AUSTRIAN METEOROLOGY.—In the year-book for 1920 of the Zentralanstalt für Meteorologie und Geodynamik in Vienna, Dr. F. M. Exner directs attention to the number and distribution of meteorological observatories in Austria. There are now 86 observatories, of which 16 are of the first class. The year-book gives the full daily observations at Feldkirch, Salzburg, Sonnblick, Vienna, Graz and Obir, and the monthly and year means for all stations. Further tables give additional data for Vienna from self-registering instruments, while the final section gives the records of air movements derived from pilot balloons at Vienna in 1919 and 1920, to which are added some data from the Hochobir observatory in Carinthia at an elevation of 6700 feet.

FREQUENCY OF HEAVY RAIN IN INDIA.—Memoirs of the Indian Meteorological Department, vol. xxiii. pt. 8, gives much valuable data by Sir Gilbert T. Walker, who was until recently Director-General of Observatories. The object of the discussion is to supply engineering and other projects dependent upon rainfall with trustworthy information regarding both the frequency of heavy rain over various districts of India and the maximum amount of rain to be expected within definite short periods. The observations are for all rain-gauge stations maintained during the period of 30 years from 1891 to 1920, using data only where records are available for at least 10 years, and the number of years is stated. The falls are given for 24 hours, ending at 8 A.M., for the amounts of 3 to 4 inches, 4 to 5, and for each inch to 15 inches, while information of falls exceeding 15 inches in 24 hours is given as footnotes to the ordinary tables. To test the accuracy of the 30 years' limit, frequency tables have been compiled for 8 stations using all available data; the Madras observations cover a period of 85 years and Bombay 76, both of which show the 30 years' results to be quite satisfactory. The tables are grouped for the several divisions. At Cherrapunji, where there are two rainfall stations, the records extend over 30 years; these show a fall of 39 to 40 inches in the 24 hours, and 5 other falls between 30 and 35 inches, while there are in addition 25 falls between 20 and 30 inches in the 24 hours. There are more than ten other stations with a rainfall of upwards of 20 inches in the 24 hours. Rainfall frequencies at five stations in the south of the Bombay Presidency are given in an appendix; these are said to bear out Blanford's statement "that the greatest quantity of rain is yielded by falls not differing very much from those of average measurement." Reference is made to Part 7 of the same volume, which gives the monthly and annual rainfall amounts for all Indian stations to the end of 1920. (See NATURE, June 7, 1924, p. 836.)

MEASUREMENT OF RADIO FREQUENCY.—A paper (No. 489) of more than ordinary interest on the measurement of radio frequency by Grace Hazen and Frieda Kenyon has been published by the Bureau of Standards at Washington. A direct comparison is made between the accurately known frequency of a tuning fork and a high radio frequency. Two intermediate radio frequency generating sets are employed and the adjustments are made by noticing the Lissajous figures produced in a cathode ray oscillograph. The tuning fork had a frequency of 1024·2 periods per second and was driven by a five-watt electron tube generating set. The intermediate generating sets each used a 250-watt electron tube. The oscillograph had a tube of the cold cathode type and required about 20,000 volts to operate it. The Lissajous figures were formed on the fluorescent screen by applying the two alternating magnetic fields at right angles to one another. The procedure adopted was to adjust the frequency of the first intermediate set to be a known multiple of the audio frequency. A range from 1·5 to 22 times the audio frequency was thus obtained. The second intermediate set was then adjusted to the first intermediate set in a similar way. Finally a point on the scale of the high frequency meter was found. The range of the wave meter standardised in this way extends from 3·5 to 5000 kilocycles per second. Photographs of the figures obtained and the apparatus used are given in the paper. The method seems to have been first used by L. M. Hull in 1919. The limitations of the accuracy attainable appear to be entirely in the audio frequency source used as the basis of the measurement and in calibrating and reading the wave meter.

THE ELECTRICAL CHARGE OF THE EARTH.—In a paper in the *Annalen der Physik* for October, Dr. C. Ramsauer directs attention to the fact that, though the surface density σ can be deduced from the potential gradient in the atmosphere by means of the formula $2\pi\sigma = -dV/dh$, a direct measurement requires a definite reference point, which can now be supplied by the state of an electrically neutral atom, containing an equal number of electrons and of protons. This is the state in the interior of every conductor, independently of the distribution of electricity on its surface; and an experiment is described in which an insulated plate A, parallel to and in the plane of the earth's surface, can be covered with a conducting cover B connected to the earth, so that A, which was originally part of the earth's surface, is now in the interior of the earth. A is connected to earth through a circuit containing a galvanometer and a key. The key is pressed down with B removed, the key is raised, B is placed over A, the key is pressed down and the charge on A discharged through the galvanometer. Another current can be produced when the cover is removed and A becomes charged again. It is possible to use an electrometer instead of a galvanometer, if the capacity of the condenser A – B is known. In this way, the excess of electrons for a definite area of the earth's surface is determined; the highest value observed was about 1×10^{10} electrons or 15×10^{-10} coulombs per square metre; on one occasion, during a light shower, the density fell from 14×10^{-10} coulombs per sq. m. to zero in a few minutes. Such variations are due to space charges in the atmosphere, and possibly to the charges of the heavenly bodies.

ZIRCONIUM AND HAFNIUM OXIDES.—G. Hevesy and V. Berglund have determined the densities of zirconium and hafnium oxides by the pyknometer method (J. Chem. Soc., November). X-ray examination showed that the latter oxide contained less than 0·5 per cent. of the former; both oxides were prepared from the normal sulphate and were carefully purified. The average densities obtained were (20°): ZrO_2 5·73, HfO_2 9·67; hence the percentage of hafnium oxide in a mixture of the two oxides is given by the formula $(d - 5{\cdot}73)/0{\cdot}0394$, where d is the density of the oxide mixture at 20°. This formula should only be used when both oxides are prepared by exactly the same method.

ERRATUM.—In a note on Mr. J. B. Kramer's paper entitled "An Electronic Battery," in the issue of December 13, p. 873, it was stated that the terminal connected to the carbon is negative; this is incorrect —the terminal connected to the zinc is negative, and that connected to the carbon positive.