XIII.—*Account of a Thermometrical Register kept at Dunfermline by the Rev. Henry Fergus, from 1799 till 1837, with the principal Results.* By JAMES D. FORBES, D.C.L., F.R.S., Sec. R.S. Ed., Professor of Natural Philosophy in the University of Edinburgh.

(Read 6th March 1860.)

1. When I found that the interesting meteorological register of Mr ADIE, which is well fitted to throw light upon the climate of Edinburgh, and of Scotland generally, was deficient of the important period of nearly sixteen years, from 1805 to 1820, I set on foot inquiries as to the existence of any other register of the thermometer which might approximately supply the defect. After some unsuccessful attempts, my attention was directed by Professor DOVE's useful temperature tables to a register of the thermometer kept by the Rev. Mr FERGUS of Dunfermline, of which the monthly means, from 1805 to 1824, are given in the "Edinburgh Philosophical Journal," vol. xiii. Though the distance of Dunfermline from Edinburgh is thirteen miles in a right line, and though it occupies the opposite slope of the valley of the Forth, not far from the Ochil Hills, yet a slight comparison of the observations showed a very remarkable coincidence in its climate with that of Edinburgh, not only as regards the mean annual temperature, but also in the distribution of temperature throughout the year. I therefore made an effort to obtain the original register from which the results published in the "Edinburgh Philosophical Journal" were derived; and through the kindness, in the first instance, of Mr DAVID LAING of the Signet Library, I was brought into communication with the Rev. JOHN FERGUS of Bower, near Wick, in Caithness, son of the Dunfermline observer, who most kindly placed in my hands his father's original register of the barometer, thermometer, and weather at Dunfermline, extending from 1799 to the time of his death in 1837, all made with one instrument, and at the same hour daily (9 A.M.), with very remarkable regularity.

2. During this long period of time but one thermometer was used, and it is still entire, and now in my possession.

3. From November 1802 until August 1837 the thermometer appears to have been constantly kept in the same exposure, which was rather a peculiar one, and which has been minutely described to me by the Rev. JOHN FERGUS. It was placed on the outside of an ordinary glazed window, in a staircase leading to an attic, with a north exposure. This window was above $3\frac{1}{2}$ feet wide, but, in order to avoid the window-tax, it was contracted externally by brickwork, so as to leave

in the centre of the lower part an unglazed opening 9 inches square, which admitted air freely to the interval between the brick wall and the window. The thermometer was suspended in this interval, into which the snow often drifted.

4. The effect of this peculiarity of exposure would probably be to modify the extremes both of heat and cold, but (especially for observations taken at 9 A.M.) it was not likely to affect materially the *mean* results.

5. The observations from May 1799 to November 1802, when the thermometer was moved into this position, seem (to judge by their results) to have been made probably *within* the house, and therefore I have not retained them in the following paper. Till August 1829 the observations were invariably made by Mr FERGUS, senior, when the failure of his eyesight devolved them (I believe) upon some member of his family; but they were still continued in all respects in the same manner until the commencement of September 1837, when the instrument was removed to a different situation in the town of Dunfermline, where it was rather exposed to reflected heat; and in 1842 it was transferred to a different part of the country. Two years later it was removed to Edinburgh, where I found it in April 1857, in the custody of Mrs FERGUS, widow of the original observer who had begun to use it nearly 60 years before. That lady confirmed the history of the observations, and the fact of its being one and the same instrument which was used from the first. She kindly placed it at my disposal for the purpose of comparison.* I found it to be a spirit of wine thermometer by KNIE, a very well known Edinburgh maker of the last century. The colour of the spirit was unimpaired (a circumstance very rare in modern thermometers), and the scale was of ivory clearly divided. Unfortunately the tube was fixed to the scale with thread in an insecure manner, so as to leave some uncertainty as to the precise reading. On a comparison with a standard thermometer, *corrections to the scale readings* of KNIE's thermometer were obtained within the limits of the monthly temperatures, and, by the aid of an interpolating curve, the following *approximate* corrections ascertained, which were then applied to the monthly averages calculated anew from Mr FERGUS' MS. volume:—

Corrections to Scale Readings of the Dunfermline Thermometer.

At temp. 32°	— 0·5	At temp. 50°	+ 0·6
40	— 0·3	55	+ 0·9
45	+ 0·1	60	+ 0·9

* This lady died at an advanced age in the interval between the writing of this paper and its being read.

6. The monthly average temperatures to 1830 are contained in the following Table:—

TABLE XVI.—DUNFERMLINE OBSERVATIONS CORRECTED FOR INDEX ERROR.

A.D.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1803	35.4	35.8	39.6	45.3	48.9	54.3	63.5	58.0	52.7	47.6	38.0	35.7
1804	38.0	34.9	37.8	41.4	54.1	59.3	60.8	57.8	55.8	48.4	40.2	34.3
1805	35.7	35.6	41.3	45.8	48.7	55.5	61.1	59.4	56.2	46.0	43.4	36.2
1806	35.1	37.2	39.8	44.9	52.9	58.7	59.3	59.1	54.7	50.3	44.5	39.8
1807	37.3	36.1	34.8	43.5	49.8	55.7	62.4	59.7	47.7	48.8	33.5	36.5
1808	35.9	35.5	39.0	41.1	53.6	58.8	63.3	59.8	53.5	43.1	39.6	35.9
1809	31.2	38.3	41.7	39.9	53.4	55.5	58.3	57.0	53.6	52.3	40.6	36.7
1810	37.3	35.4	35.9	44.0	46.1	58.0	57.4	58.5	54.8	49.5	39.1	35.6
1811	34.2	36.9	42.1	44.4	51.1	55.0	58.8	55.9	53.4	50.7	42.7	36.0
1812	35.6	39.0	35.1	39.1	48.9	55.2	56.1	56.1	53.4	46.9	39.2	35.1
1813	36.0	39.5	42.6	42.7	48.0	56.5	58.6	57.1	53.3	44.1	38.3	37.5
1814	27.7	35.1	37.5	47.6	48.3	53.3	59.0	57.0	54.1	45.0	38.6	35.5
1815	33.5	40.6	41.3	45.0	50.8	55.9	58.2	57.2	53.0	47.6	36.7	33.9
1816	35.3	34.6	36.2	39.6	49.2	54.2	55.3	54.6	50.7	46.1	38.0	35.2
1817	38.2	39.0	37.8	43.6	45.1	54.9	56.8	54.2	53.3	41.6	44.1	35.2
1818	37.0	35.8	36.2	39.3	49.7	59.9	60.2	56.3	52.4	52.4	47.1	39.7
1819	37.8	35.9	40.4	44.0	49.1	54.8	58.5	61.9	53.0	45.6	36.8	33.8
1820	31.7	39.5	38.9	45.9	50.0	54.8	57.9	56.0	51.2	43.6	41.9	38.6
1821	37.2	39.3	39.5	44.8	46.7	53.5	57.2	57.5	53.9	48.4	42.3	39.6
1822	39.3	40.0	41.3	46.0	51.8	59.7	58.6	57.1	50.6	47.5	44.2	37.2
1823	33.5	33.7	38.6	42.6	51.0	54.0	56.3	55.2	52.2	45.2	45.5	37.2
1824	39.7	38.8	38.2	44.8	50.2	55.7	58.9	56.5	53.3	45.4	39.7	37.6
1825	38.2	39.0	40.1	44.6	49.2	56.6	60.9	59.2	56.3	48.8	37.3	38.4
1826	34.0	41.4	39.9	45.3	51.9	62.6	63.0	59.6	53.6	49.1	38.5	40.4
1827	34.9	33.1	37.7	44.2	50.2	56.8	59.7	56.3	55.3	50.3	42.1	42.3
1828	39.1	39.3	41.4	43.8	51.4	58.0	58.7	58.0	54.5	47.9	44.4	43.5
1829	33.0	37.3	38.0	40.7	51.4	57.9	58.0	54.6	49.9	46.6	39.5	37.1
1830	34.8	35.5	42.8	45.9	51.6	54.1	59.1	55.2	52.2	49.2	43.0	35.1
Means,	35.59	37.22	39.12	43.56	50.12	56.40	59.14	57.31	53.16	47.43	40.67	37.13
Mean Temperature of the year, 46°40.												

I do not consider these results to be of a high scientific character, but yet to be so carefully and continuously made as to be well worthy of preservation. I think, also, that the history I have given of the recovery of every particular respecting the observer and the observations, through the testimony of an eye-witness, together with the recovery of the original register and of the original instrument, is a circumstance worthy of note, as an encouragement to trace such data to the best procurable authority.

7. In order to render the observations fit for the purpose for which I had

sought them out—namely, to supplement the deficient years of Mr ADIE's series, I availed myself of the ten years 1821–30, which were common to both series, and by finding the differences of the *uncorrected* Dunfermline temperatures from those of Edinburgh, I used them to deduce for Edinburgh the temperatures of the years 1805–20. This I have more fully explained in my paper on the Climate of Edinburgh.