Prof. Einstein's Lectures at King's College, London, and the University of Manchester.

THE most noticeable circumstance in the lecture which Prof. Einstein delivered on June 13 at King's College on "The Development and Present Position of the Theory of Relativity" was the beauty and simplicity of his account of the theory. He made no attempt to enliven it by introducing any of the delightful illustrations which, however illuminating and attractive they may be to the popular mind, surround it with a halo of scientific romance. On the other hand, he found no occasion to have recourse to the blackboard, and he entirely omitted anything which required mathematical formulæ for its expression. He seemed, too, with earnestness and obvious sincerity to disclaim for himself any originality, and he deprecated the idea that the new principle was revolutionary. It was, he told his audience, the direct outcome and, in a sense, the natural completion of the work of Faraday, Maxwell, and Lorentz. Moreover, there was nothing specially, certainly nothing intentionally, philosophical about it. The whole theory was experimental in its origin, and the satisfaction it brought was simply in the fact that it put us in possession of a method of scientific research which not only did not bring us into conflict with observed facts, but also positively accorded with them.

The most absorbing part of the lecture was the exposition of his concept of our universe as being spatially a closed system and yet boundless. In this connection he referred to the work of Ernst Mach, who had been the first to direct attention to a distinct point in which the Newtonian theory of motion is unsatisfactory. It led Mach to endeavour to alter the mechanical equations so that the inertia of bodies should be attributed to their relative motion with reference, not to Newton's fictitious absolute space, but to the sum total of all other measurable bodies.

Prof. Einstein's modesty served only to give force to the impression which all received, and which Lord Haldane (who presided) admirably expressed, that we were welcoming not only one who is himself a man of genius, but one whose discovery is to be ranked with those of Newton, Galileo, and Copernicus—discoveries which in revolutionising thought have turned scientific inquiry in a new direction and enlarged the scientific horizon. In one aspect, as Lord Haldane pointed out, Einstein's revolution is more profound than that of the greatest of his predecessors, for while Copernicus and those who followed him corrected our deductions from phenomena within a generally accepted framework, Einstein has shown us the need of reconstituting our conception of that framework itself. It is not of choice, but of necessity, that the principle of relativity has raised a problem, and that the profoundest problem, in metaphysics—the problem of the relation of reality itself to knowledge.

After the public lecture Prof. Einstein was the guest of the Principal of King's College at a dinner given in the college. The Principal's guests included Lord Haldane, the Dean, the Vice-Principal, and many of the professors of King's College, the Astronomer Royal, Prof. Eddington, Prof. Lindemann, Prof. Whitehead, and others. In responding to his health, Prof. Einstein made an interesting revelation of his attitude to the quantum theory. This theory was, he said, presenting a difficult problem to physics, but the very nature of the difficulty served to bring into relief the attractiveness and satisfaction of the principle of relativity. That principle had served to give a simple and complete explanation of experimental facts which under any other aspect were discordant. In the quantum theory as it stood at present we were faced with discordant experimental facts, and were searching for the principle on which to interpret them.

The Adamson lecture was delivered at the University of Manchester on Thursday, June 9, by Prof. Einstein, who had been invited by the council in accordance with a Senate recommendation passed on February 3. At the opening of the proceedings the honorary degree of D.Sc. was conferred on Prof. Einstein. The lecture, which was delivered in German without an interpreter before a very large audience, was on the theory of relativity, and dealt in particular with the relation between geometry and physics. Prof. Einstein described how geometry had developed from a collection of individual theorems discovered empirically to a body of doctrine in which the logical connection between these theorems is perceived and explained. The logical structure required as its foundation a set of axioms, which constitute the residue of empiricism in the theory. The axioms of Euclid acquired such authority that in time they came to be regarded as necessities of human thought owing to the inherent nature of the mind, and thus the illusion was created that Euclidean geometry is free from anything empirical or arbitrary. On applying geometry to physics the tacit assumption was made that lengths measured by and on solid bodies correspond to lengths in Euclidean geometry. Prof. Einstein showed how the gradual discovery, through physical experiment and observation, of the fact that for objects of astronomical dimensions the axioms of Euclid do not hold good, had led first to the special, and then to the general, theory of relativity. He devoted the latter part of his lecture to the exposition of a non-Euclidean geometry (interpreting geometry in the sense of the theory of the possible positions of objects in space) in a plane, the objects in the plane being shadows of circular "beetles" inhabiting a sphere, the source of light being on the sphere, and the plane being a tangent plane at the opposite end of the same diameter.

Physico-chemical Problems Relating to the Soil.

THE Faraday Society held a general discussion on May 31 on physico-chemical problems relating to the soil. Sir Daniel Hall, in taking the chair, said that the papers to be presented would show that physico-chemical studies of soil were now as necessary as those of a purely chemical or physical nature.

Dr. E. J. Russell, director of the Rothamsted Experimental Station, in opening the discussion, gave a general review of the phenomena associated with the four main headings into which the subject was divided:—Soil moisture, organic constituents of the soil, adsorption phenomena, colloidal phenomena, etc.

The section on soil moisture was opened by Mr. B. A. Keen (Rothamsted), who dealt with the system soil–soil moisture, and pointed out that it was necessary to assume a complex colloidal coating over the soil-grains. The paper concluded with an account of the quantitative relations brought out by the freezing-point method of examining soil solution. Prof. Sven Odén (Stockholm), in a note on the hygroscopicity of clay, showed that the hygroscopicity of soils was not necessarily proportional to the total surface area of the particles. Prof. Hoagland (University of California) and Prof. Shull (University of Kentucky) forwarded papers dealing with the relation between the soil solution and the plant. The former dealt mainly