

the five pairs of walking and nipping legs). But no such realisation of the ideal can be found in Astacine nature, any more than in that of the higher Catarrhines. In some crayfish more or less of the leg-gills are suppressed; in others, the body-gills; in others, the joint-gills; and so ringing the changes on the combination of these elements, it is possible to construct clearly-distinguished groups amongst the crayfishes of many climes, which at first sight seem to differ very little from one another. Further, Prof. Huxley shows that crayfishes and lobsters differ from prawns, shrimps, and crabs, in having villous gills

instead of laminated gills, in being "trichobranchiate" in place of "phyllobranchiate."

It will probably not be welcome news to some of our readers that the English crayfish is in all probability not entitled to the current title of *Astacus fluviatilis*. This name appears to belong to a larger species, sometimes called *A. nobilis*, hardly distinguishable from the English one, which in France lives side by side with it. The smaller crayfish, which alone occurs in England, is known as *A. torrentium*. This specific title will, it is to be feared, have to be adopted, although it by implication casts a slur upon the River

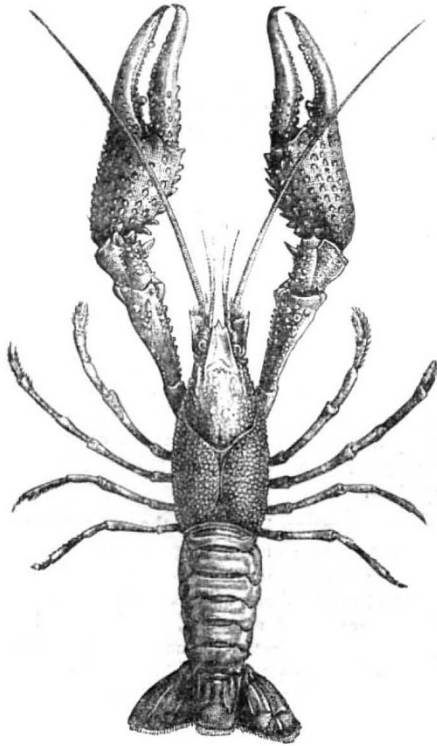


FIG. 4.

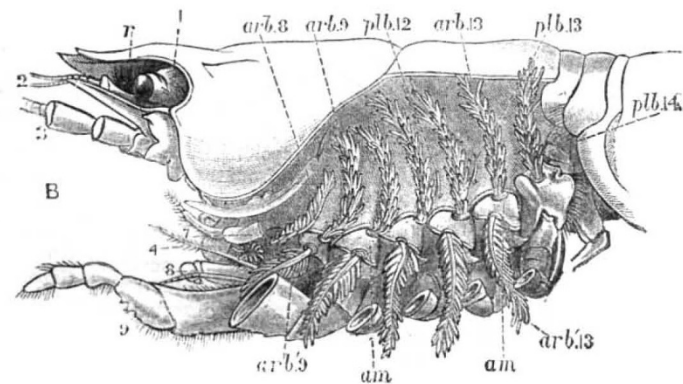
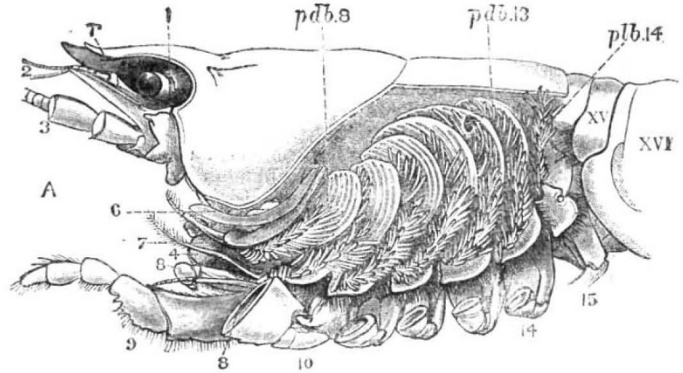


FIG. 5.

FIG. 4.—*Cambarus clarkii*, male ($\frac{1}{2}$ nat. size), after Hagen. FIG. 5.—*Astacus fluviatilis*.—In A, the gills, exposed by the removal of the branchiostegite, are seen in their natural position; in B, the podobranchiae are removed, and the anterior set of arthrobranchiae turned downwards ($\times 2$): 1, eye-stalk; 2, antennule; 3, antenna; 4, mandible; 6, scaphognathite; 7, first maxillipede, in B the epipodite, τ which the line points, is partly removed; 8, second maxillipede; 9, third maxillipede; 10, forceps; 14, fourth ambulatory leg; 15, first abdominal appendage; xv., first, and xvi., second abdominal somite; arb. 8, arb. 9, arb. 13, the posterior arthrobranchiae of the second and third maxillipedes and of the third ambulatory leg; arb'. 9, arb'. 13, the anterior arthrobranchiae of the third maxillipede and of the third ambulatory leg; pδb. 8, podobranchiae of the second maxillipede; pδb. 13, that of the third ambulatory leg; pδb. 12, pδb. 13, the two rudimentary pleurobranchiae; pδb. 14, the functional pleurobranchiae; r, rostrum.

Isis. *A. fluviatilis* has red tips to its legs and a rostrum which differs by a notch or two from that of *A. torrentium*. Further, and this is very curious, *A. torrentium* never has been found to be infested by that very interesting parasite (more interesting even than the crayfish itself), the crab-leech, *Astacobdella*, or *Branchiobdella*, whilst it is quite abundant on the *A. fluviatilis*, at any rate in some rivers (e.g., the Saale, in North Germany).

A. fluviatilis is largely eaten in France, attaining to the very respectable size of 5 inches or so in length, whilst our smaller *A. torrentium* is neglected from this point of view. We can recommend it, however, when boiled in salt and water, as nearly if not quite equalling the prawn.

The poisonous properties of the flesh of crayfish might perhaps be considered as justly falling within the scope of the first chapter of Prof. Huxley's treatise. As in the case of many mollusca and some true fishes, there appears to be a substance present which acts as an irritant poison upon the human organism, and to its action some persons are more liable than are others, whilst certain conditions of the crayfish seem to favour the development of a large amount of this poisonous body. A case was recently reported in a French medical journal, of the poisoning of six persons who partook of a dish of crayfishes—in one case with fatal result.

E. RAY LANKESTER

FOGS

THERE are fogs and fogs,—from the one extreme of the dry fog of continental meteorologists which merely blurs the sky with a bluish-tinted mist and shears the sun of its brilliancy as it nears the horizon, so that the eye can look on its disk undisturbed, to the other extreme

of our genuine London fog which at times condenses to a consistency so thick as to give point to the sketch in *Punch* some years ago, representing a street-boy springing into the air, exclaiming "I am monarch of all I survey."

Fogs appear under widely different conditions. Thus the waters of the Arne occasionally appear for some distance after issuing from their icy cavern, like a steaming

torrent of heated water. In this case, the fog which is seen to rise from the river is caused by the cold water condensing the vapour of the warmer air above it, which at the time happens to be near the point of saturation. Similarly, the Mississippi, which flows directly from colder into warmer latitudes, is often enveloped in mists or fogs. On the other hand, when the waters of a river are considerably warmer than the air over them, the vapour rising from them is condensed into fog by the colder air through which it ascends; and in such cases the fog will be the denser in proportion to the stillness of the air and its nearness to the point of saturation.

What have been called radiation fogs make their appearance during calm clear nights when the air in contact with the ground gets cooled by radiation, and becoming thereby heavier necessarily flows downwards in much the same way as water, towards the lowest levels, and floods all the low-lying grounds, mingling with and diffusing itself through the moister air of the low grounds, and condensing its more abundant vapour into fog.

Still further in such calm cold weather as has been prevalent for some weeks in the south of England, the temperature of the land falls at a greatly more accelerated rate than that of the sea. When this happens the interchange of light airs and light breezes which set in from the sea landwards and *vice versa* along a considerable extent of coast, mixes the colder with the warmer and more humid air-currents, and thereby lays a thick covering of fog over the surface.

There is yet another fog of great significance in the study of atmospheric circulation, which spreads over a much wider extent than any of the other fogs referred to. This is the fog which is frequently found in the region of the outskirts of the anticyclone, or rather in the debatable region between the cyclone and the anticyclone. The most probable explanation of it is that it arises from the diffusion of the vapour brought up by the cyclone outwards and through the colder and drier air of those parts of the anticyclone contiguous to it, where it is condensed into immense breadths of fog frequently stretching several hundred miles in length. Much yet remains to be done in instituting, even, an exact and systematic observation of this important weather phenomenon from the results of which we might hope to come at some knowledge of its true meaning and its significance in forecasting weather, particularly those changes of weather which terminate long tracts of fine dry weather.

Now if we examine the weather charts from new year's day to the present time, it is seen that the south-east of England has been constantly either within anticyclones or under their immediate influence, the centres of which kept shifting to and fro over a rudely shaped quadrilateral marked off by Corunna, Sligo, Copenhagen, and Bucharest. During nearly the whole of this time, London has been within the belt of fog and mist which continuously, or discontinuously, has been skirting the margin of these anticyclones. At the same time the air has been unusually calm. Thus at Greenwich for the four weeks ending January 31, the mean daily horizontal movement of the air was only 144 miles, being 182 miles less than the average; and during the five foggy days in the last week of January the daily movement of the air was 269 miles under the average.

Hence, then, the fogs which London has had in common with the south of England and parts of the continent opposite, have been intensified by the low temperatures and still atmosphere bringing from time to time their contributions of radiation fogs and other fogs, still denser, drifting ever and anon through the heart of the city from the adjoining sheets of salt and fresh water. The last touch in the production of the very worst character of these fogs was doubtless given by the smoke of London, in the manner explained by Sir John Herschel in his

"Meteorology," whereby each particle of soot acting as an insulated radiant, collects dew on itself, and sinks rapidly down through the fog as a heavy body, thus giving to these fogs their yellow thick consistency and the suffocating and unwholesome sensation experienced in breathing them.

In the weekly reports of the Registrar-General for December, 1873, several deaths are certified as having been more or less directly caused by the extraordinarily dense fogs which then prevailed; and in one of the reports it is remarked that "In the large provincial towns, where the same cold weather was unaccompanied by fog, the increase in the mortality was slight compared with that which occurred in London." In the last week of January, when the fog was so dense, the deaths in London from whooping-cough rose to 193,—a fatality from this disease hitherto unexampled in the London bills of mortality. A careful examination of the weather and health of London, particularly as regards the deaths resulting from throat and nervous complaints, could not fail to contribute materially to the diffusion of a better knowledge than we yet possess of the influence of these fogs on the public health.

NOTES

DR. BROCA, the eminent anthropologist, has been elected a life member of the French Senate by a majority of eight. This election has created some sensation, Dr. Broca's nomination having been opposed on the ground of his Darwinist opinions. Dr. Broca opened the last meeting of the Anthropological Society by a short address, in which he considered his election as a victory gained not only by his political, but also by his scientific opinions.

ALMOST a panic has occurred amongst the wine-growers of Cape Colony, in consequence of the supposition that not only was the *Phylloxera* causing the destruction of some of the choicest vines, but that it had existed there, undetected, for several years. An influential, and somewhat animated, meeting was held at Cape Town to discuss the subject. We understand that samples of the vines, supposed to have been attacked by the pest, were forwarded to the Colonial Office and sent on to Kew, and that these have been examined by Mr. McLachlan, who is of opinion that all the characteristic signs of the action of *Phylloxera* are absent, and that nothing is shown to induce uneasiness in the minds of South African wine-growers on this score. The samples had been packed in the worst possible condition for minute examination; but according to a report in a Cape paper, Mr. Roland Trimen, of Cape Town, had examined samples submitted to him on the spot, and pronounced a similar opinion. Some of the vines are undoubtedly in an unhealthy condition, from unexplained causes. It is to be hoped our Cape colonists will not allow panic to take possession of them, and, under its influence, rush into extremes. It is probable that some of the South European nationalities that have carried the absurdity of panic to its highest limit—to the extent of confiscating a bouquet of wild flowers in the hands of unsuspecting rambles—unwittingly permit the importation of "contraband" vines to a large extent.

ACCORDING to the report of the French Phylloxera Commission, the pernicious insect has spread in a deplorable manner during the last two years, in spite of all measures to the contrary. The black patches on the maps of the Commission, and which represent those districts over which the plague has a complete hold, must be enlarged year after year. Great hope was placed in snow, but it proved futile, inasmuch as snow must cover the ground for at least forty-five days to destroy the insects, and nowhere has the snow lasted so long as that. About one-quarter of the French wine-growing districts are now destroyed. All disinfectants prove useless, and it seems hopeless