confusion; and in the second, although all parallel planes have the same slope, any number of other planes not parallel can also have it; the word is therefore not sufficiently definite. "Tilt," a word spoken of by Mr. Proctor, as though it had been suggested, has no geometrical meaning whatever. As a substantive it is a "tent," or "awning;" it has also been sometimes used poetically as an equivalent to "tournament," and is, I believe, the familiar abbreviation of "tilt-hammer." These are its only meanings, and none of them apply to a plane.

I would only add that I do not quite see what the fact mentioned by Mr. Proctor, that he has written twelve books in the last six years—interesting as it may be from a bibliographical point of view—has to do with the matter.

Oct. 29 J. K. LAUGHTON

THREE elements are necessary to fix the position of a plane as I understand the word "position." If "aspect" and "slope" be the names of two of these, the third will be the perpendicular upon the plane from some fixed point. It is because the term "position" implies the fixedness of this third element that it is inappropriate to express my friend Mr. Wilson's meaning.

My friend Mr. Proctor will pardon me if I do not consider the question entirely settled by the fact that he has written perspicuously and explained clearly by the use of a term which fixes too much. With an improved scientific terminology, he will be able to make his next twelve books superior (if that be possible) to those he has written within the last six years.

"Aspect" and "slope" stand on the same footing, one connotes a reference to the points of the compass, the other to the horizon. Neither can be used in Mr. Wilson's sense without departing from their colloquial meaning, but it is perfectly competent for geometers to take a word from common conversation and give it a scientific meaning. Either of these words may be used in Mr. Wilson's test sentences. Parallel planes have the same slope, two slopes determine a direction, &c.

It is yet possible that some correspondent can suggest a better term, either one imported from ordinary life or one conceived for the purpose.

THE CORRESPONDENT WHO SUGGESTED "SLOPE"

Geometry at the Universities

PROF. THISELTON DYER has well pointed out a distinction which exists between the mathematical courses at Oxford and Cambridge. But his conclusion, that at Oxford "special attention to geometrical methods would pay very well," though acceptable in its way, falls far short of what I advocate. The great want at both Universities is a course of geometrical studies; and the proof that such a want exists is to be found in the fact that the geometrical treatises in use at either University, cover so very limited a range. There are not even any text-books on the geometry of the sphere, cone, cylinder, and like simple solids, or on such curves as the lemniscate, cycloid, and the simpler spirals. A few stray notes on these subjects may be found in some of the text-books, but not a thorough and systematic geometrical investigation of any of them. Geometrical treatises might with advantage range much further. A geometrical treatise on ellipsoids would be of immense use apart from its employment as a means of mental training. Geometrical treatises on paraboloids of both kinds, on hyperboloids of one sheet and of two sheets, on the various orders of ring-surfaces and screw-surfaces, and on many other tridimensional matters, would afford invaluable exercise to the student, besides having a real value to the scientific worker. I venture to express my conviction, that a course of such studies would tend to develop mathematical powers much more thoroughly even than the study of covariants and contravariants, Jacobians, Hessians, *et hoc genus omne.*

If there is one department of mathematical research in which our countrymen are fitted by their mental habitudes to distinguish themselves pre-eminently, it is precisely this neglected department of geometrical research. As it is, though we have geometricians of great power, no systematic geometrical work is done in England. Our treatises range only over the most elementary geometrical subjects, and even in discussing these subjects our writers are fain to accept the assistance of Continental geometricians. One would conceive that each of our Universities might yearly send out many who could treat of the elements of geometry without keeping a hand always on some French or German text-book.

Brighton, Oct. 27 RICHD. A. PROCTOR

DEEP-SEA DREDGING IN THE GULF OF ST. LAWRENCE

THE marine zoology of the deeper parts of the River and Gulf of the St. Lawrence has not been investigated until quite recently. This summer, under the auspices of the Natural History Society of Montreal, and in consequence of the kindness of the Hon. Peter Mitchell, Minister of Marine and Fisheries for the Dominion (who not only gave me facilities for dredging on board Government vessels, but also caused sufficient rope to be provided for the purpose), depths of from 50 to 250 fathoms were successfully examined. The greatest depth in the Gulf, to the west of the Island of Newfoundland, as given in the Admiralty charts, is 313 fathoms. It is thought that a general sketch of the results obtained may be of interest to the readers of NATURE.

The cruise lasted five weeks, the first three of which were spent on board the Government schooner *La Canadienne*, and the remaining two on the *Stella Maris*. The area examined includes an entire circuit round the Island of Anticosti, and extends from Point des Monts (on the north shore of the St. Lawrence) to a spot about half way between the east end of Anticosti and the Bird Rocks. As these investigations were almost necessarily subordinate to the special duties on which the schooners were engaged, in several cases the same ground was gone over twice.

The bottom at great depths generally consists of a tough clayey mud, the surface of which is occasionally dotted with large stones. So far as I could judge, using an ordinary thermometer, the average temperature of this mud was about 37° to 38° Fahrenheit, at least on the north shore. In the deepest parts of the river, on the south shore, between Anticosti and part of the Gaspe Peninsula, the thermometer registered a few degrees higher. Sand dredged on the north shore in 25 fathoms also made the mercury sink to 37° or 38°.

Many interesting Foraminifera and Sponges were obtained, but as yet only a few of these have been examined with any care. A number of Pennatulæ were dredged south of Anticosti; the genus has not been previously recorded, so far as I am aware, as inhabiting the Atlantic coast of America. They were found in mud, at depths of 160 and 200 fathoms, and it seems probable that this species, at least, is sedentary, and that it lives with a portion of the base of the stem rooted in the soft mud. *Actinia dianthus* and *Tealia crassicornis* were frequent in 200 to 250 fathoms. The Echinoderms characteristic of the greater depths are a *Spatangus* (specifically distinct from the common British species), *Ctenodiscus crispatus*, *Ophioglypha Sarsii* (very large), *Ophiacantha spinulosa*, and *Amphiura Holbollii*. Marine worms, of many genera and species, were both numerous and fine. Among the more interesting of the Crustacea were *Nymphon grossipes* (?) and a species of *Pycnogonum*. Several of the last named Crustaceans were taken at a depth of 250 fathoms, entangled on a swab, fastened in front of a deep-sea lead, which was attached to the rope, a few feet from the mouth of the dredge. This circumstance tends to show that the genus is not always parasitic in its habits. The Decapods, Amphipods, &c., at least those of greatest interest, have not yet been identified. Among the most noticeable of the marine Polyzoa are *Defrancia truncata*, and what appears to be a *Retepora*. Not many species in this group were obtained in very deep water, and those procured were, for the most part, of small size. About six species of Tunicates were collected. Being anxious to have Mr. J. Gwyn Jeffreys' opinion upon the various species of Mollusca during his visit to Montreal, I studied these carefully first, and submitted the whole of them to him for examination. Twenty-four species of Testaceous Mollusca were obtained at depths of from 90 to 250 fathoms. Nearly all of these are Arctic forms, and eleven of them are new to the continent of America.

The following are some of the most interesting of

the deep-water Lamellibranchiata:—*Pecta grœnlandicus* of Chemnitz, but not of Sowerby;* *Arca pectunculoides* Scacchi; *Yoldia lucida* Loven; *Y. frigida** Torell; *Neœra arctica** Sars; *N. obesa** Loven. Among the novelties in the Gasteropoda of the same zone are the subjoined:—*Dentalium abyssorum* Sars; *Siphonodentalium vitreum* Sars; *Eulima stenostoma* Jeffreys; *Bela Trevelyana;* *Chrysodomus (Sipho) Sarsii.** Three Brachiopods occur in the Gulf, of which *Rhynchonella psithacea* and *Terebratella Spitzbergensis* are found in about 20—50 fathoms, and *Terebratula septentrionalis* in from 100—250. A few rare shells were obtained in comparatively shallow water; among them an undescribed *Tellina* (of the section *Macoma*), a new *Odostomia*, and *Chrysodomus (Siphho) Spitzbergensis** Reeve. Nor were even the Vertebrata unrepresented; from a depth of 96 fathoms off Trinity Bay, a young living example of the Norway "Haddock" (*Sebastes Norvegicus*) was brought up in the dredge. And off Charleton Point, Anticosti, in 112 fathoms, on a stony bottom, two small fishes were also taken; one, a juvenile wolf-fish (*Anarrhicas lupus*) the other a small gurnard, a species of *Agonus*, probably *A. hexagonus* Schneid.

The similarity of the deep-sea fauna of the St. Lawrence to that of the quaternary deposits of Norway, as described by the late Dr. Sars, is somewhat noticeable. *Pennatulæ*, *Ophiura Sarsii*, *Ctenodiscus crispatus*, several Mollusca, &c., are common to both; but on the other hand, the absence of so many characteristic European invertebrates on the American side of the Atlantic should be taken into consideration. The resemblance between the recent fauna of the deeper parts of the St. Lawrence, and that of the Post-pliocene deposits of Canada, does not seem very close, but our knowledge of each is so limited that any generalisations would be premature.

J. F. WHITEAVES

* I am indebted to Mr. Jeffreys for the identification of species to which an asterisk is attached. He corroborates also my determination of the remainder.

THE REDE LECTURE AT CAMBRIDGE

ONE of the indirect results of university reform has been the establishing at Cambridge of the Rede Lecture, one of the highest intellectual treats of the whole year, as will at once be acknowledged when the names of the distinguished persons who have delivered it since its establishment in 1858 are known—viz., Professors Owen, Phillips, Max Müller, Willis, Ansted, Airy, Tyndall, Miller, Ruskin, Huggins, General Sabine, Sir W. Thomson, and Mr. Norman Lockyer. For many years past there had been certain lecturers at various colleges, whose duty it was to deliver lectures on mathematics, philosophy, rhetoric, and logic; but in 1858 the endowments for these lectures (originally given in 1524 by Sir Robert Rede, Chief Justice of the Common Pleas in the reign of Henry VII.) were amalgamated, and the result has been the delivery once a year of the Rede Lecture by some distinguished man of science chosen by the Vice-Chancellor for the time being. Such is the history of the benefaction; but it must now be added that as the remains of this distinguished man lie in a village church in Kent, that of Chiddingstone, near Eden Bridge, in which parish he lived and died, without a memorial or inscription of any kind over his grave, it is proposed to do for him what Cicero did for the unhonoured grave of Archimedes, and an effort is, therefore, being made to mark his place of burial by erecting a window of stained glass in the chancel that he built. The cost of the memorial, with suitable inscription, cannot be less than 160*l.*, but nearly 70*l.* has been raised by subscriptions from the distinguished persons who have delivered the lecture, and by other friends, members of the university and otherwise—viz., the Earls of Powis, Derby, and Strathmore, the Vice-Chancellor, the Masters of Jesus and Clare Colleges, the Provost of King's, Professors Selwyn and Sedgwick, Mr. Beresford-Hope, M.P., Sir John Lubbock, M.P., the Public Librarian, Rev. W. H. Latham, and J. Brocklebank, with many others; but the amount thus subscribed, together with the local effort, is inadequate for the full completion of the memorial, and it is hoped that there will be some others who will be willing to help on the work. Mr. Norman Lockyer, F.R.S., the present holder of the office of Rede Lecturer, has kindly consented to receive subscriptions at 6, Old Palace Yard, Westminster.

It is proposed to erect the following inscription, from the pen of Professor Selwyn, who will receive any subscription forwarded to him at Cambridge.

IN PIAM MEMORIAM
ROBERTI REDE MILITIS
CAPITALIS JVSTICIARII
DOMINI REGIS HENRICI VII.
DE COMMVNI BANCO
QVI HOC SACELLVM
ÆDIFICAVIT
GRATI AC MEMORES
BENEFICIORVM
CANTABRIGIENSES SVI
HANC FENESTRAM
PONI CURAVERVNT

THE CONJOINT EXAMINATION SCHEME*

THE proposition carried at the last meeting of the Council of the College of Surgeons clears away, we suppose, the last difficulty in the way of an amalgamation between the Colleges of Physicians and Surgeons for the purposes of examination and of issuing diplomas. It is remarkable that the College of Surgeons should have come back to the original proposal, though it was at first demurred to and given to a committee for consideration. The College of Physicians, at its Comitia on Thursday, finally agreed to this proposal; and it now only remains for the General Medical Council to give its consent under the Medical Act of 1858, so as to allow of the fusion in question.

In order to get at the practical working of the proposed scheme of division of fees, we may take the present income of the College of Surgeons from the membership diploma, adding 10*l.* for each diploma issued to represent the additional fee to include the College of Physicians. The sum produced by the membership diploma during the last financial year was close upon 8,000*l.*; and if we add 10*l.* for each of the 291 diplomas issued, we have in round numbers the sum of 11,000*l.* The proposed scheme is, that one-half of this should be devoted to all the expenses of the examinations, and that the remaining moiety of 55,000*l.* should be divided into thirds. One-third is to go to the support of the Museum of the College of Surgeons and its unendowed professorships, one-third for the maintenance of the *personnel* of the College of Physicians, and one-third similarly to that of the College of Surgeons. This will give the Hunterian Museum and each of the Colleges some 1,800*l.* a year apiece, irrespective of other sources of income. With this income, it will, we imagine, be perfectly possible to carry on satisfactorily the establishments in Pall Mall and Lincoln's Inn Fields, if due economy be observed and proper supervision exercised over the subordinate officials. The Hunterian Museum will be upon a somewhat shorter allowance than heretofore; but if this prove insufficient, Parliament must be appealed to for a grant in favour of what the Council of the College of Surgeons properly characterises as an "institution of national as well as professional importance."

* Reprinted from *The Lancet*.