SCIENCE.

FRIDAY, MAY 9, 1884.

COMMENT AND CRITICISM.

THE German government has most commendably recognized the interest of the public in the reports made by the leader of the commission which has been studying the cholera in Egypt and India. The letters already so promptly published are, of course, merely notes of progress sent to the base of supplies; and no detailed and complete report can be expected at present. So far as the results have been made known, the work of the commission is full of promise. For the cholera, which, by the way, is only one of the subjects under investigation, a bacterium, apparently peculiar to the disease, has been found; and its cultivation has shown characteristics sufficiently marked to render its recognition easy. This comma-shaped bacillus has not, thus far, been found in connection with any other disease of the intestinal tract, although numerous examinations relative to this point have been made; and in cholera patients, it was only seen in association with the intestinal disturbance, but here invariably. It has, however, been met with in some sources of water-supply in India, in which the local infection may have originated.

It should not be forgotten that this work of Koch is no mere lucky guess. Bacteria were found by him in material sent to Berlin from India; but it was then impossible to decide how far putrefactive changes had produced them. The commission has now been able to examine a goodly number of fresh cases (fifty-two dead, and forty sick, from cholera), and thus to render the pathogenetic character of the bacillus exceedingly probable; and yet not a little remains to be done to complete the demonstration. Unfortunately, no inoculation experiments have thus far succeeded, owing to the remarkable insusceptibility of our household animals to cholera; and experiments on our own species are not permissible. It is also desirable to have more certainty as to the life-history of these bacilli, which may reach the victim as spores. The fact that they are chiefly found in the lower part of the small intestine suggests such a development, unless it be due to a temporary disablement of the bacillus as it passes the Scylla of gastric digestion, and the Charybdis of the bile inflow; the former being known to be dangerous, while the latter is inferentially so. Should Koch's conclusions prove to be correct (and, of course, corroboration by other and independent observers is desirable, and ought to be comparatively easy), then protection against cholera would seem to be a pretty simple task, even though its destruction at the fountain-head be impracticable. The germs do not appear to be very tenacious of life, so that an efficient prophylaxis can be readily exercised; and here a sound digestion becomes of primary importance for the individual. The season of intestinal disturbances is upon us, so that the work of the German commission can readily be supplemented in one direction in any of our hospitals.

TWELVE years ago the thorough-going policy of the British admiralty in fitting out the Challenger expedition inspired us all with a hope that a new kind of governmental policy, in support of biological investigation, was being inaugurated. American as well as English naturalists have therefore been greatly disappointed, that, since the return of the Challenger, the British government has done practically nothing to forward marine research. The economists of the Manchester school are still in the ascendant; and the study of aquatic life is evidently to be left, like the hospitals, the asylums, the life-saving service, fish-culture, and the prediction of the weather, to private enterprise, either individually exerted or in combination in societies.

It was felt by many English men of science that a portion of the surplus of the late fisheries exhibition might appropriately be applied to the scientific investigation of the English seas, since this course would undoubtedly be very beneficial to the fishery interests of the nation. The very handsome sum remaining at the disposal of the directors has gone, however, almost entirely to build homes for the families of fishermen lost at sea. In deference to the vote of the British association for the advancement of science, in support of the plea of Professor Ray Lankester, a small sum is assigned to a 'Royal fisheries society,' yet to be organized, in whose future it is difficult to imagine any great benefit to result, either to science or to the fisheries.

Public opinion in Great Britain seems to demand the organization of a series of investigations similar to those which have for a number of years been carried on by our own fish-commission. At a meeting of fishermen in Peterhead, in January, a petition was forwarded for government aid for a scientific research into the habits of fish; and the representative fishery capitalists of Ireland are equally urgent. The meeting at the Royal society's rooms, a few weeks ago, for the organization of a 'Society for the biological investigation of the British coasts,' was evidently a part of the same movement. The endowment of fifty thousand dollars, which it is proposed to secure by private subscription, will doubtless be readily forthcoming; and we may safely predict for the new society the career of success which it deserves to have. Although not a direct outcome of the fisheries exhibition, it may fairly be considered one of its results.

THE presentation of a petition, by a large number of Canadian naturalists, to the postmaster-general, requesting the government to "take into consideration the matter of a naturalists' exchange post for Canada, and for the other countries within the postal union," is a step which should meet the approval of naturalists in this country, by whom some organized attempt ought soon to be made to procure a modification of the existing regulations. As far as inland postage on specimens of natural history is concerned, no serious complaint can be urged against the postage charged, or the limit of weight allowed. The provision, however, that no written matter can be sent with the specimens, except at letter-rates, is a serious obstacle in many instances; for it frequently happens, that, as in case of marine plants mounted on paper, it is necessary to mark the locality and date on the paper at the time the specimen is collected. Without such written data, the specimens lose half their value. The rulings of the post-office department in Washington, with regard to written labels or notes giving the scientific name, locality, and date of collection, have been contradictory, and, as a matter of fact, naturalists are unable, except in an underhanded way, to send any but printed labels at the cheap rates; and, as every one knows, in by far the majority of exchanges labels must be written rather than printed. At the last meeting of the American association, a committee was appointed to consider the best way of presenting to the post-office department the claims of naturalists. It is said that the committee intend to report some plan of operation at the next meeting in Philadelphia.

With regard to foreign exchanges, of course no action can be taken without the action of the delegates of the postal union; and the Canadian naturalists desire to have the subject brought before the convention to be held in Lisbon next October. If we correctly understand the petition of the Canadian naturalists, they are now able to send packages not over eight ounces in weight, at sample merchandise rates, to countries in the postal union. If this is the case, they are much better off than we are in this country; for our post-office department has distinctly declared that no specimens of plants sent as botanical exchanges can be forwarded, except at letter-rates, no matter whether there is any writing

on the specimens or not. This is not the arbitrary ruling of any local office, but the written decision from headquarters in Washington. Such being the case, exchange of specimens with foreign countries is practically prohibited; and this seems all the more absurd, we may even say contemptible, when it is known that Christmas cards, and several other articles not classed in any way as samples, are allowed to be sent at sample-rates; furthermore, that from several foreign countries, packages of specimens are allowed to be sent to the United States at the cheap rate. Under the circumstances, it may, perhaps, be asked whether our Canadian friends are not going too far in asking that specimens not exceeding in weight four pounds, nor exceeding twenty-four inches in length by twelve inches in width or depth, be sent at the rate of one cent for four ounces. To be sure, such an arrangement seems to be eminently proper; and all naturalists should unite in bringing the measure before the Lisbon convention. In any event, the present embargo on scientific exchanges, whether caused by the illiberal interpretation of the rules of the postal union by our post-office, or by any ambiguity in the rules themselves, should be removed.

LETTERS TO THE EDITOR.

**** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

Inertia.

As Mr. E. H. Hall (*Science*, vol. iii., No. 63, p. 482) referred to Maxwell, Thomson, and Tait, as *the* authorities in regard to the use of the word 'inertia,' it seems to me it would have been well for him to explain what Maxwell meant when, in reviewing Thomson and Tait's Natural philosophy, he said, —

"Again, at p. 222, the capacity of the student is called upon to accept the following statement: —

"'Matter has an innate power of resisting external influences, so that every body, as far as it can, remains at rest, or moves uniformly in a straight line.'

"Is it a fact that 'matter' has any power, either innate or acquired, of resisting external influences? Does not every force which acts on a body always produce exactly that change in the motion of the body by which its value, as a force, is reckoned? Is a cup of tea to be accused of having an innate power of resisting the sweetening influences of sugar, because it persistently refuses to turn sweet unless the sugar is actually put into it?" (*Nature*, vol. xx. p. 214).

Did Maxwell mean by these questions to deny the statement of Thomson and Tait?

S. T. MORELAND.

Lexington, Va., April 21.

The method of measuring the inertia of a body, proposed by Mr. Hall in No. 63 of *Science*, p. 483, is identical with a mode of measuring the mass of a body. Does he consider *inertia* as identical with *mass?* If not, wherein is the distinction? Whatever be the language describing it, or the ideas concerning it, Newton says it "differs nothing from the inactivity of the mass, but in our manner of conceiving it." Here *inertia* and *mass* are, by implication at least, not identical. W.

April 23.

The recent article by Mr. Hall on 'inertia' is especially to be deprecated, because it may lead many to regard the ideas relating to it as in some sense indefinite. The source of the whole difficulty is that the word has been used in two perfectly legitimate senses, — one qualitative, and the other quantitative. In the qualitative sense, it simply implies the truth of Newton's first law of motion: in the quantitative sense, it is mass, and nothing else. This double use of the word has been fully recognized for a generation by all accurate scientific thinkers; and, on account of this ambiguity, all careful writers and teachers have practically long since abandoned it. Above all, it ought to appear in no text-book, just because it has a double sense.

This statement as to the usage of careful teachers is directly opposed to that of Mr. Hall, who mentions Thomson and Tait, and *quotes* Maxwell in support of the position which he occupies. As no teacher is clearer in his presentation of elementary ideas, nor more precise in his choice of words for conveying them, than Maxwell, either my statement or Mr. Hall's quotation demands revision. That the latter alternative is the proper one, I shall prove by quoting the whole of the passage of which Mr. Hall quotes only a portion of one sentence: —

"In a rude age, before the invention of means for overcoming friction, the weight of bodies formed the chief obstacle to setting them in motion. It was only after some progress had been made in the art of throwing missiles, and in the use of wheel-carriages and floating vessels, that men's minds became practically impressed with the idea of mass as distinguished from weight. Accordingly, while almost all the metaphysicians who discussed the qualities of matter assigned a prominent place to weight among the primary qualities, few or none of them perceived that the sole unalterable property of matter is its *mass*. At the revival of science, this property was expressed by the phrase, 'the inertia of matter;' but while the men of science understood by this term the tendency of the body to persevere in its state of motion (or rest), and considered it a measurable quantity, those philosophers who were unacquainted with science understood inertia in its literal sense as a quality, — mere want of activity, or laziness.

"Even to this day, those who are not practically familiar with the free motion of large masses, though they all admit the truth of dynamical principles, yet feel little repugnance in accepting the theory known as Boscovich's, — that substances are composed of a system of points, which are mere centres of force, attracting or repelling each other. It is probable that many qualities of bodies might be explained on this supposition; but no arrangement of centres of force, however complicated, could account for the fact that a body requires a certain force to produce in it a certain change of motion, which fact we express by saying that the body has a certain measurable mass. No part of this mass can be due to the existence of the supposed centres of force.

"I therefore recommend to the student that he should impress his mind with the idea of mass by a few experiments, such as setting in motion a grindstone, or a well-balanced wheel, and then endeavoring to stop it; twirling a long pole, etc., till he comes to associate a set of acts and sensations with scientific doctrines of dynamics, and he will never afterwards be in any danger of loose ideas on these subjects. He should also read Faraday's essay on 'mental inertia,' which will impress him with the proper metaphorical use of the phrase to express, not laziness, but habitude" (Maxwell's Theory of heat, pp. 85, 86).

It will be observed that Maxwell, instead of calling a certain property of matter *inertia*, and defining it