tracheal branchiae, showing that the branches of the tracheae end caecally. In this case the branches are so few that their terminations can be easily made out.

The importance of this anatomical item depends on its bearing on the functions of the whole tracheal system. The action of the tracheae is tidal rather than by peripheral capillary circulation. Here also the endings of the ramifications are found to harmonize with their internal terminations along the nervous and digestive tracts, and in other parts of the tissues which they supply. We never find a double system of tracheae with capillary rami-

fications interposed for the transmission of air from one system to the other. It is not easy, in the living insect, to determine the ebb and flow directly; as the movements occur suddenly, have their speed multiplied by the degree of microscopic amplification; and hence we are able only to see the rhythmical peristaltic action, and are left to guess at its cause. We find, however, the muscular contractions and expansions of other parts of the body synchronizing with the pulsations in the gills, and thus explaining how the flux and reflux, rather than a mere circulation of the air, is the cause of its renewal.

Princeton, N. J., 12 Dec. 1883.

THE SCREW-WORM FLY, *COMPSOMYIA MACELLARIA*.

BY SAMUEL WENDELL WILLISTON, NEW HAVEN, CONN.

IN connection with Professor Snow's article on this fly ¹ it seems worth while to give a brief synopsis of papers published in the past few years by the able dipterologist of South America, Dr. E. L. Arribáizaga, of Buenos Aires. From his studies he has ascertained no less than twenty-six different specific names that this fly had received! It is possible that some of these names would apply to distinct species were their types examined, but it is a thankless task to endeavor to make order out of the chaos in which Walker, Macquart, and Robineau-Desvoidy have involved the subject, and the result of Arribáizaga's thorough studies can with propriety be adopted.

To these results, however, Mr. J. Bigot, of Paris, has recently taken exception, in a note ² on Professor Snow's paper. This author's penchant for making synonyms himself may perhaps have something to do with his wishing to preserve species founded on inadequate grounds. His argument that "*il me semble fort hasardeux d'avancer qu'un seule et même espèce se retrouve, en permanence, depuis les confins de la Patagonie jusqu'au delà des provinces centrales de l'Amérique du Nord, vivant indifféremment sous les zones torrides, tempérées et même froides?*" is of little value, when the

Psyche, Mar.-Apr. 1883, v. 4, p. 27-30.

² Bull. soc. entom. France, 12 Sept. 1883, no. 17, p. 154-155.

author himself should know that other American flies *do* have a similar range of habitat, to say nothing of the nearly allied *Musca domestica*.

The specimens which Professor Snow sent me for examination, although somewhat injured, certainly seem to me to be *Comptosomyia macellaria* (Fab.) E. Lch. A. The species may, with tolerable certainty, be recognized by its having a bright metallic green or coppery color on the abdomen and thorax, the latter above with three black stripes; the bristle of the antennae feathered to the tip, and the head, except the eyes, chiefly yellow. In size it varies from seven to ten millimetres.

However, these systematic details will be of less interest than the following, which I translate from the Spanish of Arribáizaga³:

"During the pleasant days of spring or the hotter ones of summer, these flies may be seen covering in great numbers, now umbelliferous flowers, now all sorts of filth; or, resting, there glistens in the sunlight the iridescent surface of their half-opened wings, and the blue, the green, the violet, the copper and the gold of their metallic colored bodies."

"Our fly deposits its eggs, commonly called '*queresas*,' in dead bodies, in manure, in fresh meat reserved for food, and soon there appear immense numbers of voracious larvae that rapidly consume the objects in which has begun their active life. Not content with these habits, common to all the species of

the group to which it pertains, it deposits the germs of its posterity in the wounds of men and of animals, at the entrance of openings of the human face, and, in its anxiety for propagation, will deposit them in the wool of sheep."

"Azara was, I believe, the first observer who noted cases of human myiasis in South America. Coquerel, many years later, called the attention of physicians and naturalists to the frequent and fatal accidents which this evil produces among the exiles of Cayenne: according to this author, Dr. Chapuis, physician-in-chief of the French marine, attended one case in which the larvae of *C. macellaria* had penetrated to the frontal sinuses, causing the death of the patient; also one very unclean person attacked in the nasal fossae and the pharynx, who succumbed after he had ejected one hundred and twenty larvae. There were, as M. St. Pair observed, in the same country, six similar cases, of which three terminated in the death of the patients after cruel sufferings; in two the nose was destroyed, and in the last there was a deformation of the olfactory organ. In another case observed by M. St. Pair there were removed, by means of injections, more than three hundred larvae, but he was not able to obtain them all, and the remainder soon penetrated the ball of the eye, destroying the lower eyelid in consequence of gangrene, invaded the mouth, corroded the gums and laid bare the inferior maxillary; the victim died seventeen days after his entrance into the hospital."

³ Anales de la soc. científica argentina, v. 10, p. 80-84.

After giving records of numerous other cases he further adds :

"To Dr. Lesbini, of Córdoba, are due the better observations upon cases of myiasis produced by *C. macellaria*. The first case presented itself in an old foreigner who had an ulcer in his leg filled with these larvae ; the second case occurred in Córdoba, in a boy of seven years, attacked in the left ear ; the third and last case was in a girl of sixteen years, also of Córdoba, affected in the nasal fossae by the presence of two hundred and fifty larvae : all these patients were saved."

"It is probable that, attracted by the fetid odor of unclean individuals, these flies hover over the mouth or the nose,

and thus deposit their eggs ; some affirm that they at times enter the passages for this purpose."

"The area of distribution of *Comptosomyia macellaria* is very great, and will be, I believe, yet greater with time, since their habits facilitate their transportation by man from one region to another ; hitherto they have been observed in the following countries : Islands of America (*Musca macellaria* F.), N. America (*Chrysomyia tibialis*, *C. pherminieri*, *C. caerulea*, *C. decora* *C. plaei* R.-Desv.), Mexico (*Lucilia hominivorax*), Cuba, Colombia, Venezuela, Cayenne, Brazil, Peru, Chili, Uruguay, Argentine Republic and New Holland."

INFLUENCE OF COLOR ON INSECTS.—The following extract from the recently published second part of vol. 1 of "Timehri," the Journal of the Royal agricultural and commercial society of British Guiana, so ably edited by Mr. E. F. im Thurn, may be of interest to our readers. It occurs in an account of a visit to Mount Russell in Guiana, by the editor (p. 223) :—

"That afternoon the Indians of the place, seeing our interest in catching butterflies, exhibited various clever ways of entrapping these insects. To catch those of yellow hue, they picked and laid on the ground the flowers of a yellow *Bignonia* (*B. chieka*) ; and this proved a most successful plan. Equally successful were they when they laid decaying banana-skins on the

ground to attract the large blue *Morphos* ; but an attempt to attract certain red species by displaying the ripe red fruit of the faroah plant (*Bixa orellana*) was not successful. Then, these methods of enticing the insects were completed by inverting a round quake (a wide-mouthed basket of very open wicker-work) over the bait, taking care to raise the quake so that its lower edge was some inches from the ground. The butterflies, attracted by the flowers, made their way under the raised edge of the quake, and when the Indians approached flew, not out under the edge of the quake, but upward into the top, where they were captured."—E. C. R., in *Entomologist's mo. mag.*, June 1883, v. 20, p. 15-16.