

models, charts, maps and photographs. It will include models of every type of air liner which has been owned by the Company since its inception, and sectional models of the new "Empire" flying-boat, the new Armstrong-Whitworth 4-engined land machine (A.W. 27) and the Short-Mayo "composite" marine aircraft, now under construction. The latter is of special interest as an entirely new project designed to meet the requirements of trans-Atlantic services. A part of the exhibition will be devoted to the design of air ports, and will include a large model of a modern combined land and air port, and dioramas of three famous Empire air ports. There will also be working models showing the part which wireless plays in the control of aircraft when flying in fog or above cloud. There will be sections devoted to the building of a flying-boat and a land machine and to aero engines. Operable models of a wind tunnel and a tank will enable the visitor to gain some idea of the part which these instruments play in the design of air liners. The exhibition should prove of considerable educational interest at the present time, and will serve to show the remarkable developments which have taken place in air transport during recent years; by way of comparison, the earlier historical development in aviation can be seen in the usual gallery of the National Aeronautical Collections in the Museum.

Alchemy and Music

THE audience for the Friday evening discourse delivered at the Royal Institution on November 22 had a double treat, for after listening to Prof. John Read's address entitled "A Musical Alchemist", some recently transcribed music by Count Michael Maier (1618) was sung by student members of the St. Andrews University Choir under the direction of Mr. F. H. Sawyer, lecturer in music in the University. Certain alchemical works published at or near Frankfort during the seventeenth century, largely under the name of Michael Maier, are rich in allegorical illustrations, which Prof. Read terms, for convenience, 'the Frankfort emblems'. The publishing firm of Lucas Jennis of Frankfort took a prominent part in issuing Maier's works. His emblems are often provided with a Latin epigram, together with a cryptic title and a discourse in the same language. "Atalanta Fugiens", or "Atalanta Fløeing", published by Maier at Oppenheim in 1618, contains fifty such epigrams, written in elegiac couplets and set to music by the versatile author. Maier's so-called 'fugues' are in reality rounds, or canons, for three voices. At the end of Prof. Read's discourse, Mr. F. H. Sawyer, who has made a close study of this interesting alchemical music, explained its construction and characteristics, after which examples were sung. It is to be presumed that these 'incantations' were intended to be sung at critical moments during the decoction of the Philosopher's Stone, such operations being directed also by prayer and astrological influences. To what extent Maier, or other alchemists, endeavoured to influence their laboratory operations by means of music is not clear. However, in view

of the alchemical belief in the beneficent influence of music, it is likely that the processes of the 'Great Work' were sometimes performed to the accompaniment of musical chants or incantations.

Dangerous Reflexes of Car Drivers

"How Cars go out of Control: an Analysis of the Driver's Reflexes" is the title of a paper by Dr. Yandell Henderson, professor of applied physiology in Yale University, read before the National Academy of Sciences, Washington, on November 18. He attributes this situation to the 'self-righting' reaction which is instinctively and irresistibly excited by any sudden severe disturbance of equilibrium. The self-righting reaction is proverbial in the cat: no matter how the cat is dropped, it lands always on its feet. Into this neuro-muscular complex in man enters the 'extensor thrust' reflex of the lower limbs, owing to which a motor-car driver, often quite unawaredly, presses the accelerator pedal hard down, and continues to do, thus sending the car completely 'out of control'. Prof. Henderson realises that we cannot change the nature of so primitive a danger-response. His remedy consists in placing a pedal for the left foot "so low as scarcely to rise above the floor, but wide enough so that extension of the leg will always bring the foot to bear on it". The extensor thrust reflex involves both feet. The left pedal will be so connected that heavy pressure on it will either counteract the action of the right foot and so close the throttle, or will directly shut down the carburetter. From statistical studies, Prof. Henderson believes that at least ten per cent of fatal car accidents are attributable to the car being 'out of control' through the 'extensor thrust' of the driver's legs.

Rectifiers used on the London Underground Railways

WHEN an alternating current arc is established in a vacuum tube between a mercury and an iron or graphite electrode, the current only passes during half the time, namely, when the mercury pool is the negative electrode. The alternating current is thus converted into a pulsating direct current, the tube (rectifier) thus acting as a valve allowing the current to flow in one direction and not in the other. In a paper on the steel tank rectifiers operating on the underground railways of the London Passenger Transport Board, read by A. L. Lunn to the Institution of Electrical Engineers on November 7, a description of the rectifier substations is given and also much useful information of the working of these rectifiers for traction purposes. When the electric railways first started, they were supplied by three phase A.C. from the Lots Road generating station, the current being converted into direct current by means of rotary converters before reaching the trains. These machines were virtually A.C. motors on one side and D.C. dynamos on the other. For running machines, rotary converters are comparatively quiet, and there is little vibration; but in these respects the rectifier is much superior. The substation buildings for operating the traction system of the London