

A Synonymic Catalogue of Insect Lepidoptera.

By W. F. Kirby. Van Nostrand.

In this libation writes the author of a useful little *Manual of European Butterflies* gives a list of all the species of butterflies described up to the date of publication, with references to all the chief authorities and the various names under which each has been described or referred to. The native country of every species is also given, thus affording valuable materials for the study of geographical distribution. The general reader will be surprised to learn that this list of the names of butterflies takes an entire volume of two pages, there being more than nine thousand described species and varieties of butterflies; and as many of the specific names occur several times over, the index, which consists of 136 columns of very close print, contains about twelve thousand separate references. When we consider that this volume contains only the true butterflies (the moths being many times more numerous), some idea may be formed of the immensity of the range of the entomologist's studies. The value of such a work to students is very great, while the labor of compiling it is of the most tedious and unremunerative kind; and although some books of place and of date could be pointed out, it would be ungenerous as it is unnecessary to refer to them here. The work is published by Mr. Van Nostrand, and every naturalist who can afford it should add it to his library, not only for its intrinsic value, but as a recognition of the service bestowed on science by its painstaking author. A. R. WALLACE.

THE ALLEGED "OPEN POLAR SEA"

TO THE EDITOR OF THE JOURNAL.

SIR,—Neither the telegram announced by Dr. Petrusson nor the letter from Mr. Payer to the Franklin Society by any means imply a new discovery, still less a discovery of "an open Polar Ocean." Mr. Payer states simply that in about lat. 80° N. there was open water extending from 80° to 82° E., or about twenty miles, and again in 80° E. in thirty-six parts of the season; and that this water abounded in whales. This fact is merely a confirmation of a long series of observations in the sea between Spitzbergen and Wrangels Land, by Smith and subsequent navigators. The Polar pack, in this part of the Arctic Sea, has usually been found in 80° during the navigating season; but in several years, when the heavier fields have not drifted lower during the summer, reach here, towards the end of the season, sometimes within six or seven days. On May 21, 1861, Scoresby observed his lat. in 80° 15' 42" N. In 1862 Captain Gillis reached the parallel of 81° and Captain Hallinger and Byrd's found indications of extensive open water midway between Spitzbergen and Wrangels Land, in a subsequent year. This is simply because the heavy Polar pack had not drifted south as usual, while the lower strata had been cleared away by the seasonal prevalence of prevailing winds. Mr. Payer has hit upon a similar year. The old drift whalers called these years "soft or easy," because the ice had drifted much further north, in earlier and later days, after breaking away from the great Polar pack; and the ice open water much further to the north. In such years the whalers steered in the sea, instead of going up the west coast of Spitzbergen. The whaler seen by Mr. Payer is a sign of the new proximity of ice; and the fact that these whalers came down from the north, towards the end of the season, is a proof that there is not sufficient open water round the Pole, in the late autumn and winter, for them to breathe in.

All this has been well known for centuries. The Polar pack is usually met with in the navigating season, between Spitzbergen and Wrangels Land, in 81° or 82°. Whales reached it in 82° 30', and Wood in 80° 30'. In every second year it is not encountered until the land parallel is reached. But no discovery worth recording will have been made until either the Polar pack has been passed, or the open sea has been imagined; how far in the place has been reached. We know the minimum width of this Polar pack; the ice is often forty miles over the lower parts for 30 miles, and at its extreme point a strong ice bank was seen on the western horizon with a yellow stain, showing the field ice. Here we have a certain width of 100 miles at least, possibly

more than. This Polar ice is in fields often 30 miles wide by 100 long, and is to be broken first. An exploring steamer, reaching the pack in summer, must bore through it, if it can, and then she will be lost; for the young ice is formed during nine months of the year to latitude 80°. Mr. Payer now leaves well enough, when "extensive geographical errors" will be corrected, that proving ice, forming in October, will very soon clear away from a narrow channel, and is by no means to be depended on.

This is not the reason for such Polar explorations.

A writer in the *Illustrated* of November 11 repeats the fallacies of the "wide unobscured ocean" to which "Whangul gave the name of Polaris," and of Mörner's "well of a boundless sea" in Kennedy Channel. Polaris is merely the Russian name for a water hole in the ice, and was in vogue long before Whangul's time. That explorer found the ice to be broken at a distance of about 100 miles from the Siberian coast, and on two occasions open water covered with floating icebergs was seen in the offing. Hultemann and Arago also saw open water within miles of 75° 30' north in March. But these accounts, however true, are the results of local currents in a rapid drift-way. The "boundless ocean" in Kennedy Channel was a water hole, or *polaris*, named by the same discoverer. It exists on the evidence of a single witness, the King's steward, and Dr. Hayes found the same locality to be entirely frozen over when he visited it. It is interesting to find writers repeating these unproved fallacies, and indulging in speculations which were considered innocently true in the days of confusion of the North.

There are here five incontestable errors in the name of Arctic research. The way to explore the unknown Polar Region has been pointed out by Captain James Oglethorpe, whose views are shared, not only by McClintock and other experienced English Arctic officers, but by Captain Kullerberg, the accomplished and intrepid leader of the Russian expeditions. That officer, as soon as he had acquired actual experience in the ice, was convinced that the practical Oglethorpe was right, and that the theoretical Petrusson was wrong. This delightful proving about the edge of the Polar pack, with arrangements of "icebergs and snows" every time a water hole is reached, is more waste of money and labor. You will equipped expeditions up North, Iceland, with others instructed by men like Oglethorpe, McClintock, or Kullerberg, would explore all the Greenland coast, reach the North Pole, and with most of these Arctic expeditions in one season, while every arrangement of science would receive benefits from the results of such an expedition.

C. R. MERRIAM.

Scientific Notes.

Physiology.

Respiration of Fish.—In his valuable lectures, now in course of publication in the *Annals*, Mr. Gilchrist makes several interesting generalities in the respiration of fishes. In the first place, as was to be expected, he states that the water which enters the gills is able to live in water until almost the whole of the oxygen it contains is in a state of solution has been used up. Mr. Gilchrist fully corroborates these statements. In one experiment he placed five goldfish, weighing 75 grammes, in a tank containing 1100 grammes of water, at a temperature of 15° C. Cent. A liter of this water was found to contain 7.4 c.c. of oxygen, by a s. l. of nitrogen, and 7/8 of carbonic acid. At the expiration of five hours and a quarter, the animals being in absolute rest, the remaining water was found to contain 6.5 c.c. of oxygen, and 1.5 c.c. of carbonic acid, &c. In other words, the oxygen remaining dissolved in the water had altogether disappeared, and had been in amount of carbonic acid had been added to the tank. Another curious point was that fish breathe by their skin as well as by their gills, nearly as great a change in the composition of the gases contained in the water being observed when the animals were suspended up to their heads as when the whole body was exposed to the air. It was found that the quantity of oxygen of the remaining tank had little effect on the products of respiration.

Anatomy of the Brain.—A very delicate account of the anatomy of the brain appears in the recently published part of Huxley's *Manual of Zoology*, now in course of translation by Mr. Henry Fowler for the New York Science Society; and a paper by the same author appears in the *Philos. Abstr.* (Linnæus), headed by Huxleying it, on the cerebral proposition of the spinal column. The former is too difficult and complicated the any related to be given of it, but is the latter the picture is so good. That the cerebral proposition of the spinal column is not accompanied by the roots of the spinal nerves, as is often supposed, has been already shown by a dissection from the head of origin of the anterior nerve, &c. The cerebral proposition of the eye is sometimes so called in the medical