

As to what is the mode of life of *Spirula*, Agassiz has supposed, from the disposition of the chromatophores, that the posterior part of the living individual remains plunged in the mud at the bottom. However, in the two specimens taken by the Challenger and the "Blake," it is noticed that it is precisely at the posterior part that the chromatophores are specially preserved (Pl. II. figs. 1, 2; Pl. VI. fig. 14). Further, the funnel of *Spirula* is as well developed as in the other Cephalopods. This animal is not then sedentary, but a good swimmer, which the existence of fins at the posterior part likewise confirms; these fins would evidently not be found there if the part were plunged in the mud.

If we now compare the following facts: on the one hand, that *Spirula* is a swimmer and that it keeps to the greater depths (since it never has been observed living at the surface or near it), and on the other hand that as soon as dead the animal is carried away by its shell towards the surface, we ought evidently to conclude that the living animal compresses a part of the gas contained in the "phragmocone," apparently the gas enclosed in the siphuncle, and this by the action of the pallio-siphonal sinus, as has been explained above (see Circulatory System).

The rarity of *Spirula* is thus explained by the abyssal nature of the animal. That the animal is extremely rare is proved by the fact that among the inhabitants of certain islands of the South Pacific—where the shells of *Spirula* are extremely abundant—the opinion prevails that the shell "has no animal."

The circumstance that the individuals found floating, or thrown up on shore, are generally incomplete and mutilated, might be explained by the interpretation of Robert, according to whom Siphonophores (*Physalia*) prey upon *Spirula*; he says¹ that one of the specimens captured by the "Recherche" "had been taken among the tentacles of a *Physalia*."

IX. PHYLOGENY.

The systematic position of *Spirula* among the Dibranchiate Cephalopods is in no way fixed. In 1879, Brock expressed the opinion that *Spirula* must be ranked among the Myopsid Decapods.² But in a later work³ he retracted that view, declaring that *Spirula* had nothing to do with the Myopsids, that it is doubtful if it be an Œgopsid, and that it probably represents a special group. In 1881, Steenstrup maintained,

¹ *Comptes rendus*, t. ii., 1836, p. 363.

² Brock, Studien über die Verwandtschaftsverhältnisse der dibranchiaten Cephalopoden, Erlangen, 1879, p. 21.

³ Brock, Versuch einer phylogenie der dibranchiaten Cephalopoden (*Morph. Jahrb.*, Bd. vi., 1880, p. 84).