```
4-APR-86

                          *   *  *         *      * *      *     *
                          *   *  *****     *     *   *     *     *****
                          *   *      *     *     *****     *         *
                          ****   *****     *     *   *     *     *****

                    A PROGRAM IN THE Q'GAS SYSTEM TO CALCULATE
                    UNIVARIATE STATISTICS AND DISPLAY HISTOGRAMS

                 Version 5.0                               January 1985

                 Copyright O.P. Lavin & Associates and Queen's Univer-
                 sity, unpublished.  This material is confidential and
                 is not to be reproduced or distributed in whole or in
                 part without the consent of O.P. Lavin and Associates
                 and Queen's University.   Q'GAS is a registered trade
                 mark of Queen's University.


DATA TITLE:     MT ARMOUR 1985 SOIL GEOCHEMISTRY


THE FOLLOWING VARIABLES ARE IN THE DATA SET:

 NORTH     EAST      AG        AS        CU        PB        ZN        AUPPB
```

092P/01

```
DATA TITLE  :  MT ARMOUR 1985 SOIL GEOCHEMISTRY
VARIABLE  :  AUPPB
                                                          NUMBER OF    PERCENTAGE OF   CUMULATIVE    LOWER
                                                          SAMPLES IN    THE TOTAL     PERCENT BELOW  BOUND
                                                         THIS CATEGORY   SAMPLES      LOWER BOUND
 LOWER               PERCENT OF THE TOTAL SAMPLES
 BOUND
INCLUDED |     15.0      30.0      45.0      60.0      75.0
   0.000|---------+---------+---------+---------+---------+                              0.00    0.000
        |*****************************************                 798          61.76
        |*****************************************
  10.000|                                                                               61.76   10.000
        |*****************                                         338          26.16
        |*****************
  20.000|                                                                               87.93   20.000
        |***                                                        52           4.02
        |***
  30.000|                                                                               91.95   30.000
        |*                                                          26           2.01
        |*
  40.000|                                                                               93.96   40.000
        |*                                                          20           1.55
        |*
  50.000|                                                                               95.51   50.000
        |I                                                          15           1.16
  60.000|                                                                               96.67   60.000
        |I                                                           7           0.54
  70.000|                                                                               97.21   70.000
        |I                                                           3           0.23
  80.000|                                                                               97.45   80.000
        |I                                                           3           0.23
  90.000|                                                                               97.68   90.000
        |I                                                           2           0.15
 100.000|                                                                               97.83  100.000
        |I                                                           4           0.31
 110.000|                                                                               98.14  110.000
        |I                                                           2           0.15
 120.000|                                                                               98.30  120.000
        |I                                                           3           0.23
 130.000|                                                                               98.53  130.000
        |                                                            0           0.00
 140.000|                                                                               98.53  140.000
        |                                                            0           0.00
 150.000|                                                                               98.53  150.000
```

92% < 30ppb

95% < 50ppb

```
                                                          0        0.00
  160.000|                                                                      98.53   160.000
         |I                                               1        0.08
  170.000|I                                                                     98.61   170.000
         |I                                               1        0.08
  180.000|I                                                                     98.68   180.000
         |I                                               1        0.08
  190.000|I                                                                     98.76   190.000
         |                                                0        0.00
  200.000|                                                                      98.76   200.000
         |                                                0        0.00
  210.000|                                                                      98.76   210.000
         |                                                0        0.00
  220.000|                                                                      98.76   220.000
         |I                                               1        0.08
  230.000|I                                                                     98.84   230.000
         |                                                0        0.00
  240.000|                                                                      98.84   240.000
         |I                                               2        0.15
  250.000|I                                                                     98.99   250.000
         |                                                0        0.00
  260.000|                                                                      98.99   260.000
         |                                                0        0.00
  270.000|                                                                      98.99   270.000
         |I                                               2        0.15
  280.000|I                                                                     99.15   280.000
         |I                                               1        0.08
  290.000|I                                                                     99.23   290.000
         |                                                0        0.00
  300.000|                                                                      99.23   300.000
         |                                                0        0.00
  310.000|                                                                      99.23   310.000
         |                                                0        0.00
  320.000|                                                                      99.23   320.000
         |I                                               1        0.08
  330.000|I                                                                     99.30   330.000
         |                                                0        0.00
  340.000|                                                                      99.30   340.000
         |                                                0        0.00
  350.000|                                                                      99.30   350.000
         |                                                0        0.00
  360.000|                                                                      99.30   360.000
         |                                                0        0.00
  370.000|                                                                      99.30   370.000
         |                                                0        0.00
  380.000|                                                                      99.30   380.000
         |I                                               1        0.08
  390.000|I                                                                     99.38   390.000
         |I                                               2        0.15
         |I
         |---------+---------+---------+---------+---------+


          DATA  ABOVE  RANGE  OF  HISTOGRAM
  500.000|                                                                      99.54   500.000
         |I                                               6        0.46
         |---------+---------+---------+---------+---------+
         |        15.0      30.0      45.0      60.0      75.0

                    PERCENT OF THE TOTAL SAMPLES


VARIABLE:                   AUPPB
NUMBER OF OBSERVATIONS:       1292
MINIMUM:                     3.000
MAXIMUM:                  2230.000
MEAN:                       18.893
STANDARD ERROR OF MEAN:      2.687
STANDARD DEVIATION:         96.590
COEFFICIENT OF VARIATION:  511.245
SKEWNESS:                   15.995
KURTOSIS:                  303.928
**********************************************************************************************************************
        WE WILL NOW MAKE ANOTHER PASS THROUGH THE DATA.

        THE SAME TRANSFORMATIONS AND SELECTIONS AS LAST RUN WILL BE USED IN THIS RUN.
```

```
DATA TITLE  :   MT ARMOUR 1985 SOIL GEOCHEMISTRY
VARIABLE  :  AG
                                                           NUMBER OF    PERCENTAGE OF  CUMULATIVE     LOWER
                                                           SAMPLES IN     THE TOTAL    PERCENT BELOW  BOUND
                                                          THIS CATEGORY    SAMPLES      LOWER BOUND
  LOWER                PERCENT OF THE TOTAL SAMPLES
  BOUND
INCLUDED  |       15.0      30.0      45.0      60.0      75.0
          |---------+---------+---------+---------+---------+
    0.000|                                                                      0.00    0.000
         |***                                              62        4.80
    0.500|***                                                                   4.80    0.500
         |***********************************             672       52.01
    1.000|***********************************                                  56.81    1.000
         |*************************                       494       38.24
    1.500|*************************                                            95.05    1.500
         |**                                               43        3.33
    2.000|**                                                                   98.37    2.000
         |I                                                13        1.01
    2.500|I                                                                    99.38    2.500
         |                                                  0        0.00
    3.000|                                                                     99.38    3.000
         |I                                                 3        0.23
    3.500|I                                                                    99.61    3.500
         |I                                                 2        0.15
    4.000|I                                                                    99.77    4.000
         |                                                  0        0.00
    4.500|                                                                     99.77    4.500
         |I                                                 1        0.08
    5.000|I                                                                    99.85    5.000
         |I                                                 1        0.08
    5.500|I                                                                    99.92    5.500
         |I                                                 1        0.08
         |I
         |---------+---------+---------+---------+---------+
         |        15.0      30.0      45.0      60.0      75.0

                   PERCENT OF THE TOTAL SAMPLES


VARIABLE:                  AG
NUMBER OF OBSERVATIONS:      1292
MINIMUM:                    0.100
MAXIMUM:                    5.600
MEAN:                       0.940
STANDARD ERROR OF MEAN:     0.011
STANDARD DEVIATION:         0.394
COEFFICIENT OF VARIATION:  41.950
SKEWNESS:                   3.983
KURTOSIS:                  35.776
*********************************************************************************************************************
        WE WILL NOW MAKE ANOTHER PASS THROUGH THE DATA.

        THE SAME TRANSFORMATIONS AND SELECTIONS AS LAST RUN WILL BE USED IN THIS RUN.
```

$\bar{x}$ = 0.94 ppm

σ = 0.39

$\bar{x} + \sigma$ = 1.33 ppm

$\bar{x} + 2\sigma$ = 1.72 ppm

```
DATA TITLE  :  MT ARMOUR 1985 SOIL GEOCHEMISTRY
VARIABLE  :  PB
                                                                  NUMBER OF   PERCENTAGE OF  CUMULATIVE     LOWER
                                                                  SAMPLES IN    THE TOTAL   PERCENT BELOW   BOUND
                                                                 THIS CATEGORY   SAMPLES     LOWER BOUND
  LOWER                PERCENT OF THE TOTAL SAMPLES
  BOUND
INCLUDED  |       10.0      20.0      30.0      40.0      50.0
          |---------+---------+---------+---------+---------+
     0.000|                                                                                       0.00     0.000
          |***                                                       36           2.79
    10.000|                                                                                       2.79    10.000
          |*************************                                322          24.92
    20.000|                                                                                      27.71    20.000
          |*******************************                          399          30.88
    30.000|                                                                                      58.59    30.000
          |*****************                                        216          16.72
    40.000|                                                                                      75.31    40.000
          |**********                                               127           9.83
    50.000|                                                                                      85.14    50.000
          |******                                                    72           5.57
    60.000|                                                                                      90.71    60.000
          |****                                                      46           3.56
    70.000|                                                                                      94.27    70.000
          |**                                                        23           1.78
    80.000|                                                                                      96.05    80.000
          |*                                                         14           1.08
    90.000|                                                                                      97.14    90.000
          |I                                                         12           0.93
   100.000|                                                                                      98.07   100.000
          |I                                                          3           0.23
   110.000|                                                                                      98.30   110.000
          |I                                                          4           0.31
   120.000|                                                                                      98.61   120.000
          |I                                                          2           0.15
   130.000|                                                                                      98.76   130.000
          |I                                                          1           0.08
   140.000|                                                                                      98.84   140.000
          |I                                                          2           0.15
   150.000|                                                                                      98.99   150.000
          |I                                                          5           0.39
   160.000|                                                                                      99.38   160.000
          |                                                           0           0.00
   170.000|                                                                                      99.38   170.000
          |I                                                          1           0.08
   180.000|                                                                                      99.46   180.000
          |                                                           0           0.00
   190.000|                                                                                      99.46   190.000
          |I                                                          1           0.08
   200.000|                                                                                      99.54   200.000
          |                                                           0           0.00
   210.000|                                                                                      99.54   210.000
          |                                                           0           0.00
   220.000|                                                                                      99.54   220.000
          |I                                                          1           0.08
   230.000|                                                                                      99.61   230.000
          |                                                           0           0.00
   240.000|                                                                                      99.61   240.000
          |                                                           0           0.00
   250.000|                                                                                      99.61   250.000
          |I                                                          1           0.08
   260.000|                                                                                      99.69   260.000
          |                                                           0           0.00
   270.000|                                                                                      99.69   270.000
          |                                                           0           0.00
   280.000|                                                                                      99.69   280.000
          |                                                           0           0.00
   290.000|                                                                                      99.69   290.000
          |I                                                          1           0.08
   300.000|                                                                                      99.77   300.000
          |                                                           0           0.00
   310.000|                                                                                      99.77   310.000
          |                                                           0           0.00
   320.000|                                                                                      99.77   320.000
          |                                                           0           0.00
   330.000|                                                                                      99.77   330.000
          |I                                                          1           0.08
          |---------+---------+---------+---------+---------+

           DATA  ABOVE  RANGE  OF  HISTOGRAM
   500.000|                                                                                      99.85   500.000
          |I                                                          2           0.15
          |---------+---------+---------+---------+---------+
          |        10.0      20.0      30.0      40.0      50.0
                       PERCENT OF THE TOTAL SAMPLES
```

$\bar{x} = 33.7$

$\sigma = 33$

$\bar{x} + \sigma = 67$

$\bar{x} + 2\sigma = 100$.

```
VARIABLE:                      PB
NUMBER OF OBSERVATIONS:          1292
MINIMUM:                        3.000
MAXIMUM:                      578.000
MEAN:                          33.673
STANDARD ERROR OF MEAN:         0.914
STANDARD DEVIATION:            32.847
COEFFICIENT OF VARIATION:      97.546
SKEWNESS:                       8.454
KURTOSIS:                     114.130
*********************************************************************************************************************
        WE WILL NOW MAKE ANOTHER PASS THROUGH THE DATA.

        THE SAME TRANSFORMATIONS AND SELECTIONS AS LAST RUN WILL BE USED IN THIS RUN.
```

```
DATA TITLE  :   MT ARMOUR 1985 SOIL GEOCHEMISTRY
VARIABLE  :  CU
                                                                                 NUMBER OF    PERCENTAGE OF   CUMULATIVE     LOWER
                                                                                 SAMPLES IN    THE TOTAL    PERCENT BELOW   BOUND
                                                                                THIS CATEGORY    SAMPLES     LOWER BOUND
  LOWER                   PERCENT OF THE TOTAL SAMPLES
  BOUND
INCLUDED  |      10.0      20.0      30.0      40.0      50.0
          |---------+---------+---------+---------+---------+
     0.000|                                                                                                      0.00     0.000
          |************************                                      312           24.15
    20.000|                                                                                                     24.15    20.000
          |****************************************                      512           39.63
    40.000|                                                                                                     63.78    40.000
          |*****************                                             214           16.56
    60.000|                                                                                                     80.34    60.000
          |********                                                      107            8.28
    80.000|                                                                                                     88.62    80.000
          |*****                                                          60            4.64
   100.000|                                                                                                     93.27   100.000
          |**                                                             28            2.17
   120.000|                                                                                                     95.43   120.000
          |*                                                              16            1.24
   140.000|                                                                                                     96.67   140.000
          |*                                                              16            1.24
   160.000|                                                                                                     97.91   160.000
          |I                                                               6            0.46
   180.000|                                                                                                     98.37   180.000
          |I                                                               3            0.23
   200.000|                                                                                                     98.61   200.000
          |I                                                               4            0.31
   220.000|                                                                                                     98.92   220.000
          |I                                                               3            0.23
   240.000|                                                                                                     99.15   240.000
          |I                                                               3            0.23
   260.000|                                                                                                     99.38   260.000
          |I                                                               1            0.08
   280.000|                                                                                                     99.46   280.000
          |                                                                0            0.00
   300.000|                                                                                                     99.46   300.000
          |I                                                               1            0.08
   320.000|                                                                                                     99.54   320.000
          |I                                                               1            0.08
   340.000|                                                                                                     99.61   340.000
          |                                                                0            0.00
   360.000|                                                                                                     99.61   360.000
          |I                                                               2            0.15
   380.000|                                                                                                     99.77   380.000
          |                                                                0            0.00
   400.000|                                                                                                     99.77   400.000
          |I                                                               1            0.08
   420.000|                                                                                                     99.85   420.000
          |                                                                0            0.00
   440.000|                                                                                                     99.85   440.000
          |                                                                0            0.00
   460.000|                                                                                                     99.85   460.000
          |                                                                0            0.00
   480.000|                                                                                                     99.85   480.000
          |I                                                               2            0.15
          |---------+---------+---------+---------+---------+
          |      10.0      20.0      30.0      40.0      50.0
                          PERCENT OF THE TOTAL SAMPLES


 VARIABLE:                       CU
 NUMBER OF OBSERVATIONS:          1292
 MINIMUM:                        7.000
 MAXIMUM:                      499.000
 MEAN:                          43.779
 STANDARD ERROR OF MEAN:         1.210
 STANDARD DEVIATION:            43.478
 COEFFICIENT OF VARIATION:      99.312
 SKEWNESS:                       4.377
 KURTOSIS:                      30.080
****************************************************************************************************************
        WE WILL NOW MAKE ANOTHER PASS THROUGH THE DATA.

        THE SAME TRANSFORMATIONS AND SELECTIONS AS LAST RUN WILL BE USED IN THIS RUN.

DATA TITLE  :   MT ARMOUR 1985 SOIL GEOCHEMISTRY
VARIABLE  :  ZN
                                                                                 NUMBER OF    PERCENTAGE OF   CUMULATIVE     LOWER
                                                                                 SAMPLES IN    THE TOTAL    PERCENT BELOW   BOUND
                                                                                THIS CATEGORY    SAMPLES     LOWER BOUND
  LOWER                   PERCENT OF THE TOTAL SAMPLES
  BOUND
INCLUDED  |      10.0      20.0      30.0      40.0      50.0
          |---------+---------+---------+---------+---------+
     0.000|                                                                                                      0.00     0.000
          |I                                                               3            0.23
    50.000|                                                                                                      0.23    50.000
          |****************************                                  365           28.25
   100.000|                                                                                                     28.48   100.000
          |*************************                                     317           24.54
   150.000|                                                                                                     53.02   150.000
          |**************                                                177           13.70
   200.000|                                                                                                     66.72   200.000
          |***********                                                   136           10.53
   250.000|                                                                                                     77.24   250.000
          |******                                                         80            6.19
   300.000|                                                                                                     83.44   300.000
          |****                                                           48            3.72
   350.000|                                                                                                     87.15   350.000
          |**                                                             32            2.48
   400.000|                                                                                                     89.63   400.000
          |**                                                             21            1.63
   450.000|                                                                                                     91.25   450.000
          |**                                                             20            1.55
   500.000|                                                                                                     92.80   500.000
          |**                                                             20            1.55
   550.000|                                                                                                     94.35   550.000
          |*                                                              13            1.01
   600.000|                                                                                                     95.36   600.000
          |I                                                               7            0.54
   650.000|                                                                                                     95.90   650.000
          |I                                                               8            0.62
   700.000|                                                                                                     96.52   700.000
          |I                                                               9            0.70
   750.000|                                                                                                     97.21   750.000
          |I                                                               8            0.62
   800.000|                                                                                                     97.83   800.000
          |I                                                               2            0.15
   850.000|                                                                                                     97.99   850.000
          |I                                                               3            0.23
   900.000|                                                                                                     98.22   900.000
          |I                                                               5            0.39
   950.000|                                                                                                     98.61   950.000
          |I                                                               3            0.23
  1000.000|                                                                                                     98.84  1000.000
          |I                                                               2            0.15
  1050.000|                                                                                                     98.99  1050.000
          |I                                                               1            0.08
  1100.000|                                                                                                     99.07  1100.000
          |I                                                               1            0.08
  1150.000|                                                                                                     99.15  1150.000
          |I                                                               4            0.31
  1200.000|                                                                                                     99.46  1200.000
          |                                                                0            0.00
  1250.000|                                                                                                     99.46  1250.000
          |I                                                               1            0.08
  1300.000|                                                                                                     99.54  1300.000
          |I                                                               1            0.08
  1350.000|                                                                                                     99.61  1350.000
          |I                                                               1            0.08
  1400.000|                                                                                                     99.69  1400.000
```

95.4% < 120ppm

98% < 160ppm

93% < 500ppm

98% < 850ppm

```
  1450.000|                                           0          0.00
          |                                                                    99.69  1450.000
  1500.000|                                           0          0.00
          |                                                                    99.69  1500.000
  1550.000|                                           0          0.00
          |I                                                                   99.69  1550.000
  1600.000|I                                          1          0.08
          |                                                                    99.77  1600.000
  1650.000|                                           0          0.00
          |                                                                    99.77  1650.000
  1700.000|                                           0          0.00
          |                                                                    99.77  1700.000
  1750.000|                                           0          0.00
          |                                                                    99.77  1750.000
  1800.000|                                           0          0.00
          |                                                                    99.77  1800.000
  1850.000|                                           0          0.00
          |I                                                                   99.77  1850.000
  1900.000|I                                          1          0.08
          |                                                                    99.85  1900.000
  1950.000|                                           0          0.00
          |I                                                                   99.85  1950.000
          |I                                          1          0.08
          |---------+---------+---------+---------+---------+

           DATA  ABOVE  RANGE  OF  HISTOGRAM
  2500.000|                                                                    99.92  2500.000
          |I
          |I                                          1          0.08
          |---------+---------+---------+---------+---------+
          |       10.0      20.0      30.0      40.0      50.0
                      PERCENT OF THE TOTAL SAMPLES


VARIABLE:                    ZN
NUMBER OF OBSERVATIONS:         1292
MINIMUM:                      30.000
MAXIMUM:                    4210.000
MEAN:                        210.068
STANDARD ERROR OF MEAN:        6.253
STANDARD DEVIATION:          224.763
COEFFICIENT OF VARIATION:    106.995
SKEWNESS:                      6.570
KURTOSIS:                     85.902
*****************************************************************************************************************
        WE WILL NOW MAKE ANOTHER PASS THROUGH THE DATA.

        THE SAME TRANSFORMATIONS AND SELECTIONS AS LAST RUN WILL BE USED IN THIS RUN.




DATA TITLE  :   MT ARMOUR 1985 SOIL GEOCHEMISTRY
VARIABLE  :  AS
                                                            NUMBER OF    PERCENTAGE OF   CUMULATIVE    LOWER
                                                           SAMPLES IN     THE TOTAL     PERCENT BELOW  BOUND
                                                          THIS CATEGORY    SAMPLES       LOWER BOUND
 LOWER                 PERCENT OF THE TOTAL SAMPLES
 BOUND
INCLUDED |       10.0      20.0      30.0      40.0      50.0
         |---------+---------+---------+---------+---------+
   0.000 |                                                                           0.00     0.000
         |***************************************
         |***************************************                502          38.85
  10.000 |                                                                          38.85    10.000
         |*************************************
         |*************************************                  474          36.69
  20.000 |                                                                          75.54    20.000
         |****************
         |****************                                       202          15.63
  30.000 |                                                                          91.18    30.000
         |*****
         |*****                                                   65           5.03
  40.000 |                                                                          96.21    40.000
         |**
         |**                                                      24           1.86
  50.000 |                                                                          98.07    50.000
         |I
         |I                                                        9           0.70
  60.000 |                                                                          98.76    60.000
         |I
         |I                                                       11           0.85
  70.000 |                                                                          99.61    70.000
         |I
         |I                                                        3           0.23
  80.000 |                                                                          99.85    80.000
         |I
         |I                                                        1           0.08
  90.000 |                                                                          99.92    90.000
         |                                                         0           0.00
 100.000 |                                                                          99.92   100.000
         |                                                         0           0.00
 110.000 |                                                                          99.92   110.000
         |I
         |I                                                        1           0.08
         |---------+---------+---------+---------+---------+
         |       10.0      20.0      30.0      40.0      50.0
                       PERCENT OF THE TOTAL SAMPLES


VARIABLE:                    AS
NUMBER OF OBSERVATIONS:         1292
MINIMUM:                       1.000
MAXIMUM:                     111.000
MEAN:                         14.566
STANDARD ERROR OF MEAN:        0.331
STANDARD DEVIATION:           11.900
COEFFICIENT OF VARIATION:     81.700
SKEWNESS:                      2.009
KURTOSIS:                      7.204
```

$\bar{x} = 14.5$

96% < 40ppm

98% < 50ppm