

With respect to the comparison of the light, in the journal of Columbus, with "the flame of a small candle alternately raised and lowered", and its disappearance soon after, the illuminating display of a single *Odontosyllis* female will at such times usually show this feature of separate short periods of excessive and declining brilliance, repeated two or three times over, or more. From the poop of the *Santa Maria*, it is easy to believe that this light would be visible on a dark night up to 200 yards, or even farther, away. As probably as not, the strange and unaccountable light would disappear almost as soon as there was time to report it.

As observed at Abaco, and within a limited area, the species concerned ordinarily frequents grounds of shallow water, and up to about 2 fathoms in depth, though probably extending much outside this. The displays, though variable in time, usually occur about the time of low water, or within an hour, or occasionally as much as 2½ hours, on either side of this. If the light was seen by the *Santa Maria* about 10 p.m. on the night of October 11, and the moon rose an hour later, as recorded, the moon was then presumably about one day before the last quarter. The time of low water, probably about 7.30–8.00 p.m., is comparatively unimportant, considering the variability in the time of appearance of the syllid in this respect. The latest time of display definitely noted by me in examples at Abaco was 8.30 p.m.

Murdock in his chart, followed by Lieut.-Comdr. Gould, shows the course of Columbus passing round the south side of Watling's Island. Mackenzie, who makes the landfall at Cat Island, shows it on the north side. In the latter case, there is a large shallow bank, with rocky heads, extending out for some 3½ miles from the present low-lying northern shore of the island; a position near the northern point of

this bank, as shown in the chart of Mackenzie with indication of the position of the light, would leave little difficulty in explaining not only the presence of the Syllid as the source of the light, but also the passing of the island unobserved in the darkness at such a distance. At or near the extreme northerly point of this inner bank, there is little cause to doubt that the ships may have passed without striking or even sighting any submerged reef head, if then here existing.

As against the estimated distance of the position of the light at some thirty-five miles or so eastward of the landfall, and considering the frequent difficulty found in reconciling distances recorded with those existing between positions, as interpreted in the itinerary, it is on the whole a remarkable coincidence in the present connexion that the distance from the northern bank of Watling's to the south-east point of Cat Island is about 43 miles.

The primary purpose in the present discussion is to direct attention to a very probable explanation of the mysterious light observed on the night before the landfall was sighted, hitherto without any satisfactory explanation suggested, and thus leaving inevitably a weak point in the data employed for conclusions so reached regarding the identity of the landfall. The inference that it was Cat Island has its own difficulties, the greatest of these being, as it seems, its distance as recorded, about 18 miles, from the second island, while assuming the latter to have been Rum Cay. In any circumstances, I am unable to see how the incident of the recorded light can be regarded otherwise than as a point of evidence of first importance towards settlement of the problem.

¹ *Geographical J.*, May 1927.

² *Trans. Amer. Micro. Soc.*, 30, No. 1; 1911; republished in the *Con. Bermuda Biol. Sta.*, June 1916.

³ *Proc. Camb. Phil. Soc.*, 17, Part 2; 1913.

National Water Resources

THE joint committee of Lords and Commons, appointed to consider and report on measures for the better conservation and organisation of water resources and supplies in England and Wales, held an inquiry during the month of July last, and completed it for the time being. The evidence given before the committee with a report of the proceedings, after being tabled in the Houses of Parliament, has been published*. The findings of the committee are set out in six resolutions, the first of which, affirming that the aggregate available supply of water is ample for all anticipated requirements of the country is, at least, reassuring, and should dispel whatever doubts (if any) have been entertained on this score; though it is little satisfaction to those who have experienced the serious inconveniences of the recent drought to know that, while locally there has been scarcity and restriction, elsewhere supplies have been plentiful and even running to waste.

The real crux of the situation is contained in the second resolution, which admits that a number of problems of distribution, compensation and similar

* Joint Committee on Water Resources and Supplies (Session 1934–35). Vol. I, Proceedings of the Committee, 2d. net; Vol. II, Minutes of Evidence, together with an Appendix, 3s. 0d. net. (H.M. Stationery Office.)

matters are outstanding, and should be dealt with without delay. Taken in conjunction with the third finding, that sufficient material and experience is possessed by the Ministry of Health to enable the legislation necessary to deal with the problems to be drafted, there is a distinct implication that the Ministry of Health has been remiss in not coping with the difficulty before. Indeed, the main trend of examination by the committee of a departmental witness went to show that the former considered it was being called upon to discharge a duty which was superfluous, and the reason put forward by the secretary of the Ministry in support of the appointment of the committee was that it was for the purpose of getting the advice of an "impartial and competent" body on points of conflict which were known to exist, but which the Ministry, apparently, had made no direct effort to ascertain or define. Sir Arthur Samuel, a member of the joint committee, expressed himself pointedly if colloquially, when he asked Sir Arthur Robinson, "Are you not asking us to hold the baby for you and do the work which you yourselves ought to do, to shield you?"

It is scarcely surprising, therefore, that the remaining resolutions of the committee should call for the

preparation by the Ministry of Health of a preliminary memorandum on matters of controversy, to be circulated to all parties likely to be interested, in order to enable evidence in criticism to be heard after the recess, the committee feeling that, until the issue of such a memorandum, no useful purpose could be served by hearing further evidence on the subject-matter before them. The absence of any

witnesses to speak on the industrial side of water user was, in fact, the outstanding feature of the inquiry, so far as it has gone, and it rather seems to indicate that trade and industry have been ignored by the Ministry in the prosecution of its plans. The unwisdom of such a step is surely obvious in connexion with "a question which raises interests very much wider than the interests of the Ministry of Health".

Road Width and Accidents

THE cause of road accidents is a topic which gravely concerns every class of the community, and each attempt to determine the degree to which any one factor operates in promoting road safety deserves general attention. From the point of view of safe driving, it is probable that there is an ideal width of road for each set of traffic conditions and that, at a certain traffic density, the division of the roadway into separate 'up' and 'down' tracks becomes advisable.

It is of interest, therefore, to read in *Roads and Streets* (Chicago, July 1935) a paper submitted to the Highway Research Board by Prof. R. L. Morrison, of the Department of Highway Engineering at the University of Michigan, entitled "Effect of Pavement Widths upon Accidents". The main object of the author's investigation was to find evidence bearing upon the desirability of building 20 ft. roadways instead of the smaller widths which had been adopted as adequate to allow of the passage of two vehicles. It is obviously difficult to make a rigid comparison in figures between any two roads, equal or unequal in size, and this is intensified by the uncertain data obtainable regarding many accidents, and by the absence of figures relating to minor unreported accidents which might yield valuable evidence.

In this investigation, several portions of roads are

dealt with, and figures are given regarding (a) 34 miles of 20-ft. roadway and (b) 19 miles of 18-ft. width. After eliminating those unrelated to road width and found to occur at the rate of (a) 1.06 and (b) 0.90 accidents per mile, the author finds that those which are affected by road width occur at the rate of (a) 1.00 and (b) 1.70 per mile. This last figure on being adjusted in order to obtain a comparison on a common basis is increased to 2.20, but here the reasons given are not quite convincing, though they may be justified by a personal knowledge of the roads and their conditions. If, however, we take from the detailed analyses given in the paper the figures for accidents which can be accounted to grossly careless driving—the main cause of preventable accidents—the rates are (a) 0.53 and (b) 1.10.

These figures strikingly support the final comparison ratio deduced by the author, whose conclusion is that, on the grounds both of the accident rate and on the relative costs, of which figures are adduced, the 20-ft. roadway is justified. The author agrees that his data are not sufficiently extensive for general conclusions to be drawn, but suggests that the method of analysis might be adopted as a general approach to the problem. The figures dealt with are understood to relate to the accidents occurring in one year.

Biological Effects of Different Regions of the Spectrum

AT the red edge of the invisible in the spectrum there is a narrow band of light waves which have a powerful and hitherto unsuspected biological inhibitory effect. This is reported by Lewis H. Flint, of the Department of Agriculture, and E. D. McAlister, of the Smithsonian Institution (*Smithsonian Misc. Coll.*, 94, No. 5, June 24, 1935), as a result of further studies of the germination of dormant lettuce seeds when exposed to radiation.

Previous studies by Dr. Flint had demonstrated that such seeds could be made to germinate by exposure to red, orange and yellow light; and inhibited from germinating by irradiation with green, blue and violet light. The inhibitory effect was general for this upper end of the visible light spectrum, but reached its greatest intensity at wave-lengths of about 4200 and 4800 Å. in the blue-green region.

The discovery of an inhibitory wave-band at the red end of the spectrum which, so far as the germination of lettuce seeds was concerned, was more powerful

in its effects than the entire green-blue-violet end of the spectrum, came as a complete surprise. This band lies around the critical wave-length of 7600 Å., at just about the point in the red where light ceases to be visible to the human eye.

Ordinarily its effect would be masked by the stimulating effect of the wave-lengths surrounding it, especially in sunlight. Perhaps fortunately for vegetation—although the inhibitory influence has been demonstrated only with lettuce seeds—the solar radiation in this neighbourhood is greatly reduced, owing, it is believed, to its absorption partly by oxygen in the atmosphere of the sun and partly by water-vapour in the atmosphere of the earth. Notwithstanding this absorption, however, the energy of solar radiation at this point is large.

Further studies of the possible effectiveness of this region in respect to the germination of other seeds and in respect to other phases of light sensitivity are now in progress.