solution of sulphate of copper were placed in the negative and positive compartments respectively of the apparatus. The positive electrode consisted of a platinum wire, and the negative of a weighed strip of metallic copper.

Experiment.	Time in hours.	Free sulphuric acid.	
		Pos. Compart.	Neg. Compart.
I.	1½	·0766	nil.
II.	2	·0936	nil.
III.	3	·1868	·0191
IV.	3	·1501	·0204
V.	3	·2442	·0237
VI.	3	·2546	·0372

In none of these experiments was there any trace of hydrogen visibly escaping from the negative electrode, while, as will be seen from the table, there was no free acid formed in the negative compartment till two hours or more had elapsed. By that time some admixture in the horizontal part of the apparatus might reasonably be expected, and even in the greatest instance it is small as compared with the amount of salt decomposed.

Similar experiments were made with the sulphate of zinc, with similar results, no hydrogen being evolved, and little or no sulphuric acid appearing in the negative compartment.

We conclude, therefore, that it is not possible to determine the composition, or even to show the presence of a hydrated salt in aqueous solution by means of this electrolytic method.

III. "On the Dynamics of a Rigid Body in Elliptic Space." By R. S. Heath, B.A., D.Sc., Fellow of Trinity College, Cambridge. Communicated by A. Cayley, LL.D., Sadlerian Professor of Pure Mathematics in the University of Cambridge. Received January 4, 1884.

(Abstract.)

This paper is an attempt to work out the theory of the motion of a rigid body under the action of any forces, with the generalised conceptions of distance of the so-called non-Euclidean geometry. Of the three kinds of non-Euclidean space, that known as elliptic space has been chosen, because of the perfect duality and symmetry which exist in this case. The special features of the method employed are

the extensive use of the symmetrical and homogeneous system of co-ordinates given by a quadrantal tetrahedron, and the use of Professor Cayley's co-ordinates, in preference to the " rotors " of Professor Clifford, to represent the position of a line in space.

The first part, §§ 1–21, is introductory; in it the theory of plane and solid geometry is briefly worked out from the basis of Professor Cayley's idea of an absolute quadric. By taking a quadrantal triangle (*i.e.*, a triangle self-conjugate with regard to the absolute conic) as the triangle of reference, the equations to lines, circles, and conics are found in a simple form, and some of their properties investigated.

The geometry of any plane is proved to be the same as that of a sphere of unit radius, so that elliptic space is shown to have a uniform positive curvature.

The theory is then extended to solid geometry, and the most important relations of planes and lines to each other are worked out.

The next part treats of the kinematics of a rigid body. The possibility of the existence of a rigid body is shown to be implied by the constant curvature of elliptic space, and then the theory of its displacement is made to depend entirely on orthogonal transformation. Any displacement may be expressed as a twist about a certain screw. A rotation about a line is shown to be the same as an equal translation along its polar; so that the difference between a rotation and a translation disappears, and the motion of any body is expressed in terms of six symmetrical angular velocities. An angular velocity ω, about a line whose co-ordinates are a, b, c, f, g, h, is found to be capable of resolution into component angular velocities $a\omega$, $b\omega$ . . . $h\omega$, about the edges of the fundamental tetrahedron.

The theory of screws is next considered. A twist on a screw can be replaced by a pair of rotations about any two lines which are conjugate to each other in a certain linear complex. The surface corresponding to the cylindroid is found to be of the fourth order with a pair of nodal lines. Lastly, the condition of equivalence of any number of twists about given screws is investigated.

In kinetics, the measure of force is deduced from Newton's second law of motion, and the laws of combination and resolution are proved. The consideration of the whole momentum of a body suggests the idea of moments of inertia, and a few of their properties are investigated. The general equations of motion referred to any moving axes are then found, and in a particular case they reduce to a form corresponding to Euler's equations; these are of the type

$$A\dot{\omega}_1 - (B-H)\omega_2\omega_6 - (G-C)\omega_5\omega_3 = Q_1.$$

The last part is occupied in the solution of these equations when no forces act, in terms of the Theta-functions of two variables. A solution is obtained in the form

$$\omega_1 = a \cdot \frac{\vartheta_0(x, y)}{\vartheta_{12}(x, y)}, \qquad \omega_4 = f \cdot \frac{\vartheta_7(x, y)}{\vartheta_{12}(x, y)},$$

$$\omega_2 = b \cdot \frac{\vartheta_2(x, y)}{\vartheta_{12}(x, y)}, \qquad \omega_5 = g \cdot \frac{\vartheta_5(x, y)}{\vartheta_{12}(x, y)},$$

$$\omega_3 = c \cdot \frac{\vartheta_9(x, y)}{\vartheta_{12}(x, y)}, \qquad \omega_6 = h \cdot \frac{\vartheta_{14}(x, y)}{\vartheta_{12}(x, y)},$$

where $x = nt + \alpha$ and y is arbitrary. But in order that these values may satisfy the equations, a relation among the parameters of the Theta-functions must be satisfied. This is

$$c_6 c_{10} c_5 c_9 + c_1 c_{13} c_2 c_{14} = 0.$$

The solution is not complete, because after satisfying the equations of motion only four constants remain to express the initial conditions, whereas six constants are required.

IV. "Evidence of a Large Extinct Lizard (*Notiosaurus dentatus*, Ow.) from Pleistocene Deposits, New South Wales, Australia." By Professor Owen, C.B., F.R.S. Received January 9, 1884.

(Abstract.)

In this paper the author describes a fragment of jaw with teeth of a fossil from the pleistocene deposits at the "Cuddie Springs," New South Wales, transmitted by E. S. Wilkinson, Esq., of the Department of Mines, Sydney.

A series of comparisons are detailed with known recent and fossil Saurians, and the microscopic test is applied to the tissues of the bone and tooth.

The conclusion arrived at is that the fossil was part of a lacertian reptile, equal in size to the *Megalania*, but of carnivorous habits; distinct from the largest existing toothed and pleurodont lizard (*Hydrosaurus giganteus*.) For the much larger extinct pleurodont Saurian the author proposes the name *Notiosaurus dentatus*.