was tested in regard to its porosity, and this was found to be considerable—a remarkable result, having in view the conditions under which it had been formed.

Another point of interest was that where the soft graphite had been driven into the Acheson graphite plug at the bottom of the apparatus it became extremely hard, so much so that a hard steel file made little or no impression upon it.

The main difference in treatment of this part of the graphite as compared with the remainder is that it was cooled much more quickly, thanks to the high heat conductivity of the Acheson graphite plug. The cause of hardening has hitherto not met with any satisfactory explanation.

No appreciable quantity of carbide of magnesia was formed in the experiments. The magnesia close to the graphite core contained traces of carbides, but as there were always traces of iron left from the drilling-out process, this may be plausibly accounted for by the formation of carbide of iron.

The graphite was finally systematically searched for microscopic diamonds by Staudenmaier's modification of Brodie's method of conversion of graphite into graphitic acid,[1] or else by Moissan's modification of the same method.[2] A convenient means of distinguishing diamond in fine powder from most or all of the substances which are not separated by a liquid of density 3·34 at 4° C. is to heat the powder in a silver spoon to a dull red heat in fused potassium hydroxide. Check experiments showed that diamond dust easily passing a sieve with 100 threads to the inch would withstand the action of molten caustic potash at a temperature at which the edges of the silver spoon began to melt for five or ten minutes. Crystals of alumina or of carborundum are entirely destroyed by this fusion, but the diamond particles seemed to have undergone no change. In fact, the individual fragments could be recognised under the microscope after passing through the ordeal.

I am led to consider that my experiments indicate that no wholesale transformation of amorphous carbon or graphite into diamond can be brought about by temperatures of the order of 2000° C. and pressures of more than 50 and less than 100 tons per square inch. There is some uncertainty, as already mentioned, in regard to the actual pressures operative during the trials. Prof. Tammann has, however, obligingly directed my attention to the fact that the equilibrium curve graphite-diamond may nevertheless have been crossed, but that no diamond was formed because time for crystallisation was not allowed under the conditions of the experiment. I confess my idea in making the trials was that the amorphous carbon or graphite might be forced to melt, and then that the conditions would require it to re-crystallise as diamond—not, of course, in the form of large clear crystals, but rather in the form of bort or black diamond.

The experiments described have only been rendered possible by the invention of high-speed steel, which keeps its hardness up to nearly, or quite, a red heat, and any further advance—mainly in the direction of the allowance of more time—must wait for improvements in that material. It may very well be, however, that the limits of temperature within which crystallisation in diamond form can take place are really very narrow at any pressure; and in this case it will be a matter of very great difficulty to make an apparatus in which the conditions could be kept constant for a sufficient length of time, and the difficulty would be greater the higher the temperature.

It is noteworthy from this point of view that in Moissan's artificial production of diamond very much lower pressures and temperatures were used than those just described. I have shown[3] that, using iron as a solvent, it is highly improbable that Moissan attained a pressure of more than 20 tons/sq. inch, and when silver was employed the pressure must have been much lower. A similar criticism places the effective temperature of formation of diamond in iron or silver spheroids at something of the order of 1500° C. Comparing the experiments of Moissan with those described above, it looks as if Roozeboom's opinion is at present the most probable, viz. that solvents are necessary in order to depress the crystallisation point of diamond to a temperature at which the transformation to graphite is slow enough for rapid cooling to interrupt it. In this case the next step would be to repeat the experiments I have described at the highest possible pressure in the presence of iron, though Mr. Parsons[1] has already made some trials in this direction with negative results. We have, however, many metals which have never been tried in this connection, and one or other of them may turn out to have the requisite properties.

[1] Ber., 1898, xxxi., 1485. [2] Electric Furnace, 49, translation.
[3] Journ. Chem. Soc., xciii., 1908, 1351.

[1] Loc. cit

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The board of anthropological studies has elected Mr. A. R. Brown, fellow of Trinity College, to the Anthony Wilkin studentship in ethnology and archæology. The John Winbolt prize has been awarded to Mr. E. T. Busk, of King's College.

A university lectureship in zoology, recently held by Prof. Gardiner, is now vacant. The general board of studies will shortly proceed to appoint a lecturer to hold office from January 1, 1910, until September 30, 1914. The annual stipend is 50*l*. Candidates are requested to send their applications, with testimonials if they think fit, to the Vice-Chancellor on or before Saturday, November 27.

The Vice-Chancellor gives notice, on behalf of the board of geographical studies, that the Rev. T. G. Bonney, F.R.S., has consented to deliver a lecture in Cambridge on Thursday, November 25, at 5 p.m., on "A Desert Phase in the Development of Britain." By permission of Prof. Hughes the lecture, which will be illustrated by lantern-slides, will be given in the large lecture-room of the Sedgwick Museum of Geology.

The professor of botany also gives notice that Dr. H. H. W. Pearson, of Gonville and Caius College (professor of botany in the South African College, Cape Town), has consented to deliver a lecture at the Botany School on Friday, November 19, at 5 p.m., on "A Botanical Journey in South-west Africa."

The general board of studies has approved Dr. C. S. Myers, of Gonville and Caius College, and A. E. Western, of Trinity College, for the degree of Doctor in Science.

LIVERPOOL.—Mr. W. S. Abell, instructor in naval architecture at the Royal Naval College, Greenwich, has been appointed to the chair of naval architecture endowed by Mr. Alexander Elder.

OXFORD.—Mr. Balfour will deliver the Romanes lecture in the Sheldonian Theatre on Wednesday, November 24. Lord Curzon of Kedleston, Chancellor of the University, will preside.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, November 11.—Sir Archibald Geikie, K.C.B., president, in the chair.—H. C. **Ross**: The vacuolation of the blood-platelets: an experimental proof of their cellular nature.—H. G. **Plimmer** and Captain W. B. **Fry**: Further results of the experimental treatment of trypanosomiasis, being a progress report to a committee of the Royal Society.—G. S. **West** and B. M. **Griffiths**: *Hillhousia mirabilis*, a giant sulphur bacterium. —Dr. H. B. **Fantham** and Miss Annie **Porter**: The modes of division of *Spirochaeta recurrentis* and *S. duttoni* as observed in the living organisms. The observations recorded were made on living Spirochætes. The examination of living material is imperative, as results based only on stained preparations are not always trustworthy. Both longitudinal and transverse division occur in Spirochætes, as seen in *S. recurrentis, S. duttoni, S. anodontae*, and *S. balbianii*. There is a periodicity in the direction of division exhibited by *S. recurrentis* and *S. duttoni*. At the onset of infection longitudinal division occurs. This is followed by transverse division of the