Colonel Kyd probably, as was the fashion of the day, had a town house in Calcutta. But he appears to have passed a good deal of his time at Shalimar; and in his will he directed that he should be buried in his garden there. The part of the Botanic Garden nearest to Colonel Kyd's house was devoted to the planting of teak trees, in accordance with the Company's earnest desire to supply themselves with timber for ship-building. The experience of thirty-four years having shown that good teak timber cannot be successfully raised on the muddy soil of the Gangetic delta, this part of the garden (extending to about forty acres) was in the year 1820 given up by Government to the Lord Bishop of Calcutta (Dr. Middleton) as the site for a Christian college. The Garden was thus reduced to its present area of 270 acres."

SCIENTIFIC SERIALS.

Bulletin of the New York Mathematical Society, vol. iii. No. 9, June 1894. (New York: Macmillan.)—Prof. E. W. Brown, under the heading "The Lunar Theory" (pp. 207-215). gives an admirable abstract of vol. iii. of Tisserand's "Théorie de Mécanique Céleste, Perturbations des Planètes d'après la Méthode de Hansen; Théorie de la Lune." Herein he opens with the remark: "It is somewhat strange that a subject like the lunar theory, which has received so much attention since its first principles were given by Newton, should be allowed to pass its second centenary before the appearance of a treatise like the present one." His opinion is that, notwithstanding a few defects, the book will take a high rank amongst the many classic treatises on celestial mechanics.—Students of the Theory of Numbers have recently been gratified by the publication (1892) of Bachmann's "Die Elemente der Zahlentheorie." An analysis of its contents, with a brief consideration of the parts which call for special remark, is given by Dr. J. W. A. Young (pp. 215-222).—Prof. Conant (pp. 223-224) calls attention to a work which occupies a unique place among translations, viz. "Memoirs on Infinite Series." These are classic memoirs by Lejeune-Dirichlet (2), Abel, Gauss, and Kummer. The book is brought out, under the auspices of the Tokio Mathematical and Physical Society, by Japanese professors.

IN the numbers of the *Journal of Botany* for June and July, Mr. A. B. Rendle describes new species of Asclepiadeæ and Convolvulaceæ from Tropical Africa, including a new genus of the former order *Odontostelma*, which is also figured.—A new British *Rubus*, *R. Rogersii*, n. sp., is described by Mr. E. F. Linton.—Mr. F. J. Hanbury contributes "A Tentative List of British *Hieracia*," numbering upwards of 100 species.

IN Nos. 5-7 of the *Bullettino della Societa Botanica Italiana* are two papers on fungus diseases of cultivated trees, by Sig. P. Baccarini. The "petecchia" or "vaiolo" (pock) of the orange has been ascribed to various causes. It is always accompanied by a number of fungi, but these are apparently saprophytic, and not pathogenic. The true cause appears to be a bacillus. The "mal nero" of the vine is also attributed to a microbe, *Bacillus vitivorus*, n. sp.—Sig. S. Sommier has two papers on the little-known flora of the Island of Giglio, near to Elba.—Sig. A. Jatta completes his paper on the lichens of Italy, of which he enumerates 1407 species.

THE number of the *Nuovo Giornale Botanico Italiano* for July is occupied by three papers:—"On the Roman Flora," by Sig. A. Terracciano; "On the Flora of Sicily," by Sig. L. Nicotra; and "On the Disease of the Strawberry caused by *Sphærella Fragariæ*," by Sigg. E. Baroni and G. Del Guergio.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 24.—"On the Influence of certain Natural Agents on the Virulence of the Tubercle-Bacillus." By Dr. Arthur Ransome, F.R.S., and Sheridan Delépine.

June 7.—"The Influence of Intra-Venous Injection of Sugar on the Gases of the Blood." By Dr. Vaughan Harley.

In a previous paper (*Roy. Soc. Proc.* 1893), he showed that the intra-venous injection of grape sugar caused an increase in the lactic acid in the circulation. It appeared probable that the lactic acid had combined with the bases of the carbonates in the blood, having driven out the carbonic acid.

Experiments were made on dogs to see what changes were produced in the gases of the blood after intra-venous injections of sugar.

It was found the quantity of carbonic acid was diminished, it being most markedly so during the first hour after the sugar injection, and still somewhat so three to five hours later. These results support the view that the lactic acid drives the carbonic acid from the sodium salts and replaces it.

In the next place, the changes met with in the quantity of oxygen in the blood were investigated. It was found the oxygen was markedly diminished during the first hour after the sugar injection. During the third and fifth hours the quantity in arterial was that usually found in venous blood. The explanation of this cannot up to the present be explained.

June 21.—"Researches on Explosives. Preliminary Note." By Captain Sir A. Noble, K.C.B., F.R.S.

The researches on which I, in conjunction with Sir F. Abel, have been engaged for very many years, have had their scope so altered and extended by the rapid advances which have been made in the science of explosives, that we have been unable to lay before the Society the results of the many hundreds of experiments under varied conditions which I have carried out. We are desirous also of clearing up some difficulties which have presented themselves with certain modern explosives when dealing with high densities and pressures, but the necessary investigations have occupied so much time that I am induced to lay a few of our results before the Society, trusting, however, that before long we may be able to submit a more complete memoir.

A portion of our researches includes investigations into the transformation and ballistic properties of powders varying greatly in composition, but of which potassium nitrate is the chief constituent. In this preliminary note I propose to refer to powders of this description chiefly for purposes of comparison, and shall devote my attention principally to gun-cotton and to those modern explosives of which gun-cotton forms a principal ingredient.

In determining the transformation experienced during explosion, the same arrangements for firing the explosive and collecting the gases was followed as are described in our earlier researches,[1] and the gases themselves were, after being sealed, analysed either under the personal superintendence of Sir. F. Abel, or of Prof. Dewar, and to Prof. Dewar's advice and assistance I am indebted, I can hardly say to what extent.

The heat developed by explosion, and the quantity of permanent gases generated were also determined as described in our researches, but the amount of water formed plays so important a part in the transformation that special means were adopted in order to obtain this product with exactness.

Numerous experiments were made to ascertain the relation of the tension of the various explosives employed, to the gravimetric density of the charge when fired in a close vessel, but I do not propose here to pursue this part of our inquiry, both because the subject is too large to be treated of in a preliminary note and because approximate values have already been published[2] for several of the explosives with which we have experimented.

With certain explosives, the possibility or probability of detonation was very carefully investigated. In some cases the explosive was merely placed in the explosion vessel in close proximity to a charge of mercuric fulminate by which it was fired, but I found that the most satisfactory method of experiment was to place the charge to be experimented with in a small shell packed as tightly as possible, the shell then being placed in a large explosion vessel and fired by means of mercuric fulminate. The tension in the small shell at the moment of fracture and the tension in the large explosion vessel were in each experiment carefully measured.

It may be desirable here to explain that I do not consider the presence of a high pressure with any explosive as necessarily denoting detonation. With both cordite and gun-cotton I have developed enormous pressures, close upon 100 tons per square inch (about 15,000 atmospheres), but the former explosive I have not succeeded in detonating, while gun-cotton can be detonated with the utmost ease. It is obvious that if we suppose a small charge fired in a vessel impervious to heat, the rapidity

[1] *Phil. Trans.* vol. clxv. p. 61.
[2] Noble, "Internal Ballistics," 1892, p. 33; *Roy Soc. Proc.* vol. lii. p. 128.