a counter-illuminating animal changes in the water its camouflaging light could become a disastrous beacon. One of the stumbling blocks of a camouflage hypothesis is that submersible observations sometimes describe how many fishes seem almost randomly orientated in the water[85,86], though the animal may not necessarily be luminescing[87]. Certain decapod and euphausiid shrimps can alter the orientation of their photophores[88,89], and this would be an effective means of compensating for changes in their orientation in the water. A further difficulty raised by bathysphere observations is the visibility of luminescing fishes. If their camouflage is effective they should not be visible. Yet Beebe[90] could "plainly see the lights of their (hatchetfishes) downwardly-directed photophores when the fish swam above me". These observations seem somewhat at variance with the camouflage concept of ventral luminescence. Nevertheless, there is now very considerable evidence, albeit still largely circumstantial, providing support for the hypothesis.

Observations of bioluminescence are always fascinating and often perplexing; their interpretations are even more so. Both observations and interpretations have a long history of suspicion, or outright disbelief. In the early eighteenth century a letter was received by the French Academy of Sciences from the people of Cadiz[1] "importing that . . . they had seen the whole sea shining with a clear light almost like a liquid phosphorus, . . . the seawater being carried away in bottles gave the same light in the dark; that some drops of it being let fall on the ground shone like sparks of fire, and that linnen dipt in this water became luminous." The Academy responded to this quite accurate description of dinoflagellate luminescence by retorting "The fact having been well examined, is found to be false, . . . The Academy think, they do as much service to the public, in disabusing them with regard to false wonders as in recounting to them the true." In which category would they have included the Puget Sound *Porichthys*, fishes with a complete battery of mainly ventral photophores—none of which work?

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A hundred years ago

RAINFALL OBSERVATIONS IN THE EAST OF FRANCE FROM 1763 TO 1870.—In the *Bulletin Hebdomadaire* of the Scientific Association of France, of the 10th instant, Prof. Raulin gives an interesting historical account of all the rainfall observations made during these 108 years anywhere in that section of France which is marked off by lines joining Givet on the Meuse, Lauterbourg on the Rhine, Belley near the Rhon, and Decize on the Loire, and which thus comprehends seven well-marked regions, viz., the plain of Alsace, the chain of the Vosges, the plateaux of Lorraine and Bourgogne, the plains of Champagne and Bresse, and finally the chain of the Jura mountains. During the past three years Prof. Raulin has been engaged collecting all available materials for a monograph on the rainfall of this part of Europe, which, judging from his great monographs of the rainfall of other sections of France and of the rainfall of Algeria, will doubtless take its place as a permanent contribution of very high value to meteorological science.