electrical data certain conclusions have been drawn which are no doubt of considerable importance for the chemistry of steel and iron.

MESSRS. LONGMANS, GREEN AND CO. have just published new editions of two well-known works of science—Ganot's "Physics" and Schäfer's "Essentials of Histology." Dr. Atkinson's translation of Ganot's "Éléments de Physique" has long been accepted as a standard description of the groundwork of physical science, and the sixteenth edition, edited by Prof. A. W. Reinold, F.R.S., will increase the high reputation the book has gained. Though physical science, even in its most elementary stages, needs to be studied practically to be of any value, the results obtained in the laboratory can only be fully understood by considering them in relation to the investigations of makers of scientific history. The best instruction in physics is that which combines a course of practical work with such exact and philosophical descriptions as are found in Ganot's book. Practice without knowledge of theory is as bad as theory without practice. Prof. Reinold has added new matter, as well as revised the book, with the result that a comprehensive view is given of fundamental physical principles and relationships as now understood, suitable for elementary students of the science. The sections on magnetism and electricity have been greatly altered, and accounts of apparatus and machines which have ceased to be of interest have been omitted. Prof. E. A. Schäfer's "Essentials of Histology, Descriptive and Practical, for the Use of Students" has reached its sixth edition. The work has been greatly enlarged, the chief additions being in the text relating to the structure of the central nervous system. Many new illustrations have also been added. The volume is both an elementary text-book of histology and a practical manual giving students precise directions for the microscopical examination of the tissues.

THE additions to the Zoological Society's Gardens during the past week include two Cape Zorillas (*Ictonyx zorilla*) from South Africa, presented by Capt. W. B. White; a Red-footed Ground Squirrel (*Xerus erythropus*) from West Africa, presented by Mr. P. G. Knight; a Ruddy Finch (*Carpodacus erythrinus*) from Siberia, presented by Mrs. G. A. Way; two Mountain Ka-Kas (*Nestor notabilis*) from New Zealand, presented by Dr. W. H. Hornibrook; two European Pond Tortoises (*Emys orbicularis*), European, presented by Mr. E. C. Brown; two and three Moloch Lizards (*Moloch horridus*) from Australia, presented respectively by Mr. F. Richards and Mr. W. Nichols; a Common Viper (*Vipera berus*), British, presented by Mr. E. Ball; two Striated Babblers (*Aryga earlii*), a Roofed Terrapin (*Kachuga tectum*) from India, two Blyth's Nicobar Parrakeets (*Palaeornis caniceps*) from the Nicobar Islands, two Black Iguanas (*Metopoceros cornutus*) from the West Indies, a Royal Python (*Python regius*) from West Africa, a Corn Snake (*Coluber guttatus*) from North America, deposited; a Banksian Cockatoo (*Calyptorhynchus banksii*) from New South Wales, purchased; a Thar (*Hemitragus jemlaica*) born in the Gardens.

THE ROYAL OBSERVATORY VISITATION.

ON Saturday last the Board of Visitors made their annual visit to Greenwich, and the Astronomer Royal submitted his report for the past twelve months.

It cannot be said, however, that the weather was all that could be desired for such an occasion and for this time of the year.

The following is a brief *résumé* of the report:—

Transit-Circle.

With this instrument the usual observations have been made, the undermentioned table giving the details of the number involved.

Transits, the separate limbs being counted as one observation	11,133
Determinations of collimation error	303
Determinations of level error	663
Circle observations	9,666
Determinations of nadir point (included in the number of circle observations)	681
Reflection observations of stars (similarly included)	505

The number of stars observed in 1901 was 4,327.

Good progress seems to have been made in the observations of the reference stars for the astrographic plates, for which 10,000 stars are to be observed three times above and twice below pole—with the exception of about 1000 stars fainter than the ninth magnitude which cannot be observed below pole. A table giving the details of the progress up to date shows that for each of the five degrees of N.P.D. reckoning from the pole, 100, 90, 46, 46, and 45 per cent. respectively of the necessary observations have been secured.

The change in the method of adopting the azimuth error introduced at the beginning of 1900 has effected a satisfactory diminution of the small discordance in right ascensions taken on opposite sides of the pole.

The colatitude of the transit-circle as found from observations of about 581 stars in 1901 is 38° 31′ 21″·76, differing by −0″·14 from the adopted value. The values of this correction since 1897 are—

1897 ...	−0″·17	1900 ...	−0″·10
1898 ...	−0·15	1901 ...	−0·14
1899 ...	−0·14		

Very satisfactory progress has been made with the re-reduction of Groombridge's observations, the three years 1809, 1810 and 1811 with 10,500 observations of R.A. and N.P.D. having been finished since the last report. A catalogue of the positions of the stars in the *Berliner Jahrbuch* derived from Groombridge's observations from 1806–1810 was forwarded to Dr. Auwers for use in the preparation of his fundamental catalogue, and he found that a large increase in accuracy had been effected by the re-reduction.

The Altazimuth.

Through the frequent breaking of the spider lines in this instrument, the micrometer slides have been altered to reduce the span, and the result has been very satisfactory. The instrument has been used in the meridian in four positions as a reversible transit-circle for observations of sun, moon, planets, and fundamental stars, and also for observation of the Eros reference stars, and reference stars for Sir David Gill's heliometer observations of major planets. The total number of observations made was 6556.

Further determinations of the division errors have been completed, and these have been combined with the previous results and definitive corrections for division error deduced.

The Reflex Zenith Tube.

This instrument was, as is well known, originally designed by Sir G. B. Airy for the purpose of determining the constant of aberration by observations of γ Draconis, which passes very near the zenith of Greenwich, but after many years of observations it was found that the results for parallax of γ Draconis and aberration were anomalous, and an attempt was made in the years 1882 to 1886 by a long series of transits over the wires to refer these discordances to temperature effects, but without success. The observations of zenith distance of γ Draconis were, however, continued up to 1899, when they were dropped owing to the pressure of observations for the new Ten Year Catalogue. This instrument has, however, become of great importance, for Mr. Chandler has recently shown that the apparently anomalous results previously obtained are explained by the variation of latitude, and that this instrument is specially adapted to the determination of the amount of this variation.

It has therefore in consequence been decided to resume the observations of γ Draconis without delay, and to observe such other stars as passed near enough to the zenith and were sufficiently bright. By suitable modifications it has been found possible to increase the utility of the instrument, by which several other stars down to the seventh magnitude can be observed.

The 28-inch Refractor.

This instrument has been used throughout the year for micrometric measurements of double stars. The total number of double stars measured in the year is 382; of these 221 have components less than 1″·0 apart, and 120 less than 0″·5. The close pairs whose distance apart is less than 1″·0 have been measured on the average on three nights each, and the wider pairs on an average of two nights. The wider pairs consist of bright stars with a faint companion, of third companions to close pairs, and of stars of special interest.

In addition to the list of most difficult and interesting stars measured, it is stated that good series of measures have been obtained of κ Pegasi, δ Equulei, 70 Ophiuchi, and ζ Herculis. Capella also has been examined at every favourable opportunity.

Thompson Equatorial.

This instrument has been used chiefly for photographing Neptune and his satellite, and 52 measurable photographs were secured. With the 30-inch reflector long exposed photographs of Nova Persei were obtained, but unfortunately, owing to the object-glass of the guiding telescope not being quite firm in its cell, displacements during exposure occurred.

Astrographic Equatorial.

The photography for the Greenwich zone (Dec. + 64° to the Pole) having been practically completed, the work during the past year was directed to replacing such plates as were found to be inferior to the general standard. Four hundred and thirteen plates were taken, but of these fifty-seven were for various reasons rejected.

The report contains many details about the measurement of the plates, the counting of the number of stars, and various other preparations which would occupy too much space, but the following table may be given, as a good idea of the magnitude of the new work can be at once gathered:—

Limits of Declination.	Number of Stars Measured.	Number	Number in A.G.C.	A.G.C.
64°–65°	8,954	1,900	1,200	Helsingfors
65°–70°	49,210	7,782	3,700	Christiania
70°–75°	50,190	5,870	—	Dorpat
75°–77°	18,100	1,856	1,700	Kazan
77°–78° (oh. to 16h.)	5,430	613	420	,,

Spectroscopic and Heliographic Observations.

For the year 1901, Greenwich photographs have been selected for measurement on 149 days, and photographs from India and Mauritius (filling up gaps in the series) on 210 days, making a total of 359 days out of 365 on which photographs are at present available.

The proportion of days upon which the sun was entirely free from spots was 80 per cent. for the year 1901, and about the same proportion for 1902 to the date of this report. But the appearance of two considerable groups this year, and the high latitudes of the spots generally, are indications that the actual minimum is passed.

Magnetic Observations.

The variations of magnetic declination, horizontal force and vertical force, and of earth currents, have been registered photographically, and accompanying eye observations of absolute declination, horizontal force, and dip have been made as in former years. The regular determinations of magnetic declination, horizontal force, and dip have been made with the new declinometer, the Gibson deflection instrument, and the Airy dip circle mounted in the Magnetic Pavilion.

The principal results for the magnetic elements for 1901 are as follow:—

Mean declination ... ... 16° 26′·0 West.

Mean horizontal force ... 4·0082 (in British units). 1·8481 (in metric units).

Mean dip (with 3-inch needles) ... 67° 6′ 5″.

These results depend on observations made in the new Magnetic Pavilion, and are free from any disturbing effect of iron.

The magnetic disturbances in 1901 have been small and few in number. There were no days of great magnetic disturbance and 8 of lesser disturbance.

Meteorological Observations.

The registration of atmospheric pressure, temperature of the air, and of evaporation, pressure and velocity of the wind, rainfall, sunshine and atmospheric electricity has been continuously maintained.

The mean temperature for the year 1901 was 49°·3, being 0°·2 below the average for the fifty years 1841–90.

During the twelve months ending 1902 April 30, the highest temperature in the shade (recorded on the open stand in the Magnetic Pavilion enclosure) was 87°·9 on July 19. The highest temperature recorded in the Stevenson screen in the enclosure was 86°·0, and in that in the Observatory grounds 87°·1 on the same day.

The lowest temperature of the air recorded in the year was 14°·3, on February 16. During the winter there were 52 days on which the temperature fell below 32°, a number slightly below the average.

The low temperature in February is the lowest temperature recorded in that month since 1895, when, on February 8, the minimum February temperature 6°·9 occurred.

The number of hours of bright sunshine recorded during the twelve months ending 1902 April 30, by the Campbell-Stokes instrument, was 1519 out of 4457 hours during which the sun was above the horizon, so that the mean proportion of sunshine for the year was 0·341, constant sunshine being represented by 1.

The rainfall for the year ending 1902 April 30 was 17·89 inches, being 6·65 inches less than the average of fifty years. The number of rainy days was 116. The rainfall has been less than the average in each year since 1894. The total deficiency of rainfall for the seven years ending 1901 December 31 amounts to 23·70 inches.

The remaining portion of the report deals with the printing and distribution of the Greenwich publications, the examination of chronometers, time-signals, &c.

A short reference is made to the re-determination of the Greenwich-Paris longitude, and to the expedition which went out to Sumatra and Mauritius to observe the total solar eclipse of May 18, 1901.

EVIDENCE OF A "SEICHE" ON A SCOTTISH LOCH.

WHILE engaged in the survey of Loch Trieg, Inverness-shire, on May 22, Dr. T. N. Johnston and Mr. J. Parsons, of the British Lakes Survey, observed what appears to be an undoubted *seiche*, *i.e.* a periodic variation in the level of a lake, considered by Prof. Forel, among others, to be due to sudden changes in barometric pressure, whilst others, again, consider them due to earth-movements.

The attention of Dr. Johnston was first drawn to the phenomenon by observing that certain small stones near the shore were covered and uncovered at regular intervals, the surface of the loch being perfectly calm at the time, and had been so during the day.

At a quarter to 9 p.m., a foot rule was placed vertically in the water and the surface level observed at intervals of one minute for forty minutes.

The results obtained confirmed the rougher observation that the surface of the water was undergoing slow oscillations.

The amplitude of the wave proved to be $\frac{9}{16}$ inch, and the period, *i.e.* the time taken in rising from the lowest to the highest level and falling again, averaged 9·5 minutes.

Despite the smallness of the amplitude compared to that noticed on the Lake of Geneva and other lakes, the observers had no doubt that the movements were not due to surface ripples.

Loch Trieg is about six miles long and three-quarters of a mile wide, its longer axis lying nearly north and south. The survey of the loch is now completed, and a depth of 436 feet has been found within two miles of the southern extremity.

Should this variation of level prove to be a true *seiche* it will