that all forms of physical energy, whether visible motion, heat, light, magnetism, electricity, chemical action, or other forms not yet understood, are mutually convertible; that the total amount of physical energy in the universe is unchangeable, and varies merely its condition and locality, by conversion from one form to another, or by transference from one portion of matter to another. Prof. W. Thomson has pointed out, that in the present condition of the known world there is a preponderating tendency to the conversion of all other forms of energy into heat, and to the equable diffusion of all heat; a tendency which seems to lead towards the cessation of all phenomena, except stellar motions. The author of the present paper points out that all heat tends ultimately to assume the radiant form; and that, if the medium which surrounds the stars and transmits radiation between them be supposed to have bounds encircling the visible world, beyond which is empty space, then at these bounds the radiant heat will be totally reflected, and will ultimately be re-concentrated into foci; at one of which if an extinct star arrives, it will be resolved into its elements, and a store of energy re-produced.

7th. 'On the Causes of the Excess of the Mean Temperature of Rivers above that of the Atmosphere, recently observed by M. Renou,' by W. J. M. Rankine.—M. Renou having for four years observed the temperature of the River Loire, at Vendome, as compared with that of the atmosphere, has found, that the mean temperature of the river invariably exceeds that of the air, by an amount varying from 1¼ to 3 centigrade degrees, and averaging 2°.24 centigrade, and a similar result has been deduced from observations made by M. Oscar Valin on the Loire at Tours. M. Renou and M. Babinet account for this fact by the reradiation of the bed of the river of solar heat previously absorbed by it. Mr. Rankine thinks this supposition inadequate to account for the facts; because the excess of temperature of the river over the air was considerably above its mean amount in November, and very near its maximum in December; and because the mean diurnal variation of temperature of the river was much less than that of the air. He considers that friction is more probably the principal cause of this elevation of temperature; for if water descends in an uniform channel, with an uniform velocity, from a higher level to a lower, the whole power due to its descent is expended in overcoming friction; that is to say, is converted into heat, as the experiments of Mr. Joule have proved. This must cause an elevation of temperature, which will go on until the loss of heat by radiation, conduction, and evaporation, balances the gain by friction, and at this point the temperature of the river will remain stationary.

8th. 'On Graphite Batteries,' by Mr. C. V. Walker.—After referring to the unfitness of copper, and the too great cost of the superior metals for the purpose of batteries, Mr. Walker said he had early sought a substitute for both purpeses, and had found one which seemed to promise all that was required in the deposite of carbon from gas, or graphite.

The Planet of August 22nd, 1852.

To the Editor of the London Times:

Sir,—Having been deputed by Mr. Bishop to find a name for the Planet which I discovered on the 22nd of August, I propose to call it "Fortuna." The following elements of the planet's orbit have been calculated by Mr. Vogel, assistant at this observatory. In addition to our own observations, other taken at the Royal Observatory, Greenwich, and at Cambridge by Professor Challis, have been used in the computations:—

	Deg.	Min.	Sec.
Mean anomaly, counted from the perihelion, 1852, September 10, at Greenwich, noon	321	13	12
Longitude of the perihelion	30	23	29
Longitude of the ascending node	211	35	25
Inclination of the orbit	1	32	13

Eccentricity, 0.157564.
Mean distance from the sun, 2.44093.
Period of revolution, 1.393 days.
This orbit is remarkable for its small inclination to the earth's path.

I remain, Sir, your most obedient servant,

J. R. HIND.

Mr. Bishop's Observatory, Regent's Park, Oct. 5.

MISCELLANEOUS INTELLIGENCE.

The British Post Office.—In the year 1839, under the old system, 75,907,572 letters were delivered, and 6,563,024 franks. In 1840, under the new system, 168,768,344; in 1841, 196,500,191; in 1842, 208,434,451; in 1843, 220,450,306; in 1844, 242,091,684; in 1845, 271,410,789; in 1846, 299,586,762; in 1847, 322,146,243; in 1848, 328,830,184; in 1849, 337,399,199; in 1850, 347,069,071; in 1851, 360,647,187. The net revenue in each of the above years, ending the 5th of January, including the charges on the Government departments, has been—1839, under the old system, £1,659,509; 1840, including one month of the fourpenny rate, £1,633,764; 1841, under the new system, £500,789; 1842, £561,249; 1843, £600,641; 1844, £640,217; 1845, £719,957; 1846, £761,982; 1847, £825,112; 1848, £984,496; 1849, £740,429; 1850, £840,787; 1851, £803,898; 1852, £1,118,004.

Public Revenue and Expenditure of Great Britain.—The state of the public revenue and expenditure from the year 1822 to 1851, inclusive, may be seen at a glance by reference to a return, printed by order of the House of Commons. By it, it appears that in 1822 the total revenue, after deducting drawbacks and repayments, was £59,823,835, and the expenditure £55,079,316, leaving a surplus income of £4,744,518. In 1824 the revenue exceeded that of 1822 by the sum of £5857, but the expenditure was nearly £1,000,000 more. From 1824 the public income gradually declined, until in 1835 it fell to £50,408,579, showing a deficiency, as compared with 1824, of no less than £9,421,112. The expenditure, however, in 1835, was the lowest during the last 30 years, the amount being only £48,787,633 while there was a surplus income of £1,620,092. The revenue and expenditure have steadily increased since 1835, until in 1851 the revenue reached £56,729,390, and the expenditure amounted to £54,002,994, leaving a surplus of £2,726,396. In the 30 years from 1822 to 1851, inclusive, there was a surplus in 19 years, and a deficiency in 11 years. The years in which the expenditure exceeded the income of the country were 1827, 1828, and 1832, from 1837 to 1843 both inclusive, and in 1847 and 1848. The surplus revenue since 1822 exceeded £50,900,009, while the deficiencies did not amount to more than £16,000,000.

Religious Census of Upper Canada.—The following is a return of the religious census of Upper Canada, as taken under the authority of law, in the years 1842, 1848, and 1852:—

	1842.	1848.	1852.
Church of England	128,897	166,340	223,928
Methodists (all)	99,343	137,752	208,611
Presbyterians (all)	115,120	148,182	204,622
Church of Rome	78,119	119,810	167,930
Baptists	19,662	28,053	45,457
Lutherans	...	7,186	12,085
Congregationalists	5,095	5,993	7,931
Quakers	6,230	5,951	7,497
Universalists	...	2,196	2,688
Unitarians	...	678	833
Not classed	23,582	78,461	70,471
Totals	486,055	723,332	952,005

The following are the returns, according to the places of nativity:—

Natives of Upper Canada	523,357
Natives of Ireland	177,055
Natives of England	82,482
Natives of Scotland	75,700
Natives of the Untied States	43,360
French Canadians	26,500
Natives of Germany	9,721
All other countries	13,760
Total	952,005