It was found that the second form of experiment gave the most uniform results; the method by cooling being less accurate, owing to currents of air in the room, &c.

The results are embodied in the following Table:—

(Rate of Heating from 25° to 50°)

TABLE I.

Pressure.	Temperature.	Seconds occupied in rising each 5°.	Total number of seconds occupied.
760 millims.	25°	0	0
	25 to 30	15	15
	30 to 35	18	33
	35 to 40	22	55
	40 to 45	27	82
	45 to 50	39	121
1 millim.	25°	0	0
	25 to 30	20	20
	30 to 35	23	43
	35 to 40	25	68
	40 to 45	34	102
	45 to 50	48	150
620 M.[1]	25°	0	0
	25 to 30	20	20
	30 to 35	23	43
	35 to 40	29	72
	40 to 45	37	109
	45 to 50	53	162
117 M.	25°	0	0
	25 to 30	23	23
	30 to 35	23	46
	35 to 40	32	78
	40 to 45	44	122
	45 to 50	61	183
59 M.	25°	0	0
	25 to 30	25	25
	30 to 35	30	55
	35 to 40	36	91
	40 to 45	45	136
	45 to 50	67	203
23 M.	25°	0	0
	25 to 30	28	28
	30 to 35	33	61
	35 to 40	41	102
	40 to 45	55	157
	45 to 50	70	227
12 M.	25°	0	0
	25 to 30	30	30
	30 to 35	37	67
	35 to 40	41	108
	40 to 45	58	166
	45 to 50	86	252
5 M.	25°	0	0
	25 to 30	38	38
	30 to 35	43	81
	35 to 40	54	135
	40 to 45	71	206
	45 to 50	116	322
2 M.	25°	0	0
	25 to 30	41	41
	30 to 35	51	92
	35 to 40	65	157
	40 to 45	90	247
	45 to 50	165	412

There are two ways in which heat can get from the glass globe to the thermometer—(1) By radiation across the intervening space; (2) by communicating an increase of motion to the molecules of the gas, which carry it to the thermometer. It is quite conceivable that a considerable part, especially in the case of heat of low refrangibility, may be transferred by "carriage," as I will call it to distinguish it from convection which is different, and yet that we should not perceive much diminution of transference, and consequently much diminution of rate of rise with increased exhaustion, so long as we work with ordinary exhaustions up to 1 millim. or so. For if, on the one hand, there are fewer molecules impinging on the warm body (which is adverse to the carriage of heat), yet on the other the mean length of path between collisions is increased, so that the augmented motion is carried further. The number of steps by which the temperature passes from the warmer to the cooler body is diminished, and accordingly the value of each step is increased. Hence the increase in the difference of velocity before and after impact may make up for the diminution in the number of molecules impinging. It is therefore conceivable that it may not be till such high exhaustions are reached that the mean length of path between collisions becomes comparable with the diameter of the case, that further exhaustion produces a notable fall in the rate at which heat is conveyed from the case to the thermometer.

The above experiments show that there *is* a notable fall, a reduction of pressure from 5 M. to 2 M. producing twice as much fall in the rate as is obtained by the whole exhaustion from 760 millims. to 1 millim. We may legitimately infer that each additional diminution of a millionth would produce a still greater retardation of cooling, so that in such vacua as exist in planetary space the loss of heat—which in that case would only take place by radiation—would be exceedingly slow.

[1] M = millionth of an atmosphere.

SCIENTIFIC SERIALS

Journal de Physique, December, 1880.—Note on magic mirrors, by M. Bertin.—On some applications of articulated systems, by M. Robin.—Experiments on the discharge in rarefied gases, by M. Righi.—Notice on the life and works of M. Almeida.

Archives des Sciences Physiques et Naturelles, November 15.—Meteorological *résumé* of the year 1879 for Geneva and the Great St. Bernard, by M. Plantamour.—Disinfection of vehicles, plants, collections of natural history, and various objects with anhydrous sulphurous acid, by Dr. Fatio.—Observations on a memoir of M. Schönn, by M. Soret.—On the phenomenon of hydration in peptonisation of albuminoid substances, by Dr. Danilewsky.—Notes on the winds of mountains, by M. Pittier.—Case of diplopia, by Prof. Wartmann, &c.

Reale Istituto Lombardo di Scienze e Lettere. Rendiconti. vol. xiii. fasc. xviii., November, 1880.—This number contains lists of prizes awarded and offered.

Atti della R. Accademia dei Lincei, vol. v. fasc. 1 (December 5, 1880).—New studies on the nature of malaria, by SS. Cuboni and Marchiafava.—Graphic determination of the elastic force relative to plane elements passing through a point, by S. Modigliano.—On the geological nature of strata met with in the tubular foundations of the new iron bridge built on the Tiber at Ripatta, and on the *Unio sinuatus*, Lamk., there found, by S. Meli.—On the structure of the envelope of the ova of some fishes, by S. Lepori.—On the preservation of man in countries of malaria, by S. Tommasi-Crudeli.—On bilinear ternary forms, by S. Battaglini.—On the projected stations for systematic physical observations in polar regions, by S. Cora.—On a cebocephalic caprine monster, by S. de Sanctis.—On the recent restoration of the scholastic and tomistic philosophy, by S. Ferri.

SOCIETIES AND ACADEMIES

LONDON

Photographic Society, December 14, 1880.—J. Glaisher, F.R.S., president, in the chair.—Papers were read by Prof. T. E. Thorpe, F.R.S., on a simple and expeditious method of preparing pyrogallol for dry plate development. The method proposed is to put dry gallic acid and glycerine into a flask, which is then heated to 200° on a sand tray, as long as bubbles of carbon dioxide are seen to be formed in the liquid. The gallic acid soon dissolves and is entirely converted into the theoretical quantity of pyrogallol, viz., 80 per cent.—By Capt. Abney, R.E., F.R.S., iodide and ammonia in gelatine emulsions. It was stated that iodides in gelatine bromide emulsion kept the silver salts from being deposited upon the shadows, as also that there is freedom from decomposition of the film, and tendency to red fog, and more light can be used in preparing and developing the plates.—And also by Capt. Abney on a photographic sunshine recorder. This consisted of a semi-cylindrical box with a flat lid, in the centre of which is a small hole; round the inside of the cylinder strips of sensitive paper are