subject would do for botany what Sir H. E. Roscoe has done for chemistry he would confer a great boon on teachers and young students.

A. H.

Egyptian Figs.

MY attention has been called to a very obvious slip of the pen in my note on Egyptian Figs, in that I have written "Pliny" instead of "Theophrastus." The former, as all know, was a *Latin* author, but he simply copies from the latter. Having both authors before me at the time, I accidentally put one name for the others. The refs. are as follows:—Theoph. iv. 2; Dioscor. l. i; Plin. xiii. 7.

GEORGE HENSLOW.

A Palæozoic Ice-Age.

I CANNOT understand how, when writing on this subject *ante*, p. 101), I overlooked the circumstance that the ancient boulder-beds of Australia, India, and South Africa received full notice in Prof. J. Prestwich's "Geology," vol. ii. pp. 143-146.

December 9.

W. T. BLANFORD.

SCHEELÉ.

DURING this month Sweden commemorates the one hundred and fiftieth anniversary of the birth of one who has conferred an imperishable lustre on her annals. Carl Wilhelm Scheele—although a German by nationality, for he was born at Stralsund, the capital of Pomerania—spent practically the whole of his short life in Sweden, and is usually regarded as a Swede. The son of a tradesman, Joachim Christian Scheele, and the seventh child of a family of eleven, Scheele, as a boy, gave little promise of the genius and power which astonished the scientific world towards the close of the last century. It is perhaps indicative of a certain mental imperfection that he should have been wholly incapable of learning a foreign language; although he lived in Sweden during more than half his life his knowledge of Swedish was so imperfect that his memoirs, addressed to the Academies of Stockholm and Upsala, were invariably written by him in German and had to be translated by others before publication. By what influences he was led to the study of chemistry is unknown. There was nothing apparently in his home life, or in the mode or circumstances of his education to direct his inclination towards science. As a boy he began the study of pharmacy, and at his own wish was apprenticed to an apothecary at Göteborg named Bauch, with whom he remained eight years. Here he had access to the standard treatises on chemistry of that time, and he devoted all his leisure, often working far into the night, to the study of the works of Neumann, Lemery, Kunkel, and Stahl. Kunkel's *Laboratorium* was, indeed, his chief instructor in practical chemistry, and it was by diligently repeating, in the first instance, the experiments contained in that book that he acquired that extraordinary manipulative skill and analytical dexterity on which his success as an investigator ultimately rested.

When twenty-three years of age Scheele removed to Malmö, and some years afterwards to Stockholm, where he superintended the shop of an apothecary named Scharenberg. It was about this time that his career as a discoverer began, by the isolation of tartaric acid from cream of tartar. He ascertained many of the characteristic properties of this acid and prepared and examined a number of tartrates. These early efforts met, however, with a somewhat untoward reception. It seems that Scheele drew up an account of his observations and forwarded it to Bergman, who then filled the chair of chemistry in the University of Upsala as the successor of Wallerius. Bergman failed to appreciate the significance of the work of the young and unknown apothecary and by

some mischance the manuscript was lost. The importance of the discovery was, however, recognized by Retzius, who induced Scheele to write a second account of his work and to submit it to the Academy of Sciences at Stockholm, by whom it was eventually printed. In 1771 Scheele published his memorable essay, "On Fluor Mineral and its Acid," in which he first demonstrated the true composition of fluor-spar, showing that it "consists principally of calcareous earth saturated with a peculiar acid," named by him "fluor-acid." Although he found that the "fluor-acid" (hydrofluoric acid) dissolved "siliceous earth," he failed to recognize the change thereby produced in the "fluor-acid" and was thus led to an erroneous conception of its real nature. He was in fact led astray by the circumstance that his experiments were for the most part made in glass vessels, and hence the fluor-acid was contaminated with more or less silica and hydrofluosilicic acid. The origin of the silica in the acid prepared by Scheele was first clearly indicated independently by Wiegleb and Meyer. In 1773 Scheele went to Upsala as pharmaceutical assistant to Mr. Lökk, in whose shop he chanced to meet the chemist Gahn. Lökk and Gahn were speculating on the cause of the different mode of action of distilled vinegar on nitre before and after fusion. This was explained by the young assistant, who pointed out the nature of the change effected on nitre by fusion; and the fact that it is converted into a salt (potassium nitrite) from which a peculiar acid, different from true "spirit of nitre," can be obtained by treatment with distilled vinegar. Gahn, struck with the sagacity of the young pharmacist, offered to introduce him to Bergman. The invitation was at first declined; Scheele had not forgotten the unfortunate incident of the tartaric acid memoir. Eventually he allowed himself to be convinced that Bergman's action was due more to inadvertence than to indifference, and the acquaintance which followed rapidly ripened into a strong friendship. In 1774 Scheele, at the suggestion of Bergman, published his well-known memoir "On Manganese, Manganesium, or Magnesia Vitriarum." This essay, although marred and in part obscured by the phlogistic conceptions of the period, will for ever remain one of the classics of chemistry. In it Scheele not only established the nature of "pyrolusite" or "wad," but, in studying the action of acids upon the mineral, he was led to the discovery of baryta and of chlorine, the properties of which he minutely describes. In 1775 appeared his memoir on arsenic acid which he prepared in several ways; he discovered many of the more striking properties of this body and obtained a number of its salts. In the course of the investigation he discovered arseniureted hydrogen, and the well-known pigment Scheele's Green. In the same year he published his essay on benzoic acid, the "flowers of benzoin" of the apothecary. After a stay of two years in Upsala Scheele was appointed by the Medical College *provisor* of the pharmacy at Köping, a small town on the north shore of Lake Mälär. Instead of the prosperous business he had been led to expect he found nothing but discomfort and disorder, and the remainder of his life was spent in a constant struggle with privation and debt, relieved at length, to some extent, by a grant, at Bergman's instigation, from the Stockholm Academy. Of this money Scheele set aside one-sixth for his personal necessities, and devoted the remainder to his researches. In 1777 he took over the business of the pharmacy from the widow of the former proprietor, but it was only by unremitting industry that he was able to discharge the obligation he thereby incurred. Not a year passed, however, without Scheele publishing two or three memoirs, every one of which contained a discovery calculated to enhance his reputation as the greatest experimenter of his time. This untiring devotion to science at length began to tell upon a frame constitutionally weak and doubtless further enfeebled by privation, and by the worry