Elmer Keiser Bolton, for research in chemistry at Berlin.

Richard Maurice Elliott, for research in psychology, particularly in the psychophysics of handwriting, at Berlin and in the various psychological laboratories of Germany.

Harvey Cornelius Hayes, for travel in the United States, between September and February, for the purpose of observing the manufacture of alloys.

Sidney Isaac Kornhauser, for research in zoology at Würzburg and at the Naples Zoological Station.

Edward Hale Perry, for travel in the mining districts of the United States during the summer of 1913.

Joseph Slepian, for research in mathematics in Europe.

Paul Dudley White, for research in pharmacology at London and Strasburg.

Professor Ernest J. Berg, of the department of electrical engineering of the University of Illinois since 1909, has resigned that position to return to a similar position at his alma mater, Union University, at Schenectady, N. Y., and also to become consulting engineer of the General Electric Company of that city.

Professor R. W. Thatcher, director of the Washington Agricultural Experiment Station and head of the department of agriculture of Washington State College, has been elected professor of agricultural chemistry and soils in the University of Minnesota, the appointment becoming effective on May 1.

DISCUSSION AND CORRESPONDENCE

ELECTROMAGNETIC INDUCTION AND RELATIVITY

To the Editor of Science: In the last number of Science (March 14) Professor A. L. Kimball expresses the opinion that my recent experiments on electromagnetic induction are "not so definitely in contradiction to the principle of relativity as may appear at first sight," basing his conclusion on the fact that in certain cases the indication of a measuring instrument depends upon the manner in which it is connected to the apparatus under test.

This is a very important point, but it is naturally one which I had not failed to consider with great care. That no fallacy was made in reaching my conclusion will be evident, I think, from what follows.

Case I.—In my own recent experiments the cylindrical condenser, with its armatures A and B connected together by a wire C, remained at rest while the agent producing the magnetic field, whose direction was parallel to the common axis of the two cylinders, was rotated. The short-circuit by the wire C was then interrupted, *leaving the inner conductor B completely insulated. After the rotation was stopped and the field annulled,* B was tested for charge by connection to an electrometer. *No charge was detected.*

Case II.—Now imagine the condenser, together with its short-circuiting wire C, to rotate while the agent producing the magnetic field remains fixed to the earth. If the wire C is now interrupted, *leaving B completely insulated from A,* and if the condenser is then brought to rest and the field annulled, the cylinder B, *tested exactly as in Case I., will be found charged.* While the experiment in this form has not been made, the result given is an *immediate and necessary consequence* of the experiments by Faraday and others referred to in my earlier article. For no one will contend that in this case the seat of the motional electromotive force is elsewhere than in the wire C and in the dielectric, if any, entrained by the conductors in their motion. Moreover, that the ether is not entrained, and that the entrainement of any air would produce no appreciable effect, are facts which follow from some of the experiments (those on insulators) already referred to. In addition to these considerations only one assumption is necessary to the argument, viz., the assumption that an electric charge of one sign on an insulated conductor is not altered by being brought to rest from a state of motion.

Thus the condenser is actually charged in one case and not charged in the other, the relative motion in the two cases being exactly the same. If complete relativity existed, the condenser, tested in the way described, would be found to have the same charge in the two cases.

In connection with Professor Kimball's remarks it is of interest to consider also the behavior of two electrometers E and E', one of them, E, fixed within the condenser with its terminals rigidly connected to the armatures A and B, and the other, E', fixed to the magnet, with terminals sliding on A and B. In Case II. E' indicates a voltage equal to the motional electromotive force in the wire C, and E gives no deflection—*not because the condenser is uncharged, but because the motional electromotive force in the electrometer and its leads just balances the voltage in the electric field produced between A and B by the motional electromotive force in the wire C.* In Case I. E again gives no deflection, *there being now no electric field between the armatures and no charge at all on the armatures;* and E' gives the same deflection as before—but whether for the same reason or not is still an open question. It is apparently because Professor Kimball was considering these ambiguous electrometer indications instead of the actual charges on the cylinders that he was led to his conclusion. S. J. BARNETT

THE OHIO STATE UNIVERSITY,
March 18, 1913

A LABELING SURFACE FOR LABORATORY GLASSWARE

THE ground-glass circular spot now generally furnished on flasks and beakers made of Jena glass suggested to the writer the desirability of a similar labeling surface for microscopic slides, test tubes and other laboratory glassware. Attempts to use hydrofluoric acid showed that the acid in solution would dissolve the glass but would not etch it. "Diamond Ink" made by Merck and obtained from Eimer and Amend was found to give satisfactory results. "White Acid," obtained from the same firm, produces a less heavily frosted surface, but has been used to dilute the diamond ink when the latter has become unduly thickened. Diamond ink comes in gutta-percha bottles and etches glass immediately upon coming in contact with it. The hydrofluoric acid, which is apparently one of the constituents, is volatile. When a bottle has been opened, the fluid tends to creep out by capillarity along the salts that have been deposited by evaporation. The bottles, in consequence, should be kept sealed with paraffine when not in use.

In using, a small amount only of the creamy diamond ink is poured into a stender dish which has been previously coated with paraffine. A rubber stopper has been found to be the best means of applying the ink. One end is dipped into the ink and then pressed against the glass to be etched. If the right edge of the stopper is first touched to the glass and the pressure shifted from right to left and reversed, the fluid is evenly distributed and a small amount only is necessary for the even-edged circular spot which results. The etching takes place at once. The surface, however, is covered by a thick deposit of deliquescent salts which must be washed off before the ground-glass surface is ready to receive pencil marks. Ordinary glassware is easily marked by the method outlined, but the Jena glass tested is etched with more or less difficulty and has been ground on an emery wheel.

Adhesive paper labels are impracticable for test tubes or flasks that have to be sterilized with steam or that are kept in a moist atmosphere where they are liable to the attacks of moulds. Wax pencils, or better, indelible copying pencils moistened with alcohol are useful for temporary labels, but do not withstand steam sterilizing and are not permanent when much handled. Marking diamonds and certain silicate inks have the disadvantage of leaving a written label that can not be removed. A label written with lead pencil on an etched or ground-glass surface, however, has the advantage of permanency so far as ordinary laboratory handling is concerned. It is as permanent as pencil marks on paper and, like these, can be removed with a rubber eraser. The pencil marks are not affected by water nor by steam, but may be readily removed by scouring soaps. In cleaning test tubes, it has been found convenient to remove