ing the picture of the upper part of the face, and thus help me to fathom a question which I am persuaded contains the key to many other problems as to the constitution of sound and the organ of sound?

GEORGE IRONS WALKER.

Westbury Street, Sunderland, October 28.

WITH reference to Mr. Walker's interesting letter, which bears out the opinion of Prof. Kunz and others that there is no special development of the other senses in those who have lost the sense of sight, I feel at a loss to give an adequate explanation of the curious experiences described by Mr. Walker. The only suggestion I would venture to make is that Mr. Walker may, by long and almost unconscious practice, have learned to associate certain tones of the voice, as regards quality of tone, with certain movements of the head that he supposes are made by the speaker at the time he utters the words. Tones of inquiry, surprise, reproach, affection, interest, have each a certain quality indicative of states of feeling (unless they are produced by mimicry), and the blind man may draw conclusions as to movement and state of feeling on the part of the speakers. He has then what Mr. Walker calls "a picture of the play of their emotions." I cannot explain why Mr. Walker has almost invariably a picture of the upper part of the face, nor why he prefers to sit at an angle to a public speaker instead of in front. His experience supports the view that the blind have not more acute sensory perceptions than those who see, but that they have cultivated the habit of close attention. This, in turn, stimulates their imagination, and gives them mental pictures of external things that are of no special importance to those who see.

JOHN G. MCKENDRICK.

Movements of the Red Spot Hollow on Jupiter.

TRANSIT estimates of the Red Spot Hollow on Jupiter, obtained between 1908 December 20 and 1909 June 12 inclusive, show that that object exhibited an average monthly increase in longitude of 1·03°. Its motion, however, was not constant, inasmuch as it remained practically stationary in longitude during the last three months (April to June) of the apparition. The rotation periods of the three selected points of the Hollow, namely, the two shoulders and the middle, work out as under:—

Date	Long.	No. of transits	Elapsed rotations	Mean daily drift	Rotation period
		p. Shoulder.			
	°			°	h. m. s.
1908, Dec. 20 ... / 1909, June 7 ...	358·5 / 4·8	16 ...	408 ...	−0·0376 ...	9 55 42·2
		Middle.			
1908, Dec. 20 ... / 1909, June 12 ...	13·6 / 18·4	15 ...	420 ...	−0·0274 ...	9 55 41·8
		f. Shoulder.			
1908, Dec. 20 ... / 1909, June 12 ...	31·1 / 37·1	20 ...	420 ...	−0·0344 ...	9 55 42·1

The mean rotation period of the Hollow, therefore, appears to have been, as nearly as possible, 9h. 55m. 42·0s., a period which is 1·4 seconds longer than that of the adopted value of System II.

At the commencement of the observations, in December, the middle of the Hollow crossed the central meridian about twenty-three minutes subsequent to the passage of the zero meridian, and half an hour at the close of the apparition in June. This lagging behind may be regarded as a distinctly normal movement on the part of the Red Spot.

When the planet was observed last month as it emerged from the sun's rays, the Hollow was found to have moved at an accelerated rate of velocity during the unobserved interval since June. From transits obtained on October 15, 25, and 30, the deduced mean longitude of the middle of the Hollow was then 16·4°. This shows a decrease of 2° when compared with the longitude for June. It is evident, therefore, that the motion of the object had latterly become quickened. Had the Hollow continued to drift at the same rate as was exhibited from December to June, it would have crossed the central meridian ten minutes later than was actually the case last month. Owing to this slight displacement in longitude, the rotation period from June to October was shorter than that for the previous six months, and works out at 9h. 55m. 40·0s.

Leeds, November 21. SCRIVEN BOLTON.

Secondary Kathode Rays.

IN a letter to NATURE of April 2, 1908 (vol. lxxvii., p. 509), I described some experiments of mine which showed that for the corpuscular rays produced in metals by Röntgen rays there was a lack of symmetry between those coming from the side of the metals on which the primary rays were incident and those coming from the side from which the primary rays emerged. The ionisation produced by the emergence secondary corpuscles was, in general, greater than that produced by the incidence corpuscles. This was in accordance with Prof. Bragg's results for the corpuscular rays produced by γ rays (NATURE, January 23, 1908, p. 270).

Since writing the above I have endeavoured to see if this lack of symmetry was dependent on the penetrating power of the primary Röntgen rays. Experiments were carried on only with gold and silver, and gave the following results. The average of four determinations with soft primary rays on silver showed the ionisation produced by the emergence to be 1·11 times as great as that produced by the incidence corpuscular secondary rays; eight determinations with hard primary rays gave an average ratio of 1·21. Five determinations with soft primary rays on gold gave the ratio of emergence to incidence ionisation as 1·03; nine determinations with hard primary rays gave a ratio of 1·09. The probable error of the mean in each case was $\pm 0{\cdot}01$. It would seem, therefore, that there is a slight variation of the asymmetry with the hardness of the Röntgen rays, certainly in the case of silver, and very probably in the case of gold, the harder primary rays causing the ratio of the emergence to the incidence corpuscular rays to increase.

Though the hardness of the Röntgen rays could be varied, they were probably always very heterogeneous. I hope soon to repeat my experiments, using more homogeneous Röntgen rays, which have been recently made possible by the experiments of Prof. Barkla.

CHARLTON D. COOKSEY.

Sheffield Scientific School, Yale University, New Haven, Conn., November 17.

AN INTERNATIONAL MAP OF THE WORLD.

AN International Committee assembled in London on November 15 to consider the form in which it is desirable to prepare a uniform map of the world on the scale of 1/1,000,000, or about sixteen miles to the inch.

The proceedings of this committee have aroused keen interest among geographers, and the results of its labours will be anxiously awaited. The meeting of this committee marks an epoch in map-making, and if its proposals are generally adopted, as no doubt they will be, there will be prepared a map of the whole world, uniform in design and execution, on a reasonably large scale.

Hitherto each country has, in the preparation of its maps, had in view solely its own requirements, and has made no effort to assimilate its maps to those of other countries, either in regard to scale, projection, method of representing hills, or in other points. Maps have been issued differing widely in these respects from those even of the adjoining countries.

The difficulty caused by this diversity of map design has long been felt, not only by those little versed in map reading, but by those who have constant occasion to work with maps.

It was not until 1891 that the first important step was taken towards obtaining a more uniform map of the world. In that year the International Geographical Congress at Bern raised the question, and the London Congress of 1895 passed a resolution recommending the scale of 1/1,000,000, or about sixteen miles to the inch, as suitable for a map of the world. This resolution was communicated to the various Governments in the hope that this scale might be generally adopted.