

The white or yellowish eels, occasionally found, owe the disappearance of color to nervous causes due to sex, and the enlargement of the eyes is connected with the same cause, of a nervous and emotional nature.

*Psychological* or, as I prefer to distinguish them "*Emotional*" colors, are apparently due to intense temporary nervous states, recalling the "pallor," or the "redness" in the human face due to fear or to anger respectively. The cuttle-fishes rapidly change color, becoming red, green, or yellow under different emotional states, which influence the nerves affecting the chromatophores or large pigment spots, and iridescent plates in the integument. A captive Octopus when annoyed by a goad assumes a deep crimson color as though red with rage. Many fishes assume the most varied, often extremely beautiful colors, when dying. The large moon-fish or opah (*Lampris luna*) exhibits flitting rainbow tints, while the 3-spined stickleback (the male at least) acquires a deep scarlet tint about the throat, and the sides glisten with golden green. The 10-spined stickleback (*G. pungitius*) becomes inky black about the throat and abdomen, paler on the sides, before death. Sex coloration may be included under the heading "emotional" and what is called "sexual selection" is probably wholly secondary and subordinate in spite of Darwin's famous observations on the subject. Some of the most gorgeously-tinted male animals known to me do not support Darwin's view. Certain Pacific salmon, for example, notably the sockeye (*Oncorhynchus nerka*) coming in from the sea are of a steel-blue color; but the males change to a bright rose pink or madder on approaching the spawning grounds. For hundreds of miles countless numbers of these brightly tinted fish may be seen crowding the great rivers of the West. In the shallow upper waters tens of thousands occur in the Fall like struggling armies of "gold fish," 200 to 1,000 miles from the sea. Swiftly through the water foaming over the pebbly shallows, the crowded male fish speed, and fight and kill each other, and the gorgeously colored victors assume greater brilliance under the excitement. Any selection by the more sober-tinted female fish is out of the question in the terrible turmoil and rush. Like the antlers of deer and other seasonal out-growths in various animals, the colors referred to are the physical and visible expression of emotional