

hindlegs already extended became more rigid in extensor tone.

At times the ipsilateral foreleg passed from flexion into extension on stimulation of the dentate nucleus; or if originally extended the effect of stimulation was to diminish the tonus. Similarly the hindlegs sometimes showed an inhibition of their tonic rigidity. The tail has been seen to point opposite to the stimulation, whilst the body was curved with the concavity contralateral.

Faradisation of the *nucleus emboliformis*.—This elicited in the ipsilateral foreleg, when previously slightly flexed, more marked flexion at elbow and paw together with adduction. The contralateral foreleg already rigidly extended showed diminished tonus. The ipsilateral hindleg showed inhibition of extensor tonus, the contralateral hindleg increased extensor tonus. The ipsilateral foreleg when originally extended showed inhibition of tonus. The tail was elevated and rotated rapidly. The eyeballs were rotated on the visual axes, the upper parts turning towards the stimulation.

Faradisation of the *nucleus fastigii*.—Manifestations consisted in strong flexion of both forelegs, already somewhat flexed in consequence of the cerebellar ablation; the toes were spread apart. The ipsilateral hindleg was flexed, the toes being separated.

Obviously, from these results, stimulation of the nuclei may yield either an increase or a diminution of tonus, the outcome apparently depending on the functional state, whether of activity or depression, of the infracerebellar centres. It is known that certain regions of the cerebellar cortex yield on stimulation inhibition of muscular tone, and, since these regions are linked with the internal nuclei, the inhibition elicitable from these latter becomes intelligible; thus support is furnished for a doctrine of cerebellar function recently enunciated by one of us, namely, that control of postural tone by the cerebellum may be either in the direction of augmentation or of inhibition (*Physiol. Rev.*, 6, 124, 1926).

FREDERICK R. MILLER.

N. B. LAUGHTON.

Department of Physiology,
University of Western Ontario,
London, Canada, August 23.

The Action of Silica on Electrolytes.

IN a letter to NATURE (January 2, p. 17, 1926), Dr. Joseph suggests that I have modified my point of view. I am rather more confirmed in it. There are really two points at issue between Dr. Joseph and myself. (1) Dr. Joseph holds the view that our usual conception of ionic equilibrium in heterogeneous systems is sufficient to account for the liberation of acids when hydrated silica reacts with electrolytes (*J.C.S.*, 1923, 123, 2022; 1925, 127, 2813). We consider the reaction to be an example of an equilibrium between ions in the double layer and those in solution. As stated in my previous letters to NATURE, we believe that the surface primarily adsorbs anions. (2) Consequently the adsorption of acid by hydrated silica is also to be expected.

I shall take up the second point first. Dr. Joseph denies the existence of what we call 'primary' adsorption. This adsorption is to be calculated after taking into account the diluting effect of water of hydration (*Phil. Mag.*, vi, 44, 1922, p. 337). From the data given in my letter in NATURE of January 31, 1925, it would appear that the water of hydration cannot account for a diminution in concentration of about 90 per cent. The amount of primary adsorption is small and is found to be of the order of 10^{-4} gram

moles of hydrochloric acid per gram mole of silicon dioxide. The failure of Dr. Joseph to confirm our results is to be ascribed to his having used 1 gram of silica and 100 c.c. of solution.

The smallness of the amount of adsorption is not against our point of view, as the adsorption of other anions is likely to be less than that of hydroxyl ions. We have observed that the total amount of acids that can be liberated from these samples of silica by repeated washing with saturated solution of potassium chloride is 6×10^{-4} gram equivalents of acid per gram mole of silica (*Quarterly J. Indian Chem. Soc.*, vol. 2, 1925, 211).

We shall now deal with the first point. In his second paper (*loc. cit.*), Dr. Joseph observes that calcium silicate is more insoluble than the corresponding barium salt. Dr. Joseph also states that solubility relationships explain the observations regarding the interaction between silica and neutral electrolytes. On this basis it is to be expected that under identical conditions calcium should, in contact with silica, liberate hydrogen ions at a higher concentration than barium chloride. On the other hand, from theoretical considerations of the effect of these cations on the electric charge of the surface of hydrated silica, barium should have a greater effect than calcium, and consequently barium should liberate hydrogen ions at a greater concentration. This is what we have observed, and I think the observation cannot be explained from Dr. Joseph's point of view based on considerations of solubility as usually applied to such reactions.

We have also observed that at higher concentrations individual differences between different cations decrease. Here also solubility relationships fail even if we consider the formation of some sort of solid solution. Besides silica there are other systems, e.g. manganese oxides, which behave similarly.

J. N. MUKHERJEE.

Physical Chemical Laboratory,
University College of Science,
92 Upper Circular Road, Calcutta.

The British Patent Office.

IT is to be hoped that the arguments in the leading article in NATURE of September 18, for reforms in the patent system which would increase the chance of an issued patent being valid, will have effect.

It is undoubted that the value of a patent would be increased if the British Patent Office were given greater powers by the enlargement of the field of the investigation made as to novelty and by allowing the Patent Office to pronounce on the question of quantum of subject matter. The Patent Office examiners in Germany, for example, have this power, so why not those in England? It is common experience that the investigation as to novelty now made by the Patent Office examiners is, within the limited powers granted to them, more efficiently carried out than in any other country. One difficulty in the way of allowing the Patent Office to give a definite decision on validity is not so great as it appears. It is very doubtful whether 'prior user' alone is often the determining factor in deciding the invalidity of a patent. In most cases the relevant process or article has been described also in a patent specification or in text books or periodicals of the art. It is to be noted that in Holland, where the powers of the Patent Office examiners are great and their attitude towards claims strict, the validity of a patent is guaranteed after five years' freedom from successful attack.

It would help to inspire confidence in the worth of