

be worth while to look for the corresponding emission band ( $\lambda = 1-1.5 \mu$ ) in fluorescence.

Chlorophyll is capable of assimilation only if it is in a special state, as is the case in living plants. Mr. K. Meyer, of Zurich, informs me in a private letter that he has probably succeeded in producing solutions *without* loss of assimilating activity. At any rate it may be presumed that the active state is not *very* different from the free state. So an application and elaboration of the preceding considerations does not appear to be out of place. Slight changes in the spectrum will of course accompany the transition to the active state; especially a decrease of fluorescence yield is to be expected as the energy of state *A* is now used for the chemical process.

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### Science and Psychological Research

As there has been some publicity over the resignation of the various scientific men who originally consented to serve on the Research and Consultative Committees of the International Institute for Psychological Research, and as the chairman of this body has made in print various assertions on the matter, we feel it desirable to give a brief statement of the facts.

We were originally approached by Dr. Fraser-Harris, the physiologist, who told us that this new organisation, of which he had been asked to be the "whole-time Research Officer", was intended to investigate questions of supernormal psychology by scientific methods, and that its supporters intended to raise large sums of money for this purpose. On these grounds we allowed our names to be used. Nothing further occurred until a public appeal was printed in the *Times* of April 7, 1934. An advance copy of this was supposed to have been sent to the scientific personnel, but it did not reach them until April 8, so that the members of the Consultative Committee were not notified of its impending appearance. At an early date, Dr. Fraser-Harris clearly saw that he was not to be allowed to direct the campaign for publicity in the manner and place which he considered best. The appeal was couched in such terms that we felt it necessary to resign from any connexion with the Institute. Some resignations were sent in at once, others after correspondence with the Institute. The chief ground for our resignation was the wholly non-scientific attitude thus revealed, for example, the statement that the Institute would at first concentrate on making the *proof* of survival its primary object. Unwarranted attacks on other bodies concerned with psychological research also contributed; and finally the fact that no members of the scientific personnel were consulted in framing the appeal or laying down policy did not augur well for the carrying on of the Institute on a scientific basis.

We would also like to record our strong disapproval of the treatment accorded to Dr. Fraser-Harris. After ten months without any remuneration except reimbursement of postage expenses, he was offered a small sum for one year and asked to "get to work" in the seance-room of the London Spiritualist Alliance (!), no mediums or scientific apparatus being provided, much less the laboratory originally proposed. By May 28, conditions had become so impossible that he resigned, having given eleven months'

service, which interfered materially with his other work. A subsequent attack on him by the chairman of the Executive Committee of the Institute in *Psychic News* was abusive in tone, and contained a number of inaccurate statements.

We think it worth while to record these facts publicly, as they show the difficulty of scientific men collaborating with professed 'spiritualists', as were all those actively concerned with the inception of the Institute. They appear either to have no idea of what constitutes scientific method, or to have thought that they could obtain a dummy committee of scientific workers to confer scientific respectability on a propagandist enterprise. We are of the opinion that the investigation of so-called 'supernormal' phenomena is a very fruitful field for scientific research; but to secure the new knowledge we need an intelligent co-operative attitude, not only on the part of those who approach the subject from the scientific side, but also of those who approach it from the side of spiritualism (spiritism).

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### Determination of Dipole Moments in Solution

RECENT work on the estimation of dipole moments in solution, particularly by Muller<sup>1</sup> and Jenkins<sup>2</sup>, has shown that, contrary to that which was formerly believed, the apparent dipole moment of a substance in solution is not independent of the non-polar solvent in which it is measured, although in the case of each solvent the polarisations of the solute are extrapolated to infinite dilution. The apparent dipole moment decreases as the dielectric constant of the solvent increases. As a further consequence of this effect, the temperature variation of the polarisation at infinite dilution in a given solvent leads to a value of the moment which is too low, since the dielectric constant of the solvent decreases as the temperature rises.

Several attempts have been made to correlate these results with the moments measured in the vapour state, and to deduce from measurements in solution, a moment which shall be independent of the solvent.

Sugden<sup>3</sup> has shown that if measured values of the molecular polarisability  $P_2$  in solution are plotted against the corresponding values of the volume polarisability  $(\epsilon - 1)/(\epsilon + 2)$  for solutions of benzonitrile, nitrobenzene and chlorobenzene in a number of non-polar solvents, the points for each substance all lie near a straight line, the slope of which is approximately equal to  $P_2\mu$ , that portion of the total polarisation which is due to the permanent dipoles.

During the discussion at the symposium held by the Faraday Society at Oxford last April, I pointed out that if the formula suggested by Prof. Sugden,

$$P_{\text{liq.}} = \alpha + P_{\text{gas}} - P_2\mu(\epsilon - 1)/(\epsilon + 2),$$

were of general applicability, then  $P_{\text{liq.}} \sim (\epsilon - 1)/(\epsilon + 2)$  lines for the same solute at different temperatures would converge to a common point at  $(\epsilon - 1)/(\epsilon + 2) = 1$ , and that the moment could be obtained from the slopes of the lines.

There were then no data to test this. I have now measured the polarisation of nitrobenzene in solution in decane (di-isoamyl) and in *p*-xylene at concentra-