

the shocks extended to the region of the Trondhjems fjord, the Swedish border, and the Christiania fjord, and Bergen, but the extreme south-west part of the country seems to have been undisturbed. The earthquake is also reported from Fünen, in Denmark. The movement proceeded in about seven minutes from the west coast to Christiania (at Christianund 11h. 38m. Christiania time, 11h. 15m. Greenwich time) It is interesting to notice that the earthquake resembles one which occurred on March 9, 1866, and was felt across the North Sea at the lighthouse of Flugårrock, on the Shetland Islands. As I am engaged in collecting data about the earthquake of this month, I should be glad to know whether it was observed in the British Isles.

Christiania, February 11.

HANS REUSCH.

"The Black-veined White Butterfly."

My experience of this species in England enables me to support Mr. W. Warde Fowler's opinion (*NATURE*, February 14, p. 367) as to the preference of the species for open ground. I met with it in abundance in the New Forest in 1866, 1868, 1869, and 1870. It rarely occurred in or near dense woods, but preferred the open heaths and wastes of the Forest, where thistles were plentiful. In 1867 I found the species swarming, about mid-summer, in hay fields on hillsides in Monmouthshire. There were a few small orchards, but not much wood, in the neighbourhood. For a detailed account of the former distribution of *Aporia crataegi* in this country, I would refer Mr. Warde Fowler to my article on the subject in the *Entomologists' Monthly Magazine* for March 1887.

H. GOSS.

Surbiton Hill, March 16.

The Zodiacal Light.

At the present moment—7 p.m. February 16—the zodiacal light is more distinct than I ever remember to have seen it in England. The middle of the base is about 2° to the northward of the point where the sun set, and the axis is directed towards the Pleiades, and can be traced as far as the middle of Aries. The afternoon has been remarkably clear, and it is now a brilliant starlight evening.

J. P. MACLEAR.

Cranleigh, Surrey, February 16.

OYSTERS AND TYPHOID.

THE statements that have recently appeared, both in the general and in the medical press, concerning the communication of typhoid fever through the agency of oysters when eaten raw, make it desirable to review some of the data on which the suspicion in question is based. For many years past it has been a matter of assumption, when typhoid fever has followed, within some ten to fifteen days, on the consumption of raw oysters, and when no obvious cause for the disease could be detected, that the oysters stood to the fever in the relation of cause; and this attitude received no inconsiderable impetus when, a few years ago, a member of our Royal family sickened of typhoid fever under circumstances that were suggestive of oysters as the vehicle of the disease. Then again, it must be admitted that it has been a matter of no very uncommon experience amongst medical men to have to treat typhoid fever in patients who, at an antecedent date corresponding with the incubation period of typhoid fever, had indulged in an oyster supper after leaving some place of entertainment. And the suspicion has been confirmed, in some cases, when it has been ascertained that another member of the same party, having nothing but the oyster supper, in common with the sufferer referred to, has also had typhoid fever about the same date, or had suffered from vomiting and other symptoms the day after the consumption of the oysters. The assumption in cases of this latter class has been, that the specific poison of typhoid fever was, with other matter that had become objectionable to the system, got rid of by the attack of sickness. A case generally illustrative of this class of occurrence was recently recorded in the *British Medical*

Journal. Four friends had an oyster supper on November 5. Two of them lived not far apart, but the others had nothing in common as regards residence or anything else. On November 23 three of them sickened, and they were, later on, all found to have typhoid fever. One of the patients, during convalescence, disclosed both his profession and his views by re-naming his malady "bivalvular disease."

Amongst leading medical men who have adopted the view that oysters are a source of typhoid fever, we may name Sir William Broadbent, who early this year announced that from time to time he had seen cases of typhoid fever "apparently attributable to oysters," but that during the course of last autumn the evidence as to the communication of the infection through this agency has been of such a character as to produce "conviction" in his mind.

This naturally leads us to ask how the oyster becomes the vehicle of such a disease; and the evidence already forthcoming on this point is such that we could only wonder if typhoid fever were not occasionally conveyed to those who eat this favourite mollusc in an uncooked form. Investigation of some of the river estuaries and other places where oysters are cultivated and prepared for market would almost lead us to believe that conditions favourable to typhoid fever were deliberately chosen for the purpose. Indeed, it is notorious that a number of our British oyster-beds are in such relation to sewer outfalls, that the oysters must of necessity be bathed in a solution of sea-water and sewage at every tide. According to a commissioner appointed to inquire into this matter by the *British Medical Journal*, a well-known Essex oyster fishery has "a sewer discharging between oyster-beds on either side"; and at a "health-resort" (!) on the same coast, it is a common practice to moor the oyster-boxes to a pier or groyne, within a few feet of which the evidences of sewage are too palpable to be specified. In both the places referred to, the typhoid fever poison, which it is known finds access to drains, had had ample chance of fouling the sewers in question.

It has been alleged, on the evidence of certain recent bacteriological investigations as regards the contents of London sewers, that the organism producing typhoid fever cannot live and multiply in sewers. But the organism has been found in sewers; it also lives in sea-water; and the fact remains that sewage bathes our oysters during cultivation to an extent that is essentially disagreeable, and that ought not to take place; and, also, that typhoid fever follows the use of oysters so cultivated. It may also be alleged, as is done by certain oyster-growers, that sewage is fatal to the oyster itself. In answer to this, we can only say that such evidence as we have obtained, as to some of our oyster-beds, is absolutely opposed to this statement; and not only so, but we know of more than one instance where the oysters are deliberately brought from the beds to fatten in still nearer proximity to outfall sewers for a week or more preliminary to their sale. In brief, if sewage and noxious micro-organisms can be retained in the beard and other portions of the oyster, or in the "juice," which is so much relished, everything seems contrived to secure such retention of filth at some of our oyster fisheries.

Doubtless the same applies to many foreign oyster-beds. Indeed, the recent experience embodied in a report by Prof. W. N. Conn, as to an epidemic of typhoid fever amongst the students of a college at Middletown, Connecticut, not only supplies convincing evidence of this, but it affords the most connected and complete proof of "oyster-typhoid" as yet published. Quite an epidemic of typhoid fever occurred amongst the students of certain fraternities, and amongst a number of their friends who had joined them at their "initiation suppers," but who had subsequently returned to their distant

homes, where they sickened. The incidence of the epidemic was on those fraternities only who had included raw oysters in their *menu*; and even amongst these some marked escapes were in persons who, for one and another reason, had not consumed oysters. The suspected oysters came from Long Island Sound, where they had been put to "fatten" in a fresh-water estuary within 400 feet of a sewer known to have been receiving typhoid material. The last piece of evidence bearing upon this subject comes from an official source. It is announced that, on the strength of a report by the Medical Officer of the Local Government Board, as to the diffusion of cholera in England during 1893, which report is now passing through the press, an inquiry has been commenced into the circumstances under which oysters are cultivated and stored round our coasts. The reference is clearly to the serious outbreak of cholera at Grimsby and Cleethorpes, and to the diffusion of the epidemic from those places, whence a large distribution of oysters and other shellfish is constantly in progress.

Whatever be the outcome of the inquiry which has been instituted, it is certain that two questions will come to the fore: (1) the need for control over our oyster-beds, and (2) the desirability or not of allowing crude sewage to be discharged direct into the sea, or into tidal estuaries.

NOTES.

SIR HENRY ROSCOE has been made Chairman of the Select Committee of the House of Commons appointed to enquire whether any, and what, changes in the present system of weights and measures should be adopted.

WE regret to announce that Mr. John Whitaker Hulke, F.R.S., president of the Royal College of Surgeons of England, died on Tuesday, from broncho-pneumonia. An obituary notice in the *Times* furnishes us with the following particulars with regard to his career. Mr. Hulke was born in 1830, and was the elder son of a well-known and highly-esteemed surgeon at Deal, where his family had been settled for several generations. He was educated at King's College School, and subsequently spent two years in Germany, where he thoroughly acquired the language. After a varied experience as surgeon to the hospital at Smyrna, during the Crimean War, and in King's College Hospital, he migrated to Middlesex Hospital. In 1859 he received the Jacksonian prize of the Royal College of Surgeons for his Essay on Diseases of the Retina, and soon afterwards he brought out a treatise on the ophthalmoscope, then a novelty in eye-practice. This led to his being regarded mainly as an ophthalmic surgeon; but he contributed to general surgery in the *Medico-Chirurgical Transactions*, and joined Mr. Holmes in editing the third edition of his "System of Surgery." He was elected a fellow of the Royal Society in 1867. In 1876 he was appointed an examiner in anatomy and physiology at the College of Surgeons; and in 1880 became a member of the Court of Examiners, an office which he held for ten years. In 1881 he was elected a member of the Council; and, after twice serving the office of vice-president, he became president in 1893, and has died in office. He had been president of the Pathological and Ophthalmological Societies, and at the time of his death was president of the Clinical Society and librarian of the Royal Medical and Chirurgical Society. Mr. Hulke was, however, much more than an accomplished surgeon. He was a good comparative anatomist, botanist, and geologist; and was at one time president of the Geological Society of which he was elected the Treasurer on February 15. He was an artist in water colour, and was able both to model in clay and to carve in marble. His loss is a real one to the medical profession, in which he was esteemed as a man of the highest probity and sagacity.

WE notice the death, at the age of eighty-eight, of a gifted mathematician, the Rev. T. P. Kirkman. He was elected a Fellow of the Royal Society in 1857.

THE following deaths have occurred among scientific men abroad:—Dr. Gerhard Kriess, Extraordinary Professor of Chemistry in the University of Munich. M. Jules Regnaud, Professor of the Paris Faculty of Medicine, at the advanced age of ninety. The Rev. J. Owen Dorsey, a well-known ethnologist, at Washington, February 5. Prof. Dorsey had been connected with the Bureau of Ethnology, since 1877. He was the president of the Anthropological Section of the American Association for the Advancement of Science in 1893. We also have to record the death, at the early age of forty-five, on January 28, of Dr. F. Schmitz, Professor of Botany at Greifswald. For many years past, Dr. Schmitz had turned his attention chiefly to the study of the Algæ, and especially of the red sea-weeds or Floridææ, to our knowledge of the life-history of which he had made substantial additions. He published, in the year 1877, an account of the formation of auxospores in the diatoms, and, in 1879, a description of the green Algæ of the Gulf of Athens.

PROF. L. GUIGNARD, President of the Botanical Society of France, has been elected to succeed the late Prof. Duchartre in the Section de Botanique of the Paris Academy of Sciences.

LORD RAYLEIGH will deliver a course of six experimental lectures on "Waves and Vibrations," at the Royal Institution, on Saturdays, March 2, 9, 16, 23, 30, and April 6. He will also deliver the Friday evening discourse on April 5, when his subject will be "Argon, the New Constituent of the Atmosphere."

A NEW thallium mineral has just been described, under the name of Lorandite, by Prof. Krenner, of Buda-Pesth. The new mineral occurs sparingly, in association with realgar, at Allchar in Macedonia. It is found as transparent crystals belonging to the Monosymmetric system, and having the form of plates or short prisms; its colour varies from cochineal-red to kermesitised. The mineral proves on analysis to correspond to the formula $TlAsS_2$, and contains 59.5 per cent. of thallium.

WE have received from the Russian Chemical Society a pamphlet devoted to the description of the new chemical laboratory which has been erected at the St. Petersburg University. The laboratory has been built in accordance with the requirements of modern scientific investigation, and has cost £32,720. All branches of research have separate large halls, special rooms being allotted to physical chemistry and accurate physical measurements. Although the laboratory is behind many of the largest laboratories of West Europe, it has the advantages of perfect arrangements for each separate worker, and it decidedly has no rivals for the perfection of ventilation. The total amount of warm air supplied to all the halls of the building attains 823,000 cubic feet per hour, so that the air will be totally changed from one to five times per hour in each separate hall.

THE Russian Geographical Society awarded, at its meeting of January 30, the Constantine medal to S. N. Nikitin for his numerous works on the geology of Russia; the Count Lütke medal to P. K. Zalesskiy for geodetical work in Turkestan; the great gold medal, to N. A. Karysheff for his work, "The Land rented by the Peasants"; and the Prjevalsky premium, of £60, to V. A. Obrucheff for his last journey in Turkestan and Central Asia. Small gold medals were awarded to the French geodesist, M. Defforges, and the Austrian geodesist, Baron Sternneck, for their pendulum observations in Russia, and to M. Sieroszewski for his MS. on the Yakutes; and the great silver medal of Prjevalsky's name to Baron Toll and Lieutenant Shileiko, for their last journey to Arctic Siberia. Eleven silver medals were also awarded for minor works.