logical institute of Vienna, on Nov. 3, a lecture on the means of preventing explosions in coal-mines. Experiments have been made in the Karwin colliery in order to obtain, if possible, positive results, and these experiments are still being continued. It has been demonstrated that whenever the barometer falls, the quality and intensity of explosive gases increase. The Austrian government has directed that the weather-charts published shall be provided by all the managers of coal-mines in that kingdom, and at Karwin a regulation is in force to the effect that at the approach of a barometric depression all work is to cease in dangerous places.

— The 'Report on the geology of Marion county, Kentucky,' recently published, is in many respects a curiosity. The history, topography, and drainage, treated of in five pages, is followed by the geology in fourteen pages, archeology in five pages, and a list of fossils and notes on Beatricea in eleven pages. The following selection will illustrate the style of the report: "The soil from the disintegration of the Crab orchard shale is quite poor, and responds very slowly to the toils of the farmer; while the forest growth is very much dwarfed, although similar in species to that of the tall, well-shaped, large-sized timber-trees of the epoch before it. The forests originally were well timbered" (p. 17). This last sentence is particularly remarkable.

— Most of the rivers of New South Wales fall into the sea through sandy estuaries obstructed by extensive bars. The removal of these bars, or rather the formation of practicable channels through them, is of great importance to the development and trade of the colony. A paper on this subject was read before the Royal society of New South Wales in June, 1884, by Mr. Walter Shellsbear. The formation of bars at the mouths of rivers is stated by the author to be mainly due to the action of waves in lifting large quantities of sand as they pass into shallow water. The sand is carried up the estuary by the incoming tide, and deposited when beyond the action of the waves. The ebb-tide, being unassisted by the waves, is unable to remove the sand, and hence the tendency is to close the entrance. While strong freshets may for a time sweep a portion of the obstruction away, the frequent occurrence of long droughts in New South Wales leaves the river-mouths in a very bad state. The author advocates the use of break-waters, jetties, and training dikes, more or less parallel, and running out into deep water, three and a half fathoms or more, — a depth beyond which the waves are stated to have no appreciable effect on the bottom.

LONDON LETTER.

ONE of the matters which grew out of the education conference at the International health exhibition in London in August, 1885, some account of which appeared in the columns of *Science*, was the proposal for the establishment of a teaching university for London. The present University of London is mainly an examining board. In the case of its medical degrees, attendance upon specified courses of instruction in one or other of the medical schools recognized by the university is compulsory. The degrees in arts, science, etc., may be obtained by any persons, of either sex, who can satisfy the examiners as to their attainments, no matter whether that knowledge has been acquired by private study, private tuition, or college attendance. In point of mere attainment, the London degrees rank higher than the corresponding degrees of any other university; but they do not imply, as those of Oxford, Cambridge, etc., do, that their holder has been taught in colleges by men of university rank and standing, and according to university methods. The scheme of examinations laid down by the senate of the University of London naturally exercises a very wide influence upon the subjects taught in schools and colleges all over England; since more than two thousand candidates annually enter for the matriculation, or entrance examination, of the university. As there is no official connection between the senate and examiners on the one hand, and the principal professors and teachers on the other, the latter (some of whom are men of the greatest eminence and of world-wide fame) naturally feel aggrieved at the dominant influence which the university exercises over their courses of instruction, since they are practically compelled to teach those subjects prescribed for examination, and almost those alone. Moreover, there is a growing feeling that the enormously wealthy guilds and companies of the ancient city of London will be shortly compelled, either by actual legislation or by the potent force of public opinion, to appropriate more of their funds than they at present do, to educational purposes. These were the two main ideas which led to the formation of the Association for the promotion of a teaching university for London. On this body are representatives of all the principal educational institutions of London, in the four great faculties of arts, science, laws, and medicine. Large bodies take time to move, and, where there is much diversity of opinion, it is very difficult to formulate a scheme which shall meet with the acceptance even of a bare majority. This desirable stage has not yet been attained. The members of the existing university of London, however, naturally had to con-

sider what should be their attitude towards the new body. Accordingly, at a very full meeting of convocation (as the general body of graduates above a certain standing is termed) last summer, the whole subject was referred to a special committee of forty (of which the present writer was a member), to consider and report. This committee appointed Lord Justice Fry its chairman, and a scheme was by it prepared for the re-organization of the existing university from the points of view of the new association, — a task the more easy, as several gentlemen were members of both bodies. At an adjourned meeting of 'convocation' held on Dec. 8, this scheme was rejected, and, as the former committee refused to act, another committee of twenty-five was appointed to modify it in the sense indicated by convocation.

The year which is now drawing to a close has been marked by greater losses to English biology than any since 1882, which witnessed the deaths of Mr. Darwin, Prof. Francis Balfour, and Sir Wyville Thomson. Prof. Morrison Watson was a well-known anatomist of hardly more than middle age; while Drs. W. B. Carpenter, J. Gwyn Jeffreys, and T. Davidson were almost the last of that older school of zoölogists who are too often looked down upon by the younger generation which has been trained to minute histological work. Dr. Davidson had the happiness of completing the work to which he had devoted the labors of a long life; but his two old friends have left much material behind them, the working-out of which must be completed by other hands. Dr. Carpenter's loss will be severely felt by those who believe in the organic nature of eozoon. He had accumulated a very great amount of material, which was regarded by all to whom he had shown it as proving his case in the most satisfactory manner possible.

An important reform has just been carried out at Oxford. Honor candidates in law, history, and science, will henceforth be excused from the classical examination at the end of their first, or the beginning of their second, year, which is known as 'moderations.' The preliminary examination 'responsions' can be passed before residence begins, either in the leaving examination of a public school or at the university itself; and men can therefore specialize during the whole of their university course, instead of having their attention distracted from physics, chemistry, or biology by the necessity of getting through 'mods.' This has long been the case at Cambridge, and is one of the reasons for the overflowing state of its medical school.

The old public schools are also beginning formally to recognize that there are other branches of education besides the classics. Rugby is about to institute a modern side; and changes in the same direction are being gradually introduced at Eton, her great rival, Harrow having long had something of the kind. The committee of the city and guilds of London institute for the advancement of technical education have offered free studentships of the annual value of thirty pounds, tenable for three years at the central institution, to be awarded by the head master of each of the principal public schools. It will be a matter of some interest to see what proportion of boys will avail themselves of these opportunities for obtaining the higher technical education.

W.

London, Dec. 17.

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.*

The moon's atmosphere.

MY friend, Professor Langley of Allegheny, has recommended to me to give you an account of a phenomenon twice observed by me on the occasion of two occultations of Jupiter. At the moment of contact, the planet, instead of passing behind the moon, appeared to be projected upon the moon's edge, until nearly or quite one-half of the disk of the planet was visible on the moon's surface. Then suddenly the whole planet disappeared behind the moon. As this phenomenon must be due to refraction, it would indicate a lunar atmosphere. The instrument with which I observed the occultation was a telescope made for me by Alvan Clark, with a four-and-a-half inch aperture. JAMES FREEMAN CLARKE.

Jamaica Plain, Mass., Dec. 31.

Demand for good maps.

Your comments in the number for Dec. 18, on the character of our small maps, are to me very welcome, and I hope you will follow the subject up till some decided impression is made on the minds of the publishers. The maps in our school geographies are, to me as a teacher, a constant source of vexation. Indistinct, incomplete, inaccurate, they baffle attempts at close work, and so compel, if solely depended upon, a very elementary grade of work. The small *schul-atlas* that a German boy buys for twenty-five cents is worth ten times as much as our best geography maps.

You spoke of old plates. I have seen within two years a wall-map of North America in which the Yukon River had not been drawn. Said map was shown as a sample in the office of one of our largest publishing-houses.

When the German publishers bring out their work so perfect, it seems as if the material was provided for American geography-makers. Is the reason they do not use it because, with German lettering, the maps cannot be reproduced by the photographic process and be available? Or are they afraid of repeating the mistake of one of our atlas-makers, who produced a town in Africa called Elfenbein?

However it may be, we do need better school-maps.