see how effective and close a union between our countries of the Entente would in the end be wrought and consolidated by these organs of high industrial control or co-ordination?

In some of the principal industries, therefore, let this first step be taken on the long road still to be travelled. To travel it to the end, once this first step is taken, we shall then be drawn by the shining goal itself that has to be reached: that of the truly intimate union of our two countries, and the federation of the peoples of the Entente on which depend the liberty of the peoples and the peaceful and just re-ordering of the nations.

EUGENIO RIGNANO,
Editor of the International Review *Scientia*.

### The Eötvös Revolving Balance.

IN the issue of NATURE for March 21 Prof. Boys directed attention to a very interesting experiment performed by Baron Eötvös, in which the oscillations of a revolving balance were shown to be an effect of the rotation of the earth.

Precise details of the experiment are lacking, but it would appear that the beam of the balance was adjusted so that its centre of mass lay upon its horizontal axis of swing, and that the latter was compelled to revolve in its own horizontal plane with a definite angular velocity. It was observed that oscillations were set up the amplitude of which was limited by the damping resistance of the air.

In the article referred to Prof. Boys gave reasons for thinking that the expression given by Eötvös for the amplitude in terms of the physical constants involved was incorrect, and offered another in its stead. I think, however, that there is little doubt that when the experiment is performed in the way which the published accounts indicate the Eötvös formula is right.

Suppose we take as a system of moving axes of reference principal axes of inertia of the beam of which one coincides with the axis about which the beam swings. Let this be the axis of $x$, and let it make at the time $t$ an angle $\omega t$ with a horizontal line drawn to the west, $\omega$ being the angular velocity with which the balance revolves. Let the axis of $z$ make an angle $\psi$ with the vertical; then if $\Omega$ is the angular velocity of the earth and $\lambda$ the latitude of the place of experiment, the angular velocities of the axes are

$$\omega_x = -\Omega \cos\lambda \sin\omega t + \dot{\psi}.$$
$$\omega_y = -\Omega \cos\lambda \cos\omega t \cos\psi + (\Omega \sin\lambda + \omega)\sin\psi.$$
$$\omega_z = \Omega \cos\lambda \cos\omega t \sin\psi + (\Omega \sin\lambda + \omega)\cos\psi.$$

If A, B, C are the corresponding moments of inertia, and if we represent the resistance of the air by a couple $-N\dot{\psi}$, we obtain as the equation for small oscillations of the beam about the horizontal

$$A\ddot{\psi} + N\dot{\psi} + (C-B)\omega^2\psi = (A+C-B)\omega\Omega \cos\lambda \cos\omega t.$$

Assuming the beam to be essentially a long, narrow rod, we may put B=o and C=A, and with these simplifications we obtain for $\psi$ the expression

$$2A\Omega \cos\lambda \sin\omega t/N.$$

It is seen at once that the expression is essentially the same as that obtained by Eötvös. The terms representing the free oscillations are omitted, as such oscillations will ultimately be damped out by the resistance of the air. In simplifying the equation, the assumption is made that $A\Omega$ is small compared with N It seems probable that Eötvös used a "small" balance in order to ensure that this condition should be satisfied, for if we compare similar balances $N \propto L^4$ and $A \propto L^5$, where L denotes a linear dimension. If this condition were not satisfied, the character of the motion would be considerably modified.

J. B. DALE.

King's College, June 12.

I HAVE to thank Prof. Dale for pointing out the very serious error that I made when I assumed that the variation of centrifugal force was the only action operative in the Eötvös revolving balance, and I must apologise to Mr. Korda for having treated his account of this beautiful device as inaccurate as well as inadequate.

C. V. BOYS.

### The Discovery of the New Star in Aquila.

CAPT. E. V. PIPER, of Fowey, Cornwall, was observing meteors on the night of June 7-8 between 12h. 30m. and 13h. 0m. G.M.T., and saw seven. He recorded a 1st mag. one at 12h. 45m., which shot to just below Altair from a little above a bright star to the west which he could not identify. This star had a green tinge, and was equal in lustre to Altair. Though he knew the constellations and all the brighter stars in this region very well, he was struck with the strange object to the right of Altair. Mrs. Piper, who came out on the balcony from which Capt. Piper was observing, also remarked on the green colour and flashing light of the star.

Capt. Piper saw the star again on the evening of June 8 at 9.18 p.m., and was puzzled at its appearance, but considered that it meant some phenomenon already well known to astronomers. On Monday, June 10, he saw an announcement in the newspapers that a new star had been discovered in the position where the strange object had attracted his notice on the morning of June 8.

The whole of the facts and circumstances of the observation have been investigated by Mr. T. H. L. Hony, of Fowey, who is an amateur astronomer, and is convinced of the perfect trustworthiness of the details.

Capt. Piper has occasionally sent me accounts of meteors, and they have been very good. It seems to me that the difficult feature to understand in connection with the observation of the star on the morning of June 8 is that it was as bright as on the following night. We know that these objects rise very rapidly to a maximum. The Perseid nova of February, 1901, increased from less than 12th magnitude on February 20 to 2·7 magnitude on February 21 after an interval of twenty-eight hours!

W. F. DENNING

Bristol, June 18.

### The Food of the Rook.

THERE is still so much difference of opinion among those who, like the writer of the note in NATURE of June 6 (p. 271), have examined the contents of the stomachs of rooks as to the economic position of these birds that the time has come when a committee of scientific men should be invited to sift the extensive evidence that is now available and issue a report.

I am in agreement with Dr. Long that the method of balancing one grain of corn as beneficial against one insect as injurious is most fallacious. The corn found in the stomachs of rooks in the summer months (May and June), and a great deal of the corn gathered by the rooks on the roadside or after gleaning in the autumn, would never be garnered by the farmer, but an injurious insect that escapes the visitations of the birds is always capable of considerable mischief.