sulphur was used in place of flowers of sulphur. The flowers of sulphur were treated to remove volatile sulphides. A large number of blanks were run wherever there was any doubt existing about results being influenced by sulphur blown back into the discharge tube. We found tubes easily contaminated until we used plastic sulphur.

During the course of this work a paper by Wartenberg and Shultz was published (*Zeit. Physik. Chem.*, **6**, 261; 1930) showing that orthophosphoric or metaphosphoric acid may be used successfully to poison the walls of a Wood's discharge tube in the production of atomic hydrogen.

Our experimental evidence further supports R. W. Wood's theory, and offers an explanation of the discrepancies existing regarding the production of triatomic hydrogen in discharge tubes.

We can duplicate the work of Urey and Smallwood if we remove the oxygen from the gas stream. If we introduce a trace of oxygen we check the results of Wendt and Landauer (*Jour. Am. Chem. Soc.*, **42**, 930; 1920. *Ibid.*, **44**, 510; 1922).

We wish to express our appreciation to the Canadian National Research Council for aid during the course of this work.

J. L. BINDER.
E. A. FILBY.
A. C. GRUBB.

University of Saskatchewan.

### Pleochroism and Crystal Structure.

IN a very important paper (*Phil. Mag.*, vol. 33, p. 521; 1917), Silberstein developed a theory of molecular refractivity based on the idea that the electric doublets induced by the field of the light wave in the atoms composing the molecule influence each other, the result of such atomic interaction largely depending on their relative distances and the geometric form of the molecule. One important consequence of Silberstein's theory, namely, that gaseous molecules should in general be optically anisotropic, is supported by observation, and has been worked out in detail by Ramanathan, Havelock, and others; it also forms the basis of W. L. Bragg's well-known and successful attempt to compute theoretically the birefringence of the solid carbonates and nitrates from their known crystal structure.

In the present note we desire to direct attention to another important consequence of Silberstein's theory, namely, that atomic interaction induces pleochroism in ions or molecules: such pleochroism would become accessible to observation when they are regularly oriented as in a crystal. In a recent paper (*Ind. Jour. Phys.*, vol. 4, p. 1; 1929), Sir C. V. Raman and S. Bhagavantam have indeed suggested that the colour and pleochroism of solid organic compounds arise in this way. We have made some observations on the absorption of *polarised ultra-violet light* in crystals of sodium and potassium nitrates which appear to be very significant in this connexion.

It is known from the X-ray evidence that the $NO_3$ ions form a plane structure normal to the trigonal axis in sodium nitrate and to the pseudo-hexagonal axis ('c' axis) in potassium nitrate. We have found that the selective absorption at about 3000 A. which appears in aqueous solutions of the nitrates manifests itself in the solid crystals only when the vibrations are in the plane of the $NO_3$ ions; vibrations of this frequency perpendicular to the plane of the $NO_3$ ions are freely transmitted by the crystals. Further, beyond about 2600 A. begins another region of strong absorption in the crystals which is also polarised in the same direction as the 3000 A. band. It is also found that while the refractive index of the ordinary ray shows a rapid increase even in the visible region with diminishing wave-length, the corresponding increase in that of the extraordinary ray is much slower. These observations taken together with W. L. Bragg's work on the birefringence of the nitrates appear to indicate that the basic ideas of Silberstein's theory are substantially valid.

K. S. KRISHNAN.
A. C. DASGUPTA.

Physics Laboratory,
Dacca University,
Dacca, May 19.

### Sense of Smell of Longicorn Beetles.

IN the notice of Ivar Trägårdh's paper on the pine-sawyer pest in Sweden, which appeared in NATURE of April 5, page 546, doubt is expressed that longicorn beetles are attracted by means of their sense of smell "to trees in the condition they require for oviposition". The writer of the notice cites an opinion held some twenty years ago that the Indian sal heartwood borer, *Hoplocerambyx spinicornis*, discovers newly felled trees by an unerring 'instinct' ("Indian Forest Insects", p. 323).

Recent field-work on the biology of *Hoplocerambyx* supports the contention of Trägårdh, for the beetles (of both sexes) react immediately to the smell of a newly felled *Shorea robusta*, and in particular to that of the sap freshly liberated by the act of felling. If beetles happen to be near at hand, they discover the tree in the course of a few minutes. By cutting isolated sal trees in open country, it is possible to attract beetles in less than an hour from forest at a distance of at least half a mile. I have observed that the beetles approach upwind, flying low, and in a remarkably straight course towards their objective; with an appreciable breeze no beetles appeared from the forest to the windward. Arrived at the tree they drink the sap. As this species is on the wing during the monsoon season, they are not attracted to the tree for the sake of water only.

In the course of a day or two the attraction of the felled tree diminishes considerably and the beetles disperse; but by logging the tree or by stripping off the bark, or by otherwise exposing fresher sap, the attractiveness of the tree can be renewed for a further short period, and new beetles appear.

This principle has been used in the control operations against the sal heartwood borer during the recent serious epidemic in Central India; by means of trap-trees felled at appropriate periods and inspected systematically, millions of beetles have been collected and destroyed.

C. F. C. BEESON.

Forest Research Institute,
Dehra Dun, India, May 20.

### Kekule and Kolbe.

I WRITE Kekule without an accent, as he was a descendant of old Bohemian nobles, the Kekule de Stradonice, whose ancestors, being Bohemian brothers, had to emigrate after the battle of the White Mountain (1620); it is he whom we thank for the reform of organic chemistry. As a man of Slavonic origin Kekule was a 'romanticist' and arrived at his doctrine of the chemical structure more by genial intuition than by experimental investigation (see Brauner; "Collection" II., 225). On the other hand, I agree with my old friend, Prof. Armstrong, who said in his excellent review (NATURE, May 31, 1930, pp. 807-810) that the rôle played by Kolbe in our science is often