SCIENTIFIC SERIALS

Poggendorff's Annalen der Physik und Chemie, No. 10.—This number contains several papers of great interest: the first is by G. Quincke, on electric currents resulting from the non-simultaneous insertion of two mercury-electrodes into different liquids. The author bases his experiments upon those of St. Claire Deville and Troost, who found it probable that platinum absorbs hydrogen or other gases when being heated in a gas or alcohol flame, and then shows a different electric action towards water and dilute acids from that of platinum that has not been so heated. The paper contains a minute description of the apparatus used and tables of the results obtained; in an appendix the author treats of the relation between capillary and electrical phenomena, referring to G. Lippmann's paper (*Pogg. Ann.*, vol. 149, p. 556), from whom he materially differs.—Experiments made with a magnetised copper wire, by Prof. Balfour Stewart and Dr. A. Schuster.—On the chemical action of the solar spectrum upon haloid salts of silver, by H. W. Vogel. Chloride, bromide, and iodide of silver, are not only sensitive towards the highly refrangible rays of the spectrum, but also towards the less refrangible ones, although in a much smaller degree; their sensitiveness does not only depend upon their optical power of absorption of the respective rays, but also upon the absorption power of other substances they may be mixed with. Coloured substances which assist the photographic reduction process and absorb certain spectral rays, highly increase the sensitiveness of the silver salt towards the absorbed rays; thus the sensitiveness of silver salts for red, yellow, and green rays can be greatly augmented. Certain colourless bodies are found to have a similar action. The light reflected from pigments shows a very different effect from that of spectral colours, on account of the varying optical composition of artificial colours and their smaller intensity.—On the question of velocity of magnetic action at distances, by H. Herwig; investigations relating principally to terrestrial magnetism. It is found that this velocity is at least half a million geographical miles (or about 2½ millions of English miles) per second; in other words, that at any given spot on the surface of the earth terrestrial magnetism becomes fully active in less than the 300th part of a second.—On a modification of the magneto-electric revolution experiment, by the same.—On comparison of electric machines, by Mr. Mascart. The author describes experiments made to ascertain the actual quantity of electricity produced by eleven different machines in a given time and under the same conditions.—On the measuring of the electromotive power of voltaic piles in absolute units, by A. Crova.—The frequency of changes of colour in the scintillation of stars is generally related to the spectrum they show, by C. Montigny. Stars that twinkle strongly show few spectral lines, while those with little scintillation have many bands and lines in their spectra.—On the theory of organ-pipes, by H. Schneebeli.—Is the application of the *vis viva* justified in the mechanical theory of heat? by H. Fritsch. The author answers this question in the negative.—On induction-effects in magnets of different hardness, by L. Külp.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, Jan. 7.—"Remarks on a New Map of the Solar Spectrum," by J. Norman Lockyer, F.R.S.

I beg permission to lay before the Royal Society a portion of the new map of the solar spectrum, referred to in one of my former communications.

It consists of the portion between w. l. 39 and 41.

I have found it necessary, in order to include all the lines visible in my photographs in such a manner that coincidences may be clearly shown, to construct it on four times the scale of Angström's "Spectre-Normal."

The spectra of the following elements have been photographed side by side with the solar spectrum, and the coincidences shown:—

Fe, Co, Ni, Mn, Ce, U, Cr, Ba, Sr, Ca, K, Al.

The wave-lengths of new lines in the portion of this spectrum at present completed have been obtained from curves of graphical interpolation. Instead of the reading of a micrometer-scale, a photographic print of the spectrum has been employed in the construction of these curves, the wave-lengths of the principal lines being taken from an unpublished map of the ultra-violet region of the solar spectrum, a copy of which has been kindly placed at my disposal by M. Cornu. The photograph of the solar spectrum, from the ultra-violet to beyond F, kindly given to me by Mr. Rutherford, has also proved of great service in the present work. I have, in fact, up to the present time, only been able to excel this photograph in the region about H.

From the extreme difficulty of carrying on eye-observations upon the portion of the spectrum now completed, Angström's map is, of course, very incomplete about this region. The few lines mapped differ slightly in some cases from the positions assigned by Cornu; but the wave-lengths given by the latter observer generally fall into the curve without breaking its symmetry, and these positions have therefore been adopted. The advantage possessed by the photographic method over eye-observation may be estimated from the following numerical comparisons:—

Region of spectrum, 3900–4100.

Number of lines in Angström's "Spectre-Normal"		39
,, ,,	Angström's and Thalén's map of the violet part of the solar spectrum ...	185
,, ,,	Cornu's map	205
,, ,,	New Map	518

It will serve further to illustrate the advantages of the photographic method, to compare the number of lines in the spectra of metals already observed with the number of lines of the same metal given by Angström in the "Spectre-Normal."

Region of spectrum, 3900–4100.

Metal.	Lines in new map.	Lines in Thalén's map.
Fe	71	19
Mn	53	12
Co	47	—
Ni	17	—
Ce	163	—
U	18	—
Cr	24	—
Ba	7	—
Sr	5	—
Ca	7	6
K	2	—
Al	2	2
Total ...	416	Total ... 39

The purification of the various metallic spectra has at present been only partially effected; but I have seen enough already to convince me of the extreme rigour with which the principle I have already announced may be applied, while at the same time there are evidences that the application of it may lead to some results not anticipated in the first instance.

My object in laying these maps before the Society, and presenting this *ad interim* report of progress, is to appeal to some other man of science, if not in England, then in some other country, to come forward to aid in the work, which it is improbable that I, with my small observational means and limited time, can carry to a termination. I reckon that, having regard to routine solar work, it will require another year before the portion from H to G is completely finished, even for the metals the spectra of which are shown in the maps now exhibited. When this is done there will still remain outstanding all the ultra-violet portion, the portion from G to F, both capable of being photographed by short exposure, and the whole of the less refrangible part, which Draper and Rutherford have both shown can be reached by long exposure with the present processes.

I cannot but think, moreover, that when the light which the spectroscope has already thrown upon molecular action shall be better known, and used as a basis for further inquiry, methods of photography greatly exceeding the present one in rapidity, in the less refrangible portion of the spectrum, will be developed and utilised in the research.

The map is being drawn by my assistant, Mr. Raphael Meldola (to whom my thanks are due for the skill and patience he has brought to bear upon the work), in the first instance with more especial reference to the positions, thicknesses, and individualities of the lines; the final revision will consist of an absolute intensity reproduction of the photographs.

"On the Spectrum of Coggia's Comet," by Willam Huggins, D.C.L., LL.D., F.R.S.

From his observations of five small comets in the years 1866, 1868, and 1871, the author had shown that a great part of the light of those comets was emitted by the cometary matter; and further, that carbon, in some form, was probably present in them.