

Fig. 18. My assistant spins the flywheel of the large gyrostat, which is then suspended by means of a string and hook from the upper bar of the frame. At present the centre of gravity of the gyrostat is vertically below the hook, and under these conditions there is no precessional motion. He now spins the two small gyrostats and attaches them to the large one. Each small gyrostat, you will observe, is carried by two sleeves which are threaded on a horizontal bar. The hook is now transferred to one of the side recesses provided in the upper bar of the large gyrostat, and the system is left to itself, when it turns round in azimuth. One of the small gyrostats throws itself up and balances on the bar.

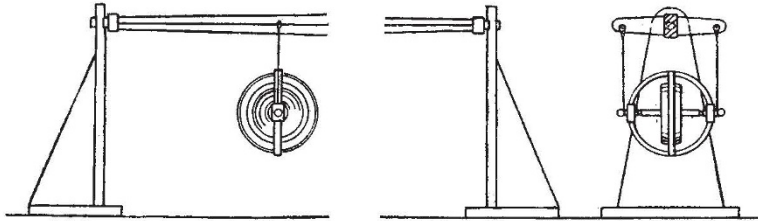


FIG. 17.

The experiment is repeated with the hook engaging in the other side recess, when you observe that the small gyrostat which previously occupied the lower position now rises into the upright one, and the gyrostat which occupied the upright position now occupies the lower one.

This top admits of a large variety of designs. It is easy to imagine a gyrostatic circus rider performing balancing feats on the back of a gyrostatic horse!

I conclude with a gyrostatic model which depends for its action upon an entirely novel and prac-

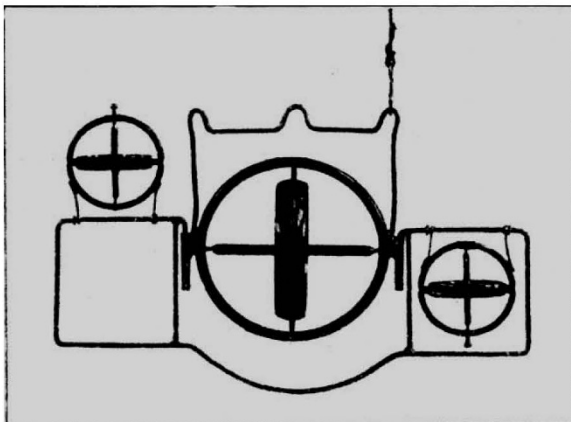


FIG. 18.—Acrobatic top.

tical method of operating a gyrostat or gyrostats. The method has a very large variety of applications, into which I shall not enter at present. It is here shown applied to a motor-car. The car runs on two wheels in tandem; it can be set to run either in a straight path or a path curved in either direction. You observe that the arrangement includes two parts connected by a vertical or nearly vertical hinge. Each is supported on a single wheel. The front part carries a gyrostat with axis horizontal (in this case), the after-part contains the propelling mechanism. A quasi-gravitational field of force is produced by the propeller behind acting through the hinge.

The car can be made to go round in any curve

by a weight placed on one side, when it will be seen that it leans over to the inside of the curve.

The balancing power is very great; even when a weight comparable with that of the entire car is mounted on a vertical rod carried by the structure, the device does not fall down. In fact, it is dynamically impossible for the car to overturn.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—It is proposed to confer the degree of Doctor of Law, *honoris causa*, upon Admiral Sir Wilmot H. Fawkes, G.C.B., and Mr. J. S. Sargent, R.A.; and the degree of Doctor of Letters, *honoris causa*, upon his Excellency Adolph H. G. Wagner, professor of political economy in the University of Berlin; Sir Frederic G. Kenyon, K.C.B., director and principal librarian of the British Museum; Sir John Knox Laughton, professor of modern history in the University of London; Sir James A. H. Murray; Prof. C. Bémont, professor of history in the Sorbonne; Mr. Thomas Hardy, O.M.; and Mr. Reginald L. Poole, keeper of the archives of the University of Oxford.

Sir Robert Rede's lecturer for the present year, Earl Curzon of Kedleston, will deliver the lecture in the ensuing Michaelmas term, not, as previously announced, in the present term.

The Linacre lecture, at St. John's College, will be delivered by Dr. Norman Moore, on Tuesday, May 6, at 5 p.m., in the lecture-room of anatomy and physiology, New Museums. The title of the lecture is "The Physician in English History."

MR. W. W. HORNELL, formerly of the Indian Educational Service, and now of the Board of Education, has been appointed Director of Public Instruction in Bengal.

THE council of the South African School of Mines and Technology has made the following appointments to the staff—Dr. G. S. Corstorphine, consulting geologist, of Johannesburg, to be principal of the school and professor of economic geology; Mr. J. S. Cellier, mining engineer, of Johannesburg, to be professor of mining.

MR. PEASE made his annual statement as President of the Board of Education in the House of Commons on April 10. In the course of his remarks he said that the number of pupils in receipt of free tuition in the 885 secondary schools receiving Government grants last year was 52,563, of whom 49,120 came up from the elementary schools. The staffing of the secondary schools is one teacher to every 32.5; of the elementary schools one teacher to every 13.5. There are twenty training colleges, and their total output of trained teachers last year only reached forty men and 195 women. At the continuation schools only 13 per cent. of the total population under seventeen are in attendance. A course of from two to four years will be established in day trade schools. There is room for twenty more in London and 150 in the country. The 2l. 17s. per head granted by the Government is wholly inadequate, and Mr. Pease has been able to increase the grant to 5l. in land schools and 10l. to the various training ships. The Science Museum is about to be built on a site in Exhibition Road, South Kensington. It is proposed to erect the

building in three blocks; the foundations of the first block have already been commenced, and about 110,000*l.* will be spent in the erection. Sir Hugh Bell, Sir Henry Roscoe, and other distinguished men of science have undertaken to advise in connection with the scope of this museum, the organisation of the collection, the policy to be followed in regard to the collection to be placed in the new building, and also as to what should be the relation of the museum to other societies and museums.

THE final report of the Royal Commission on University Education in London has just been issued as a Blue-book (Cd. 6717, price 2*s.*). The following are among the principal conclusions and recommendations:—(1) The Commissioners consider the whole organisation of the University fundamentally defective—(a) because of the present relations between the internal and external sides of the University; (b) because of the existing combination in the University of a large number of institutions differently related to it. (2) They propose that external students should continue to be admitted to the general examinations in the United Kingdom in all degrees except those in medicine and technology. Pupils still at school, however, would not be admitted, and students in constituent colleges or in University departments would not be admitted to these examinations in any faculty in which a special examination was open to them without the leave of the proper University authorities. (3) The University in future would consist of constituent colleges and University departments. The constituent colleges will be institutions either established by the University or existing institutions which are strong enough in one or more faculties to comply with the conditions for incorporation, and which transfer to the University the financial and educational control of their work in one or more of these faculties. (4) The normal portal of entrance to the University would be a school examination, established on the lines recommended by the Consultative Committee, instead of the present matriculation. (5) In order to reconstitute the University on these lines an additional income of 99,000*l.* would be required. We hope to deal further with the report in an early issue.

SOCIETIES AND ACADEMI LONDON.

Royal Society, April 10.—Sir Alfred Kempe, vice-president and treasurer, in the chair.—L. Hill and M. Flack: The effect of lability (resilience) of the arterial wall on the blood pressure and pulse curve.—Prof. J. H. Priestley and R. C. Knight: The nature of the toxic action of the electric discharge upon *Bacillus coli communis*. (1) Electric discharge in air is fatal to bacteria exposed to its action. (2) The effect is due to the products of the interaction of the constituents of the air, namely nitric and nitrous acid and ozone. (3) Discharge in air-free hydrogen has no deleterious effect on the organisms, but the presence of small quantities of air allows the formation of a toxic substance, probably hydrogen peroxide, which again exerts a bactericidal action. (4) It, therefore, follows that electric discharges in which the current density does not exceed 10^{-3} amperes per square centimetre do not exert any directly toxic action upon micro-organisms, a result which is contrary to the statements made by some previous investigators.—S. B. Schryver: Some investigations on the phenomena of "clot" formations. Part I. The clotting of milk.—Surg-General Sir D. Bruce, Majors D. Harvey and A. E. Hamerton, and Lady Bruce: (1) Morphology of various strains of the trypanosome causing disease in

Nyasaland. II., The wild game strain. (2) Morphology of various strains of the trypanosome causing disease in man in Nyasaland. III., The wild *Glossina morsitans* strain. (3) Infectivity of *Glossina morsitans* in Nyasaland.

Linnean Society, April 3.—Prof. J. Stanley Gardiner, F.R.S., vice-president, in the chair.—Prof. A. Dendy: The calcareous sponges collected in the Indian Ocean on the Percy Sladen expedition. Of more than 400 species of *Calcarea* known, the present collection consisted of thirteen species, several of which were new to science.—Dr. J. D. F. Gilchrist: Larval stages of *Jasus lalandii* (Milne-Edwards).—R. S. Bagnall: The classification of the order Symphyla.

Royal Astronomical Society, April 11.—Major Hills, F.R.S., president, in the chair.—Mrs. Evershed: Some types of prominences associated with sun-spots. The paper was illustrated by forty slides of photographs of various forms of prominences situated over sun-spot groups; the photographs were arranged in eleven series, to show the successive changes in individual prominences. Their motions are intermittent, and vary in amount, thus differing from the motions observed in spot penumbrae, which are uniform and constant. The outward moving gas frequently falls back upon the chromosphere, sometimes forming massive banks, and sometimes rising and falling like fountains.—Miss Blagg: A suggested substitute for Bode's law. The law itself and the various hypotheses put forward to supplement it were explained. The author's theory agreed much better than Bode's law with the actual distances of planets and satellites; it strengthened the view that tidal action had always been small, and that satellites had not greatly altered their distances.—Joel Stebbins: The selenium photometer. The principle of the instrument, which was in use at the Illinois Observatory, was founded on the fact that the electrical resistance of selenium varied when exposed to light. Many irregularities were found in its use as a stellar photometer, but these were reduced by keeping it at a low temperature; about -20° C. was found most convenient.—Dr. F. W. Dyson: The distribution in space of the stars of Carrington's circumpolar catalogue.—E. E. Barnard: Observations of the variable star 97, 1910 Cygni, at the Yerkes Observatory. The star, which had a period of nineteen or twenty months, was remarkable for its extreme faintness at minimum, when it was beyond the reach of the 40-in. telescope.—H. C. Plummer: Preliminary discussion of the galactic motions of the bright stars of type I.—A. C. D. Crommelin: Comparison of the moon's coordinates for 1914, according to the new Delaunay tables, with those given in the Nautical Almanac.

PARIS.

Academy of Sciences, April 7.—M. F. Guyon in the chair.—J. Boussinesq: The application of the formulæ of superficial viscosity to the surface of a spherical liquid drop, falling slowly, with uniform motion in the midst of an indefinite liquid mass in repose and of a density slightly lower than that of the drop.—M. de Forcrand: The dehydration and decomposition of the hydrates of uranyl nitrate. The formation of a monohydrate.—Charles Depéret: Observations on the geological Pliocene and Quaternary history of the gulf and isthmus of Corinth.—J. Guillaume: Observations of the sun made at the Observatory of Lyons during the third quarter of 1912. The results are given in three tables showing the number of spots, the distribution of the spots in latitude, and the distribution of the faculæ in latitude.—Stanislas Belsetsky: The stability of equilibrium in a particular case of a piece