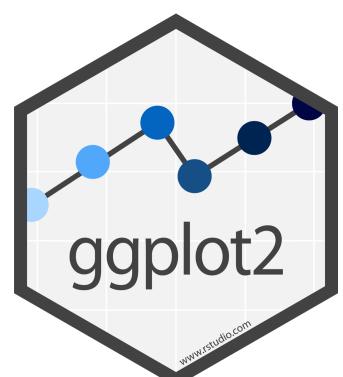
Modify the following code to use one of ggplot2's built-in themes.
Experiment! See `?theme_bw` for a list of themes that can be used.

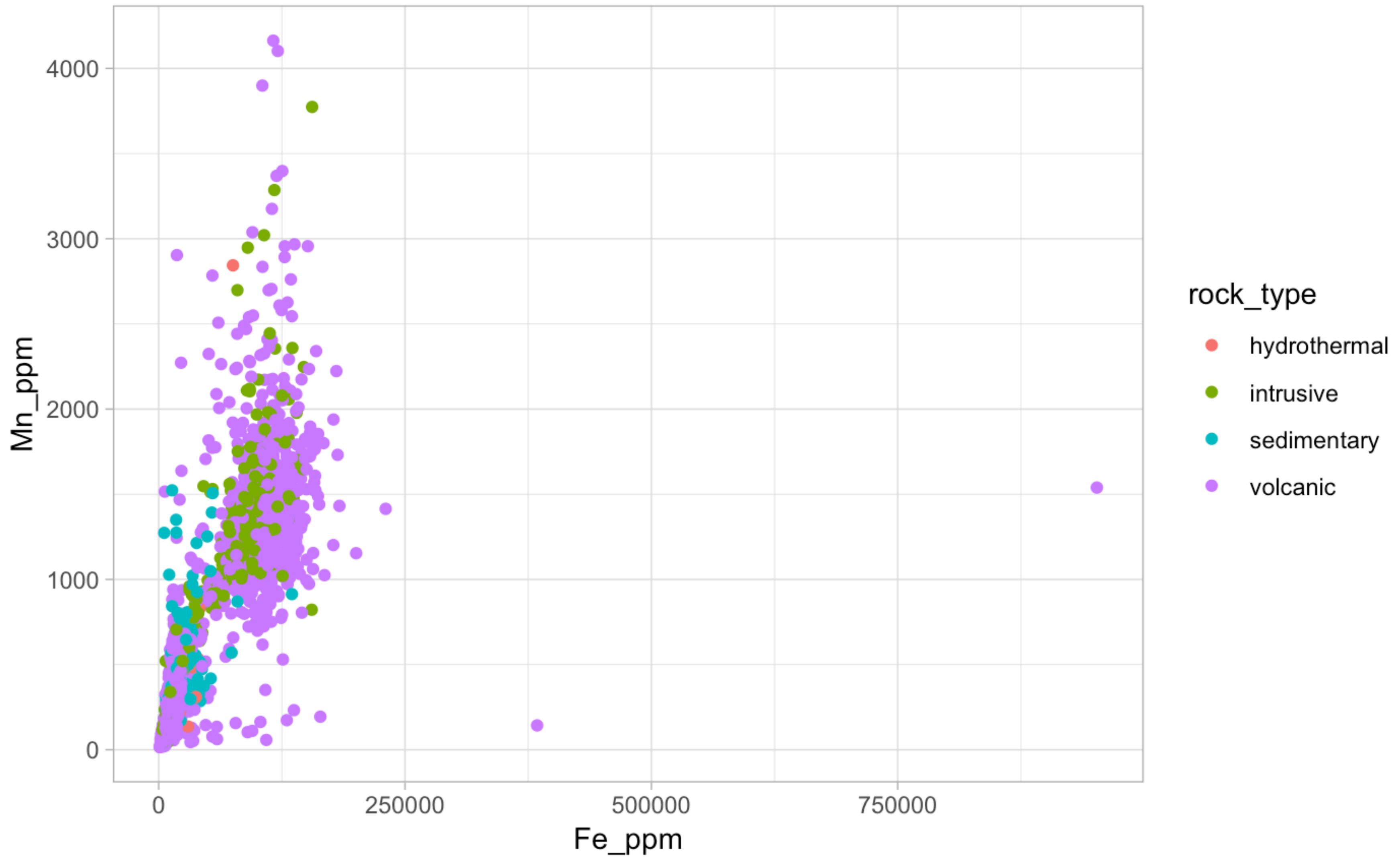
```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type))
```



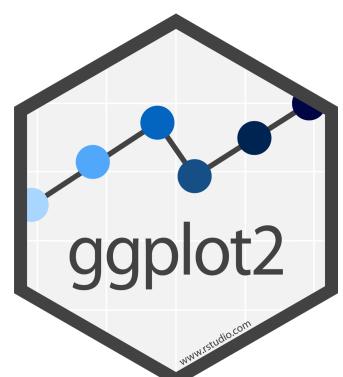


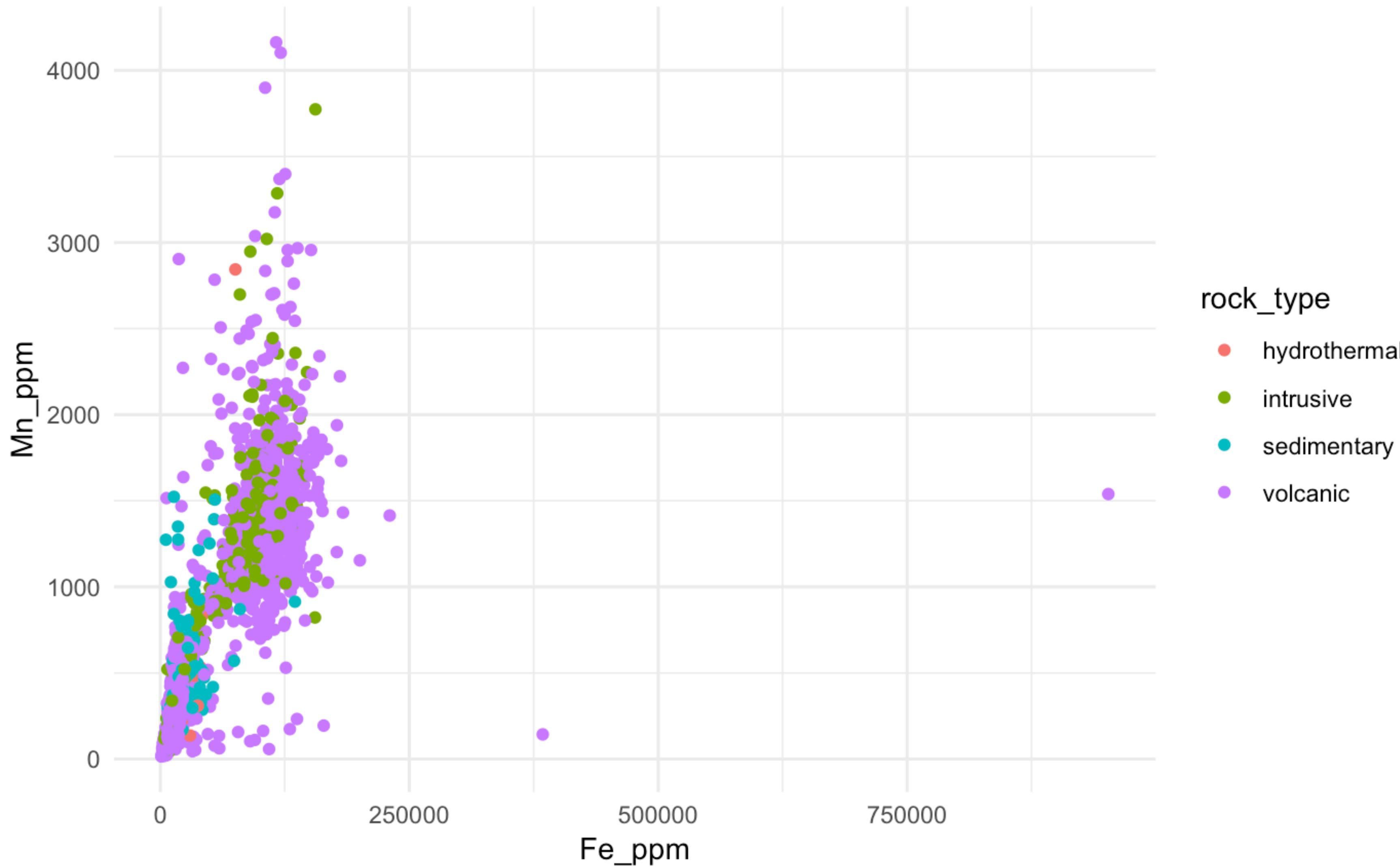
```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type)) +  
  theme_bw()
```



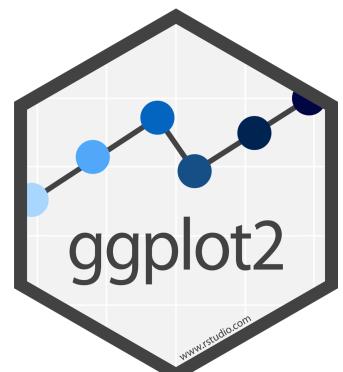


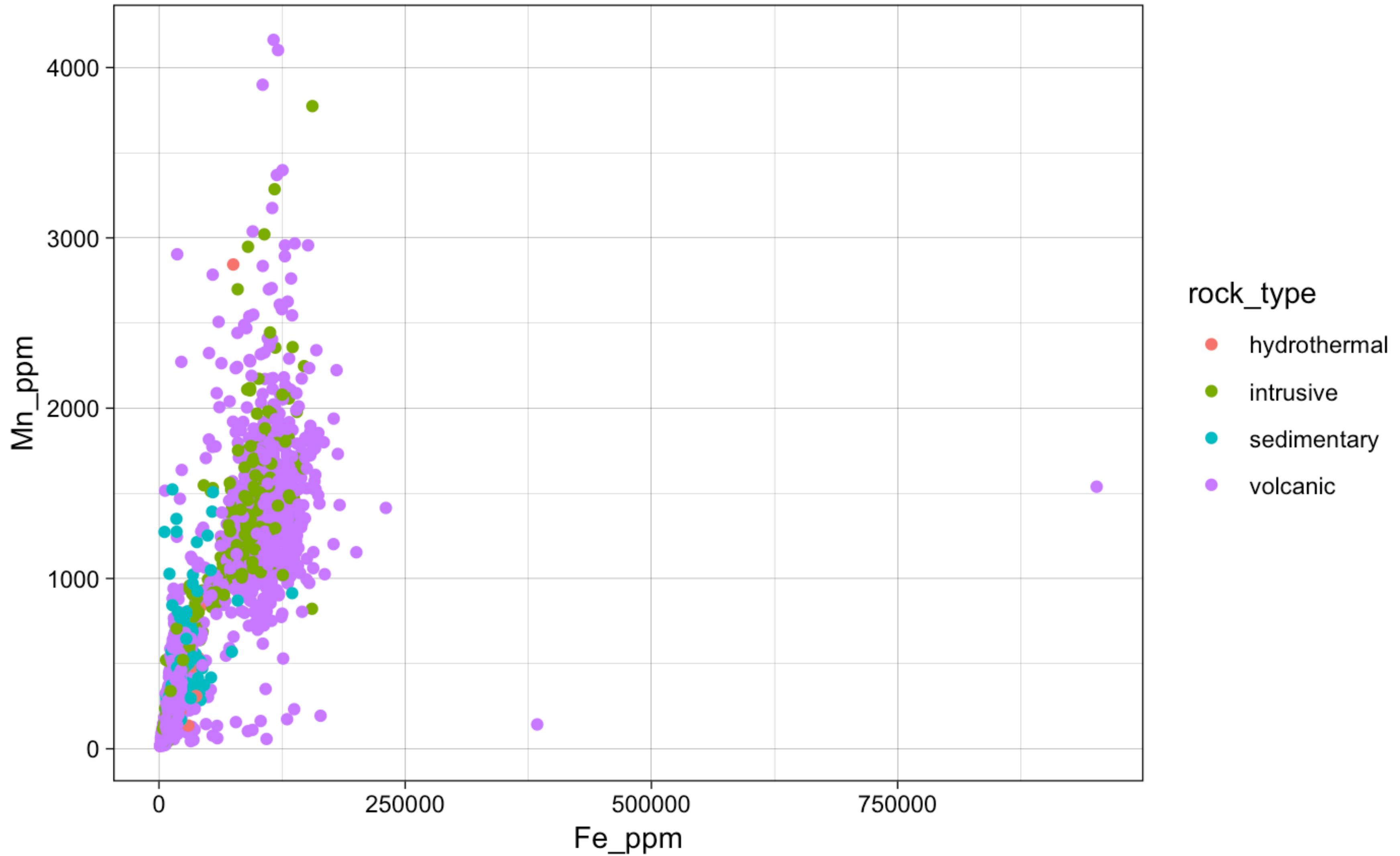
```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type)) +  
  theme_light()
```



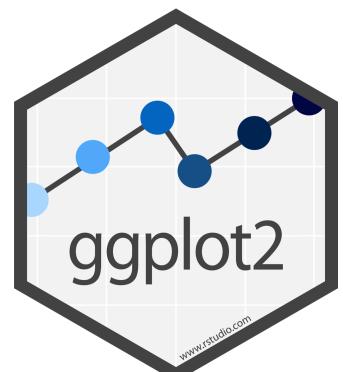


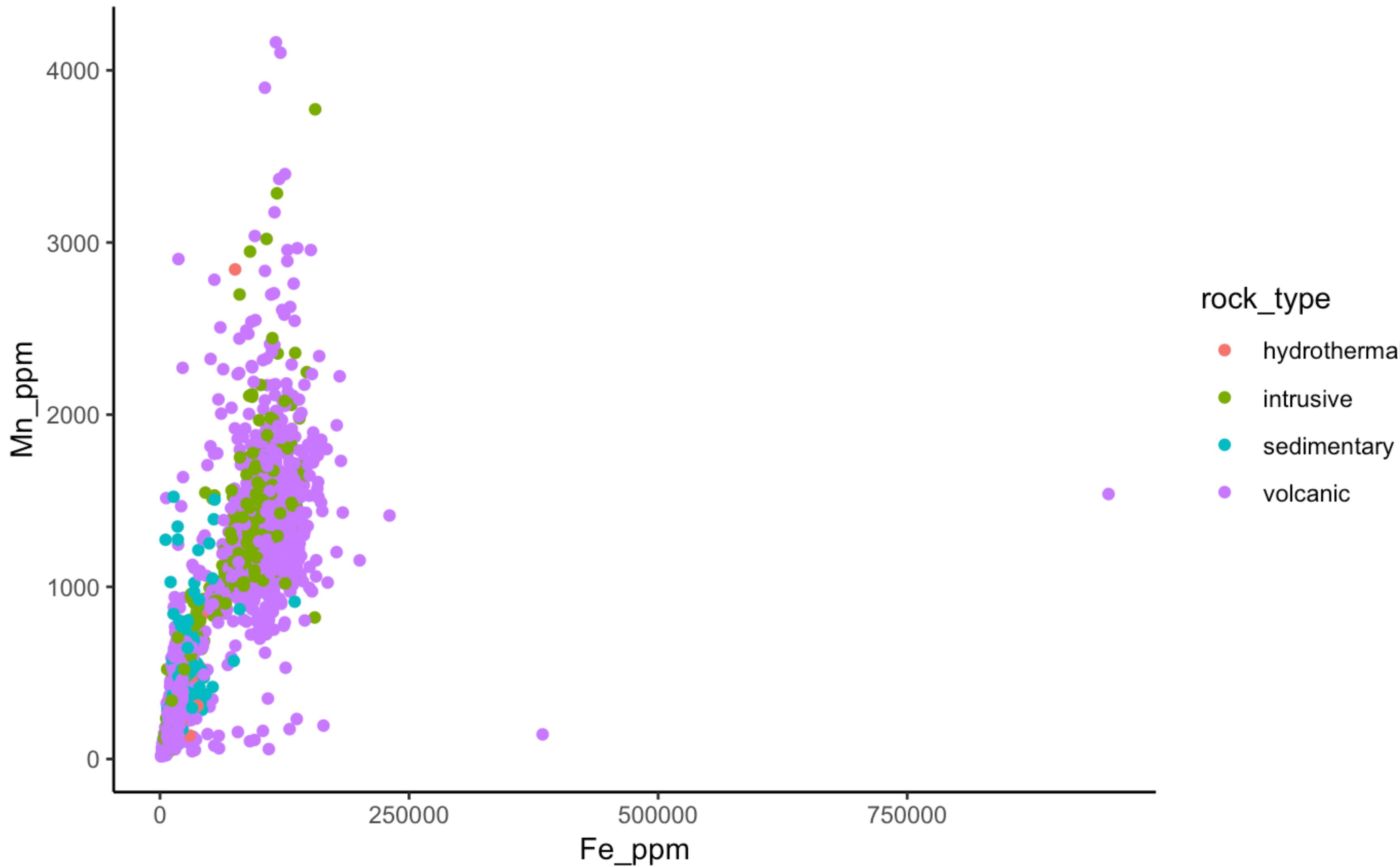
```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type)) +  
  theme_minimal()
```



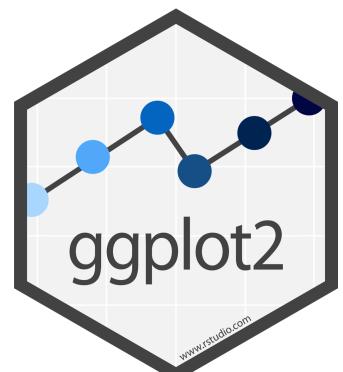


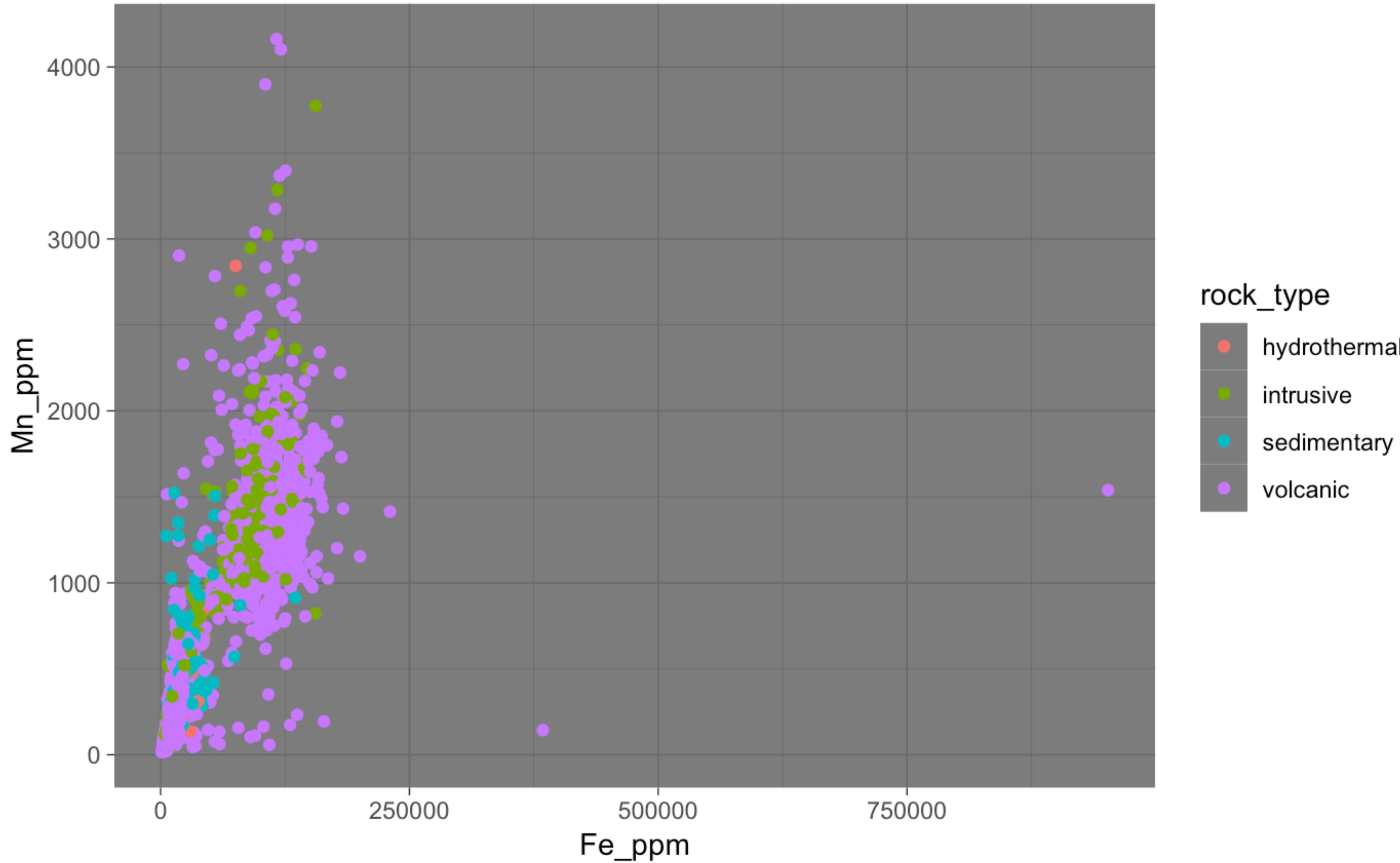
```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type)) +  
  theme_linedraw()
```



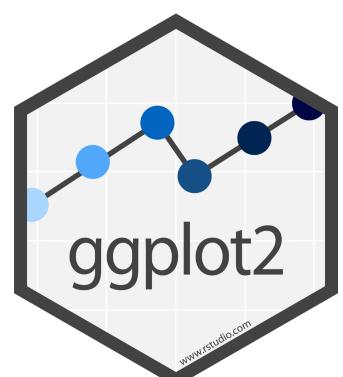


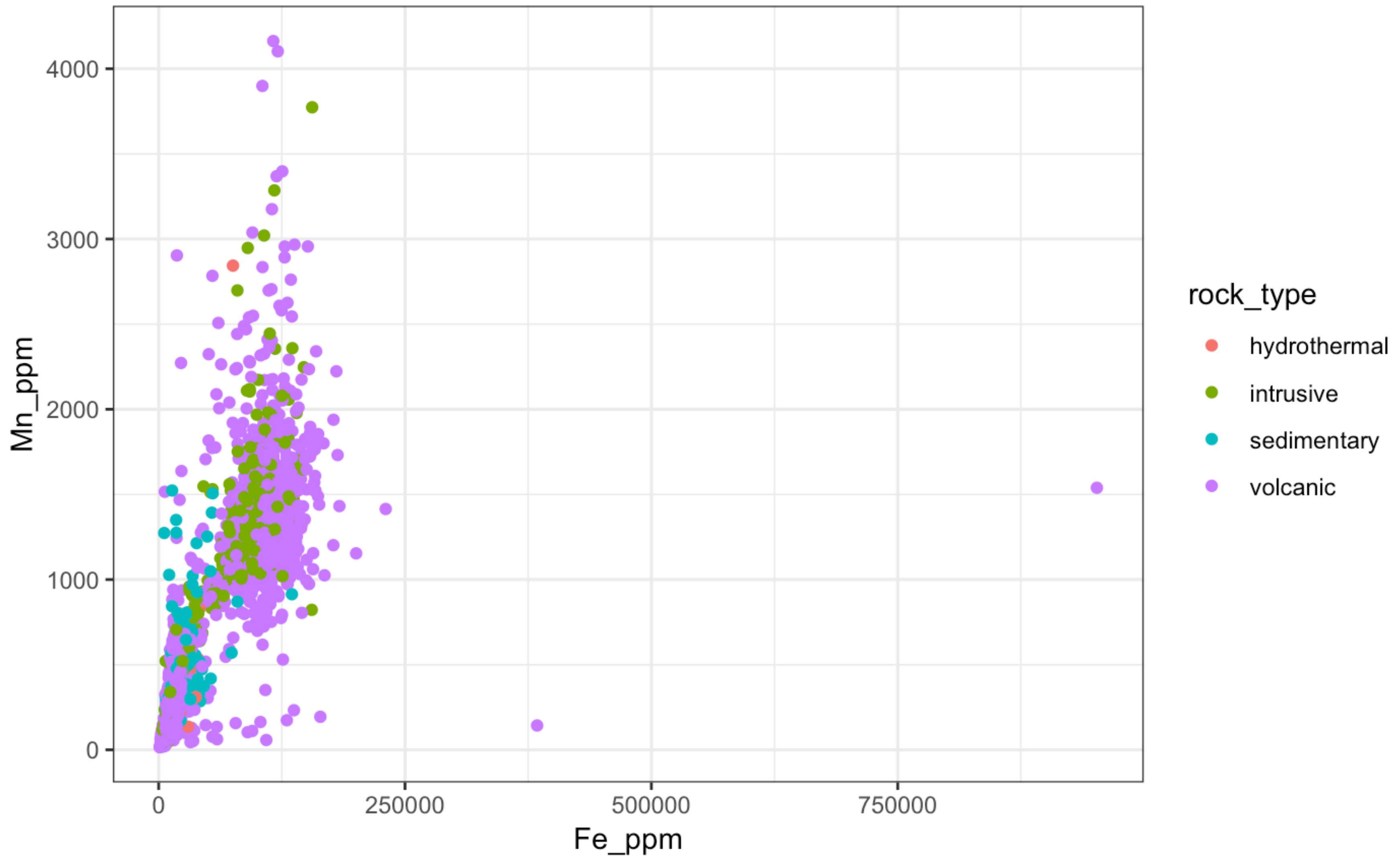
```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type)) +  
  theme_classic()
```



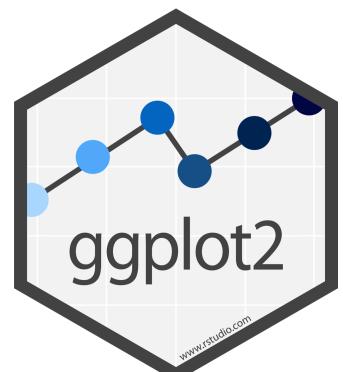


```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type)) +  
  theme_dark()
```



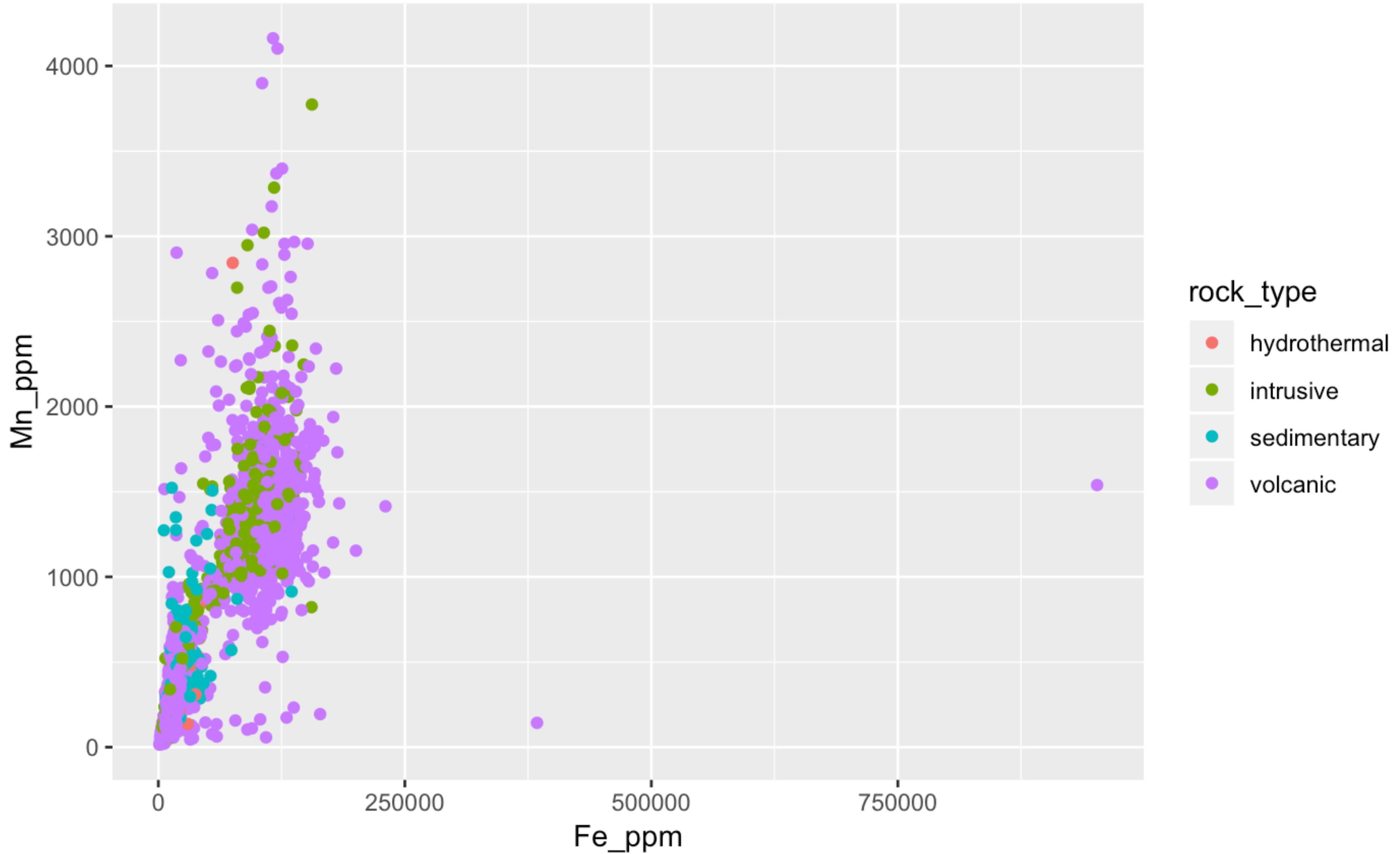


```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type)) +  
  theme_bw()
```

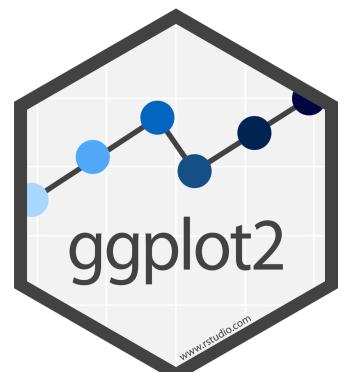


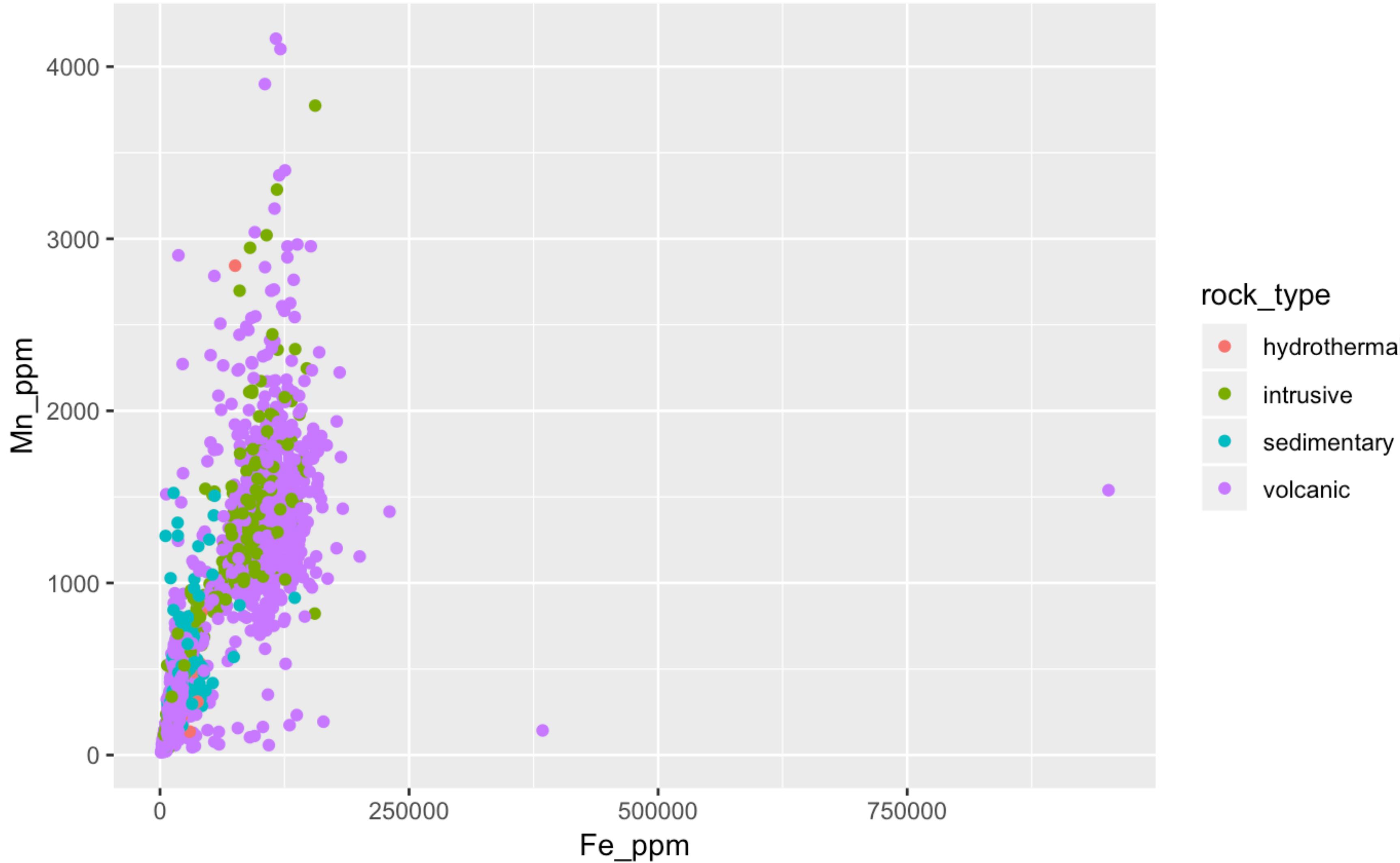
Color Scales

R

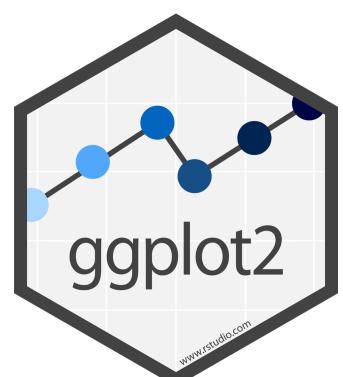


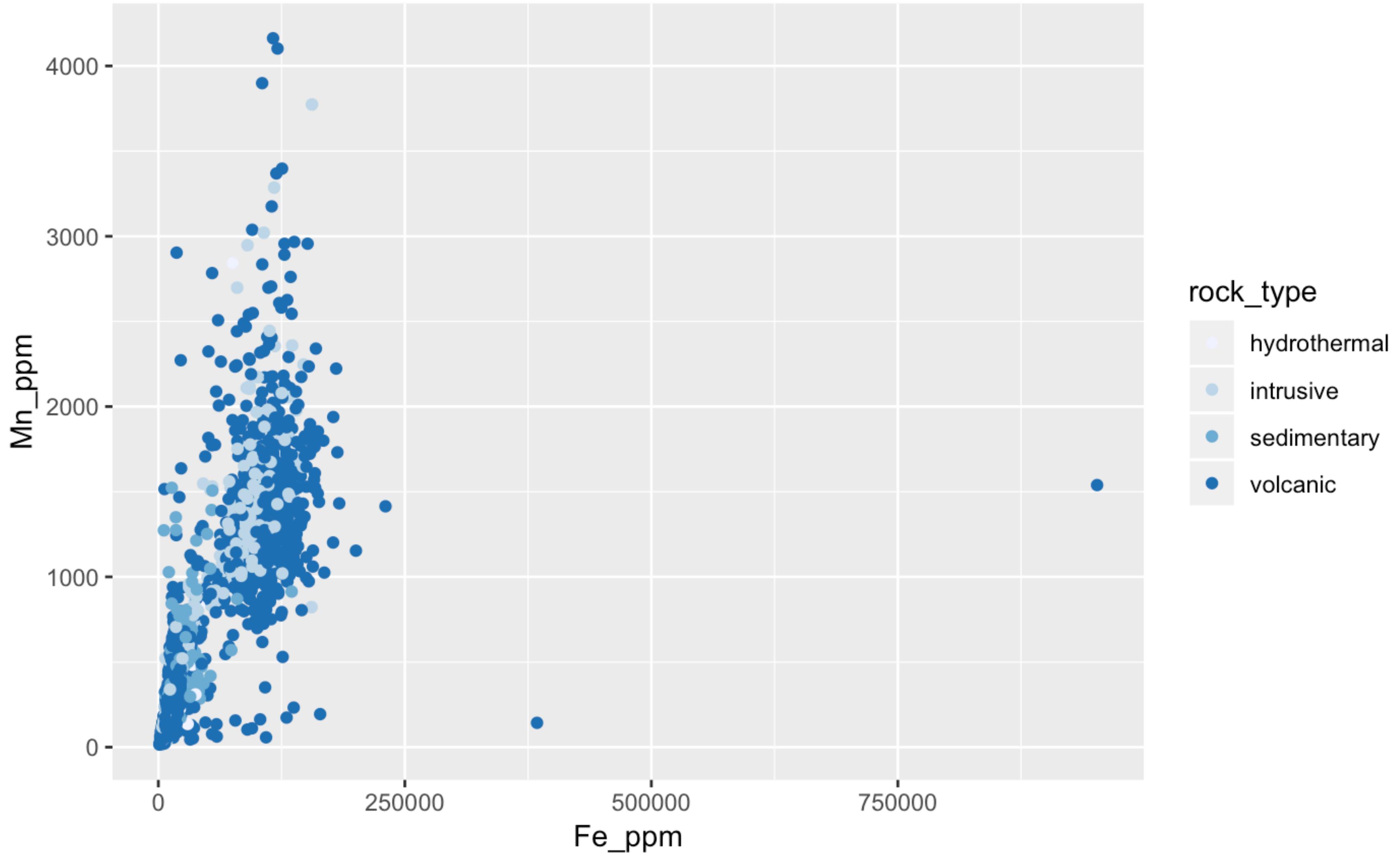
```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type))
```



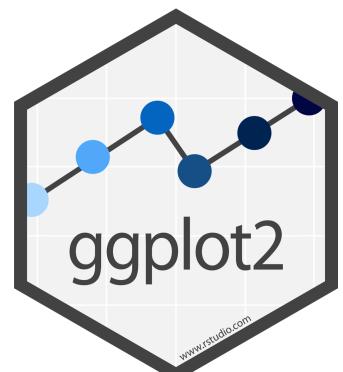


```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type)) +  
  scale_color_discrete()
```





```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type)) +  
  scale_color_brewer()
```

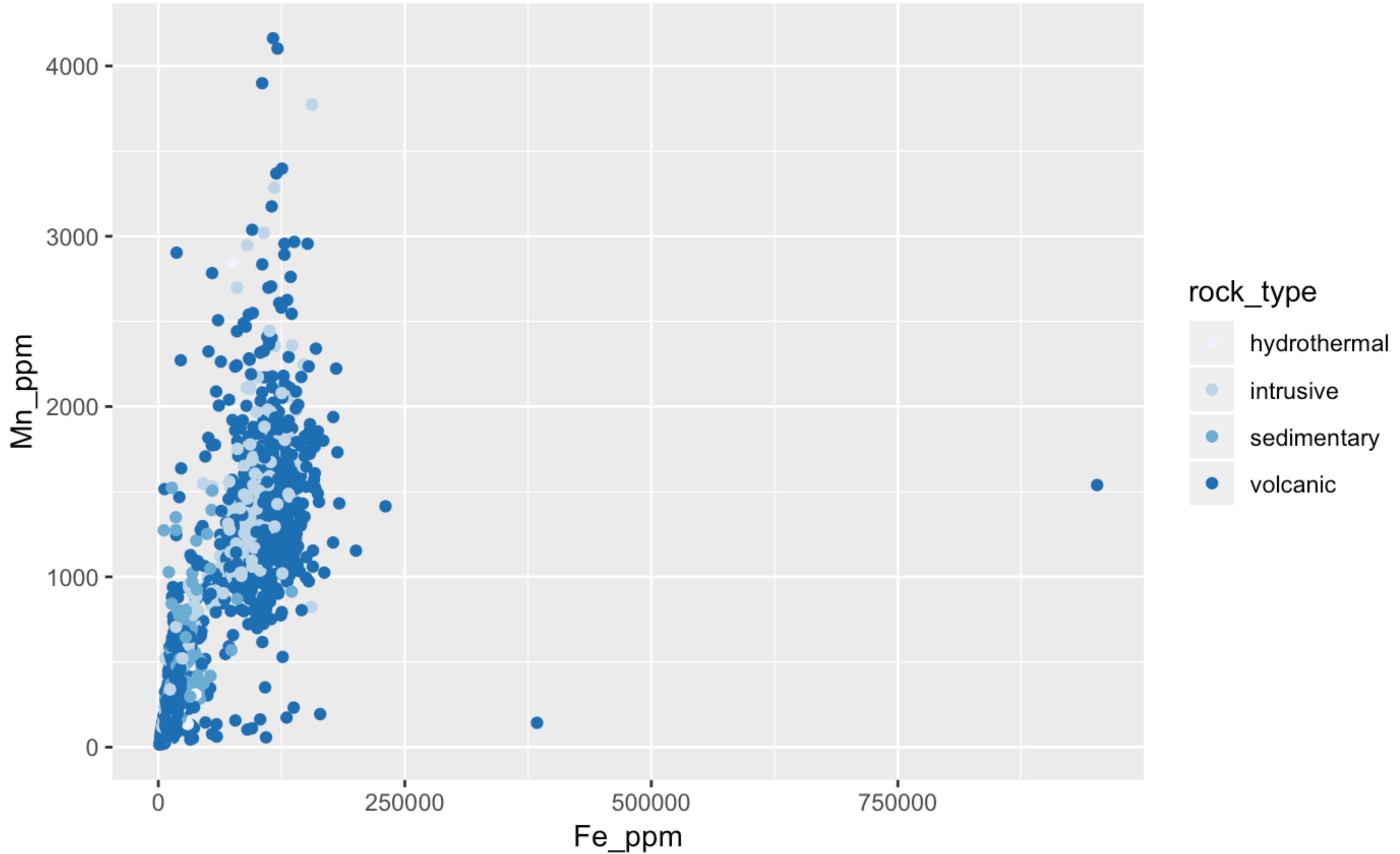


Exercise 2

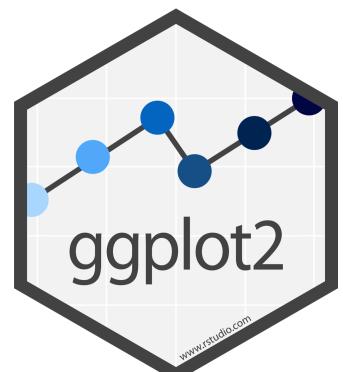
Modify the following code to use `scale_color_brewer()`. Experiment with the `palette` argument (see the "Palettes" section of the help file `?scale_color_brewer`) to change the colors (Hint: try "Spectral").

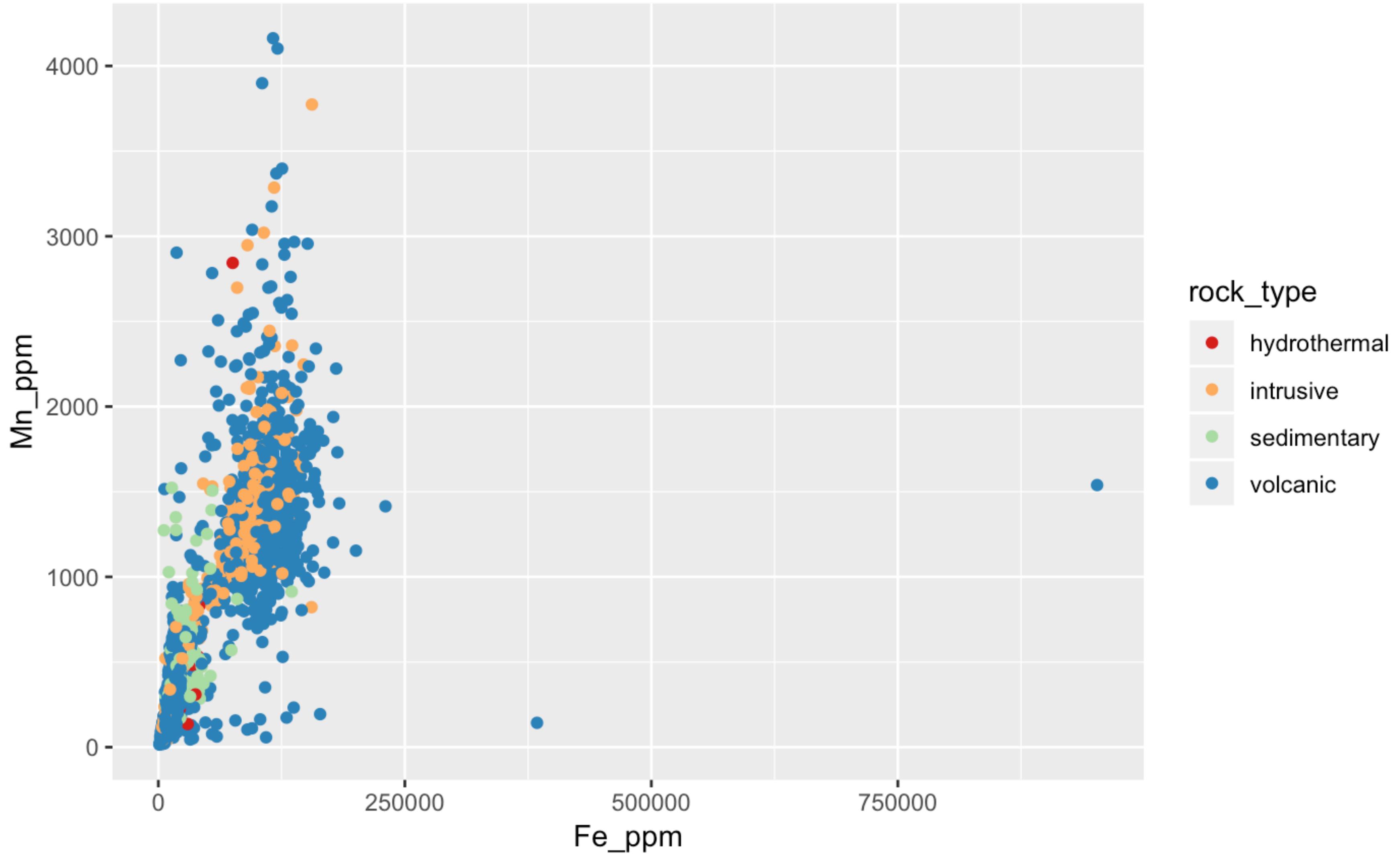
```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type))
```



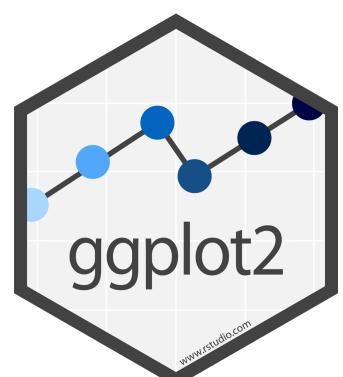


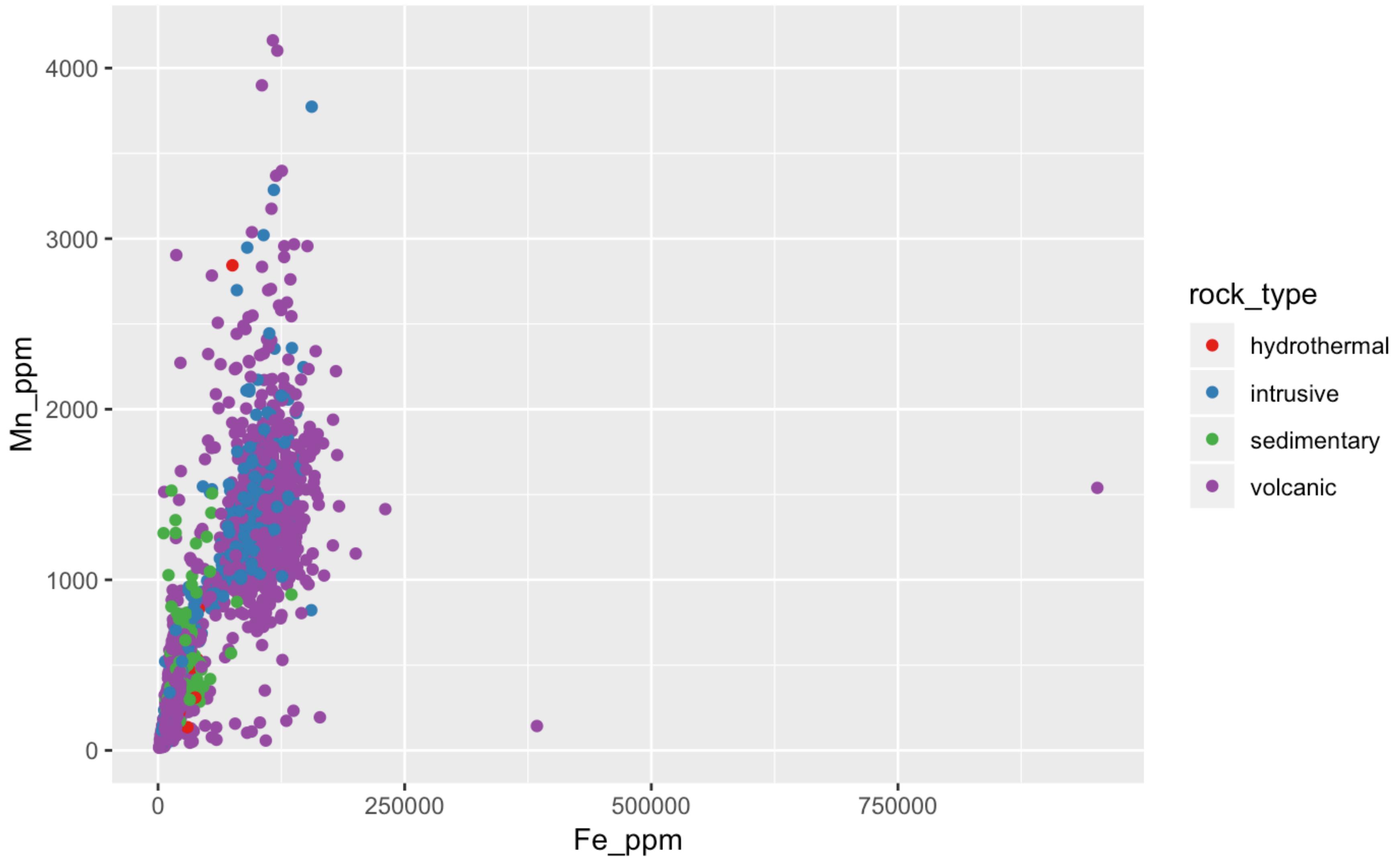
```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type)) +  
  scale_color_brewer(palette = "Blues")
```



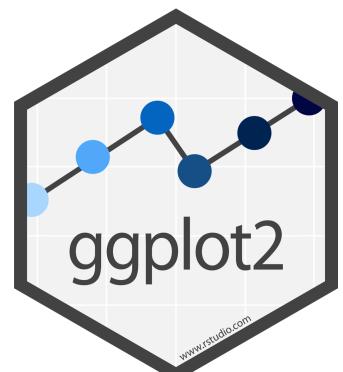


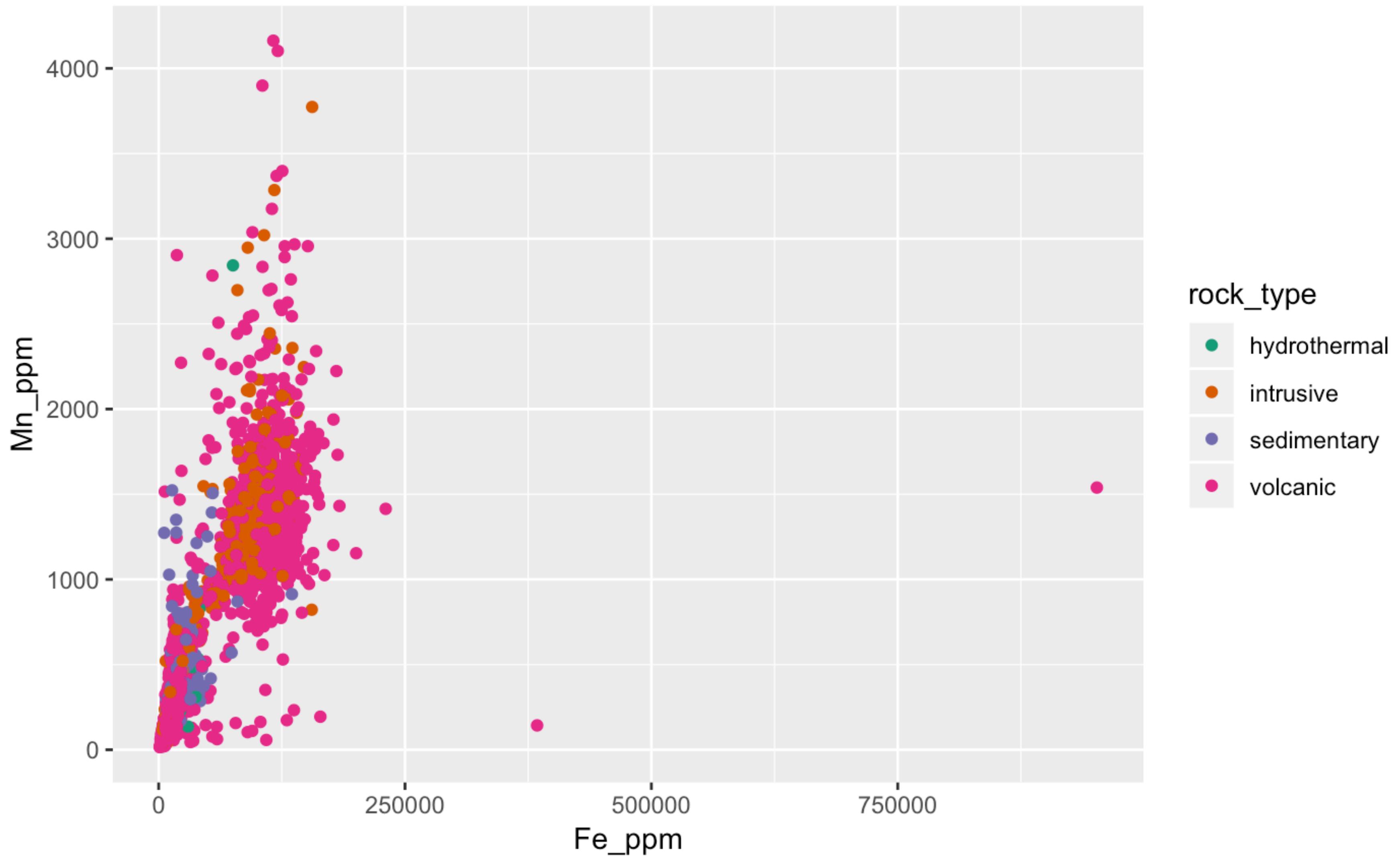
```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type)) +  
  scale_color_brewer(palette = "Spectral")
```



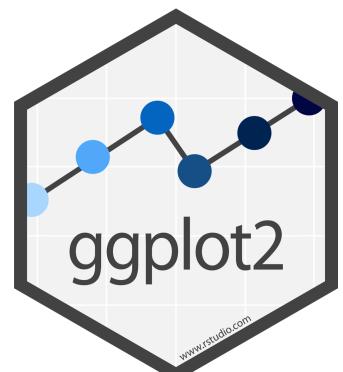


```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type)) +  
  scale_color_brewer(palette = "Set1")
```





```
ggplot(warwick) +  
  geom_point(aes(x = Fe_ppm, y = Mn_ppm, color = rock_type)) +  
  scale_color_brewer(palette = "Dark1")
```

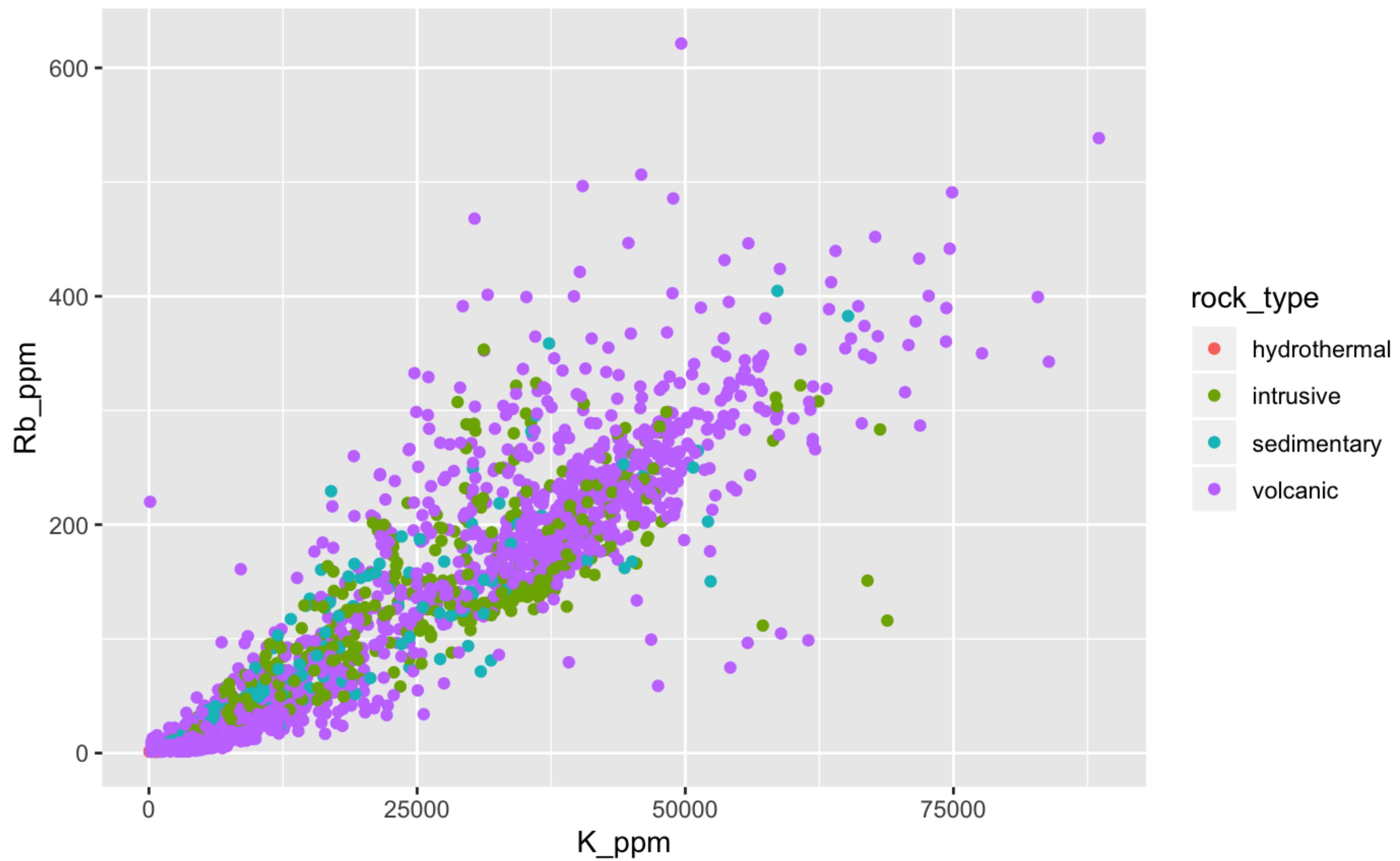


Exercise 3

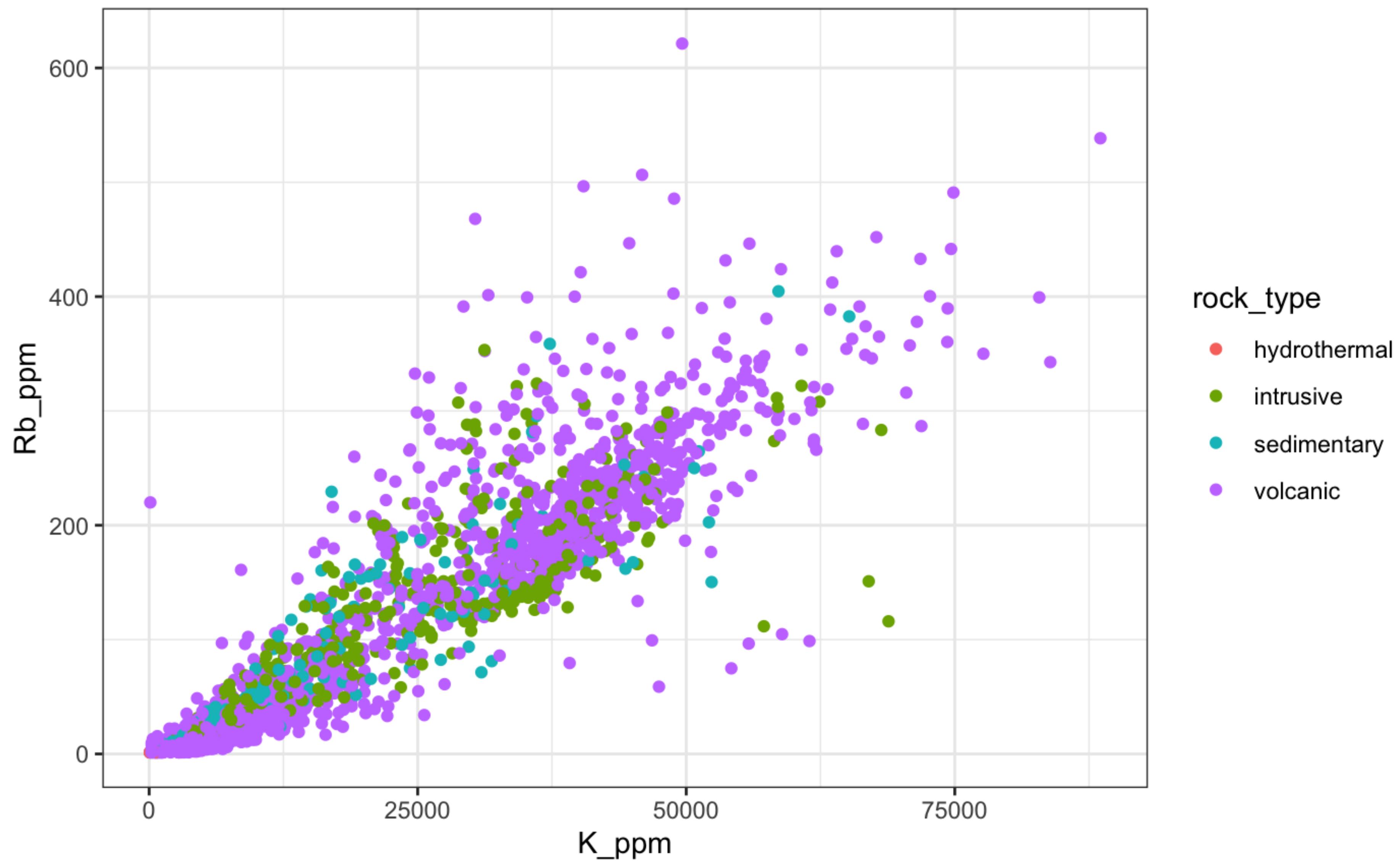
Create a scatterplot of `warwick` using the `K_ppm` and `Rb_ppm` variables, colored by `rock_type`. Apply your favourite built-in theme, and your favorite color scale using `scale_color_brewer()`.



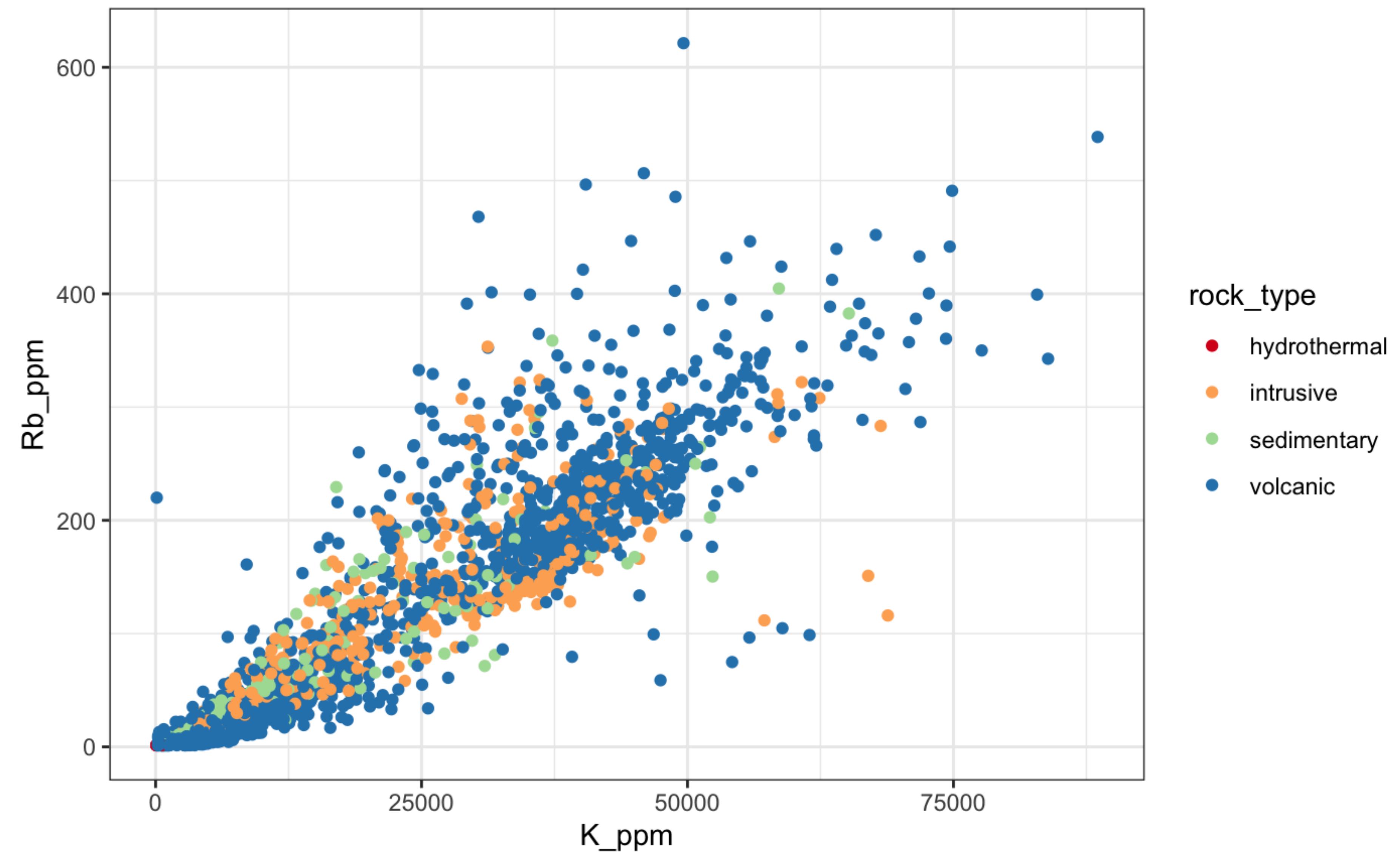
ggplot(warwick)



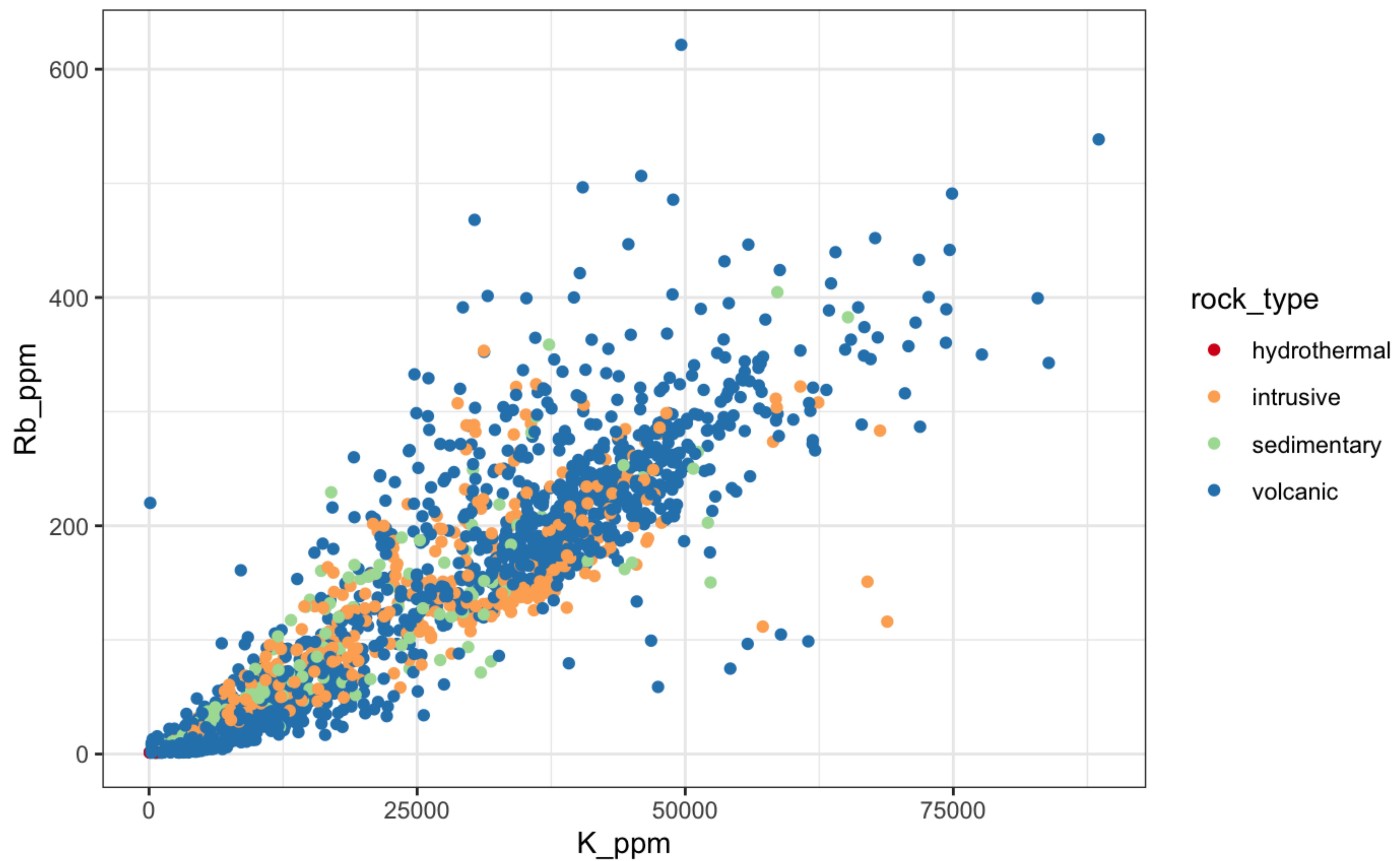
```
ggplot(warwick) +  
  geom_point(aes(x = K_ppm, y = Rb_ppm, color = rock_type))
```



```
ggplot(warwick) +  
  geom_point(aes(x = K_ppm, y = Rb_ppm, color = rock_type)) +  
  theme_bw()
```



```
ggplot(warwick) +  
  geom_point(aes(x = K_ppm, y = Rb_ppm, color = rock_type)) +  
  theme_bw() +  
  scale_color_brewer(palette = "Spectral")
```



Customizing Plots with

