Man," but it is not yet possible to map the distribution of most of the toys and games, to trace their origin, or to indicate the meaning that in many cases was primitively attached to their exercise.

Thanks to the investigations of Messrs. A. MacFarland Davis, F. Cushing, Stewart Culin, G. A. Dorsey and others, we have some indication concerning the variations, distribution and significance of the principal games of the North American Indians. Some hundred or so of these games are known, which can, however, be reduced to six main groups. These are derived from the employment of the shield and spear, marked arrows, shields on which were painted the four world quarters, and balls. Some of these games may have been originally merely games of skill, others were divinatory, while others, again, were doubtless magical.

In that vague region known as the Far East, the fragmentary evidence points to similar conclusions as the researches, amongst others, of Messrs. Stewart Culin, G. von Schlegel, R. Andree and E. B. Tylor. The same, too, appears to hold good for Oceania.

These general remarks will show how important it is that further evidence should be collected, and will indicate the welcome that will be given to the last of Dr. Walter E. Roth's studies in the ethnography of North Queensland. The following is Dr. Roth's classification of games, sports and amusements:—(1) Imaginative games, such as tales, of which nine are given. (2) Realistic games, playing with pets, playing with plants, making smoke spirals, bathing, &c. (3) Imitative games, objects and phenomena of nature imitated by attitudes, movements and paintings; the author figures seventy-four

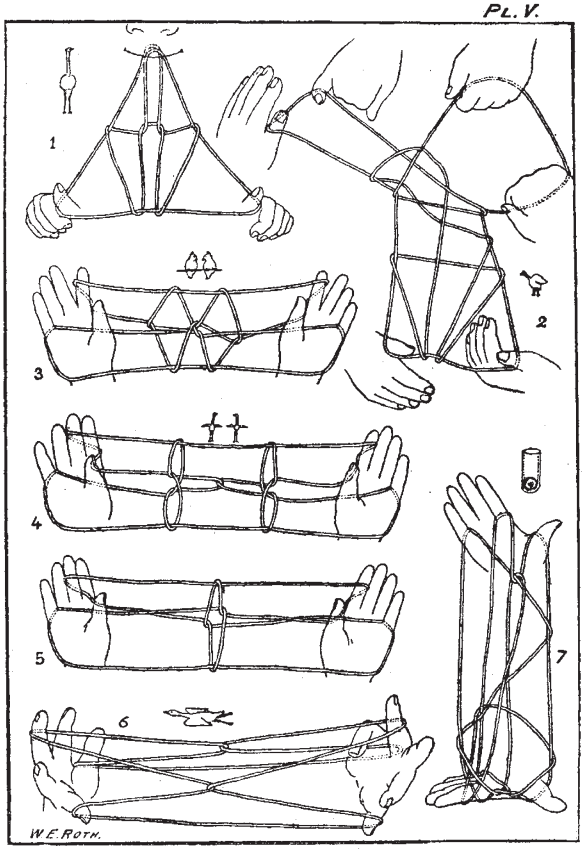

FIG. 1.

examples of those ingenious string figures in which so many primitive peoples excel. Very few illustrations of "cat's cradles" have ever been published, so that we cannot at present say how far particular devices are common to different peoples. One at all events (Plate v., Fig. 6), which represents a duck flying (Fig. 1), is similar to a string figure in Torres Straits which is called "throwing the fish spear," but this is a very simple figure to make. In this category are placed all those games in which children imitate their elders. Several round games are described in which "collecting honey,"

FIG. 2.

"catching cockatoos" and similar operations are represented; one of them, "playing bean tree" (Fig. 2), resembles a game I have described as played by Papuan children ("Head-Hunters, Black, White and Brown," 1901, chap. xv.). There are other analogies between the games of the aborigines of North Queensland and those of the Papuans. (4) Discriminative games, hide and seek and a guessing game. (5) Disputative games, wrestling, tug-of-war. (6) Propulsive games, ball games, tops, stick-throwing games, &c.; amongst the latter are certain methods of casting petioles of grass blades similar in principle to what is done by certain Papuan children. Of special interest is the hurling of a toy spear by means of a knotted string; a similar device was used by the men of the Southern New Hebrides, New Caledonia and the Loyalty Islands, and the present writer has recorded it as a child's plaything at Delena, Hall Sound, British New Guinea, and now it has turned up amongst the coastal blacks of North Queensland. (7) Exultative games, songs, dances, music. This little memoir, which is illustrated by thirty-nine plates, is full of valuable information, as it opens up a new field to the student.

A. C. H.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

SIR GEORGE G. STOKES, Bart., F.R.S., senior fellow and president of Pembroke College, Cambridge, has been elected master of the College, in succession to the late Dr. Searle.

DR. W. PALMER WYNNE, F.R.S., assistant professor of chemistry in the Royal College of Science, South Kensington, has been appointed to the chair of chemistry in the School of Pharmacy of the Pharmaceutical Society of Great Britain in succession to Dr. J. Norman Collie, F.R.S., who was recently appointed to the chair of organic chemistry in University College, London.

THE council of University College, Liverpool, has unanimously agreed to invite Dr. Benjamin Moore to accept the chair of biochemistry recently founded in University College by Mr. William Johnston. Dr. Moore is now lecturer on physiology in the Charing Cross Medical School, and has made himself widely known among men of science as a successful teacher and an original investigator.

MR. J. QUICK has been appointed principal of the Technical Institute, Limerick.

AFTER a discussion extending over several sittings, the seventh clause of the Education Bill has passed Committee of the House of Commons in an amended form. The clause refers to the management of elementary schools, and it raised the

question as to the proportion of popularly elected managers which should act as bodies controlling the work of voluntary and denominational schools. The clause as amended provides that the management board of every public elementary school not provided by the local educational authority shall consist of four foundation or trust managers and two managers appointed by elected bodies. This principle has been accepted as part of the Bill. The discussion of the whole question of the machinery by which the managers of voluntary schools are to be elected has been postponed until the autumn session.

THE Ministerial changes consequent upon the resignation of Lord Salisbury, and the appointment of Mr. Balfour as Premier, involve a reconstitution of the representatives of the Board of Education in Parliament. Sir John Gorst, who has been Vice-President of the Committee of Council for Education since 1895, has resigned, and his office becomes extinct. The Duke of Devonshire remains Lord President of the Council, but ceases to preside over the Education Department. The newly constituted Board of Education has for its President the Marquis of Londonderry, who was chairman of the London School Board some years ago, and as Parliamentary Secretary Sir William Anson, member for the University of Oxford and a leading authority upon educational matters. The Duke of Devonshire will therefore no longer be directly concerned with departmental work in education, though he will have charge of the Education Bill when it reaches the House of Lords.

THERE is a feminine and a masculine type of mind. The former depends chiefly on memory and being reproductive; the other relies upon reasoning and being creative. The mind of the man of science is masculine, that of the clergyman is feminine. Not every woman possesses a feminine mind, though many men have little else. The whole of our education from top to bottom is essentially feminine, chiefly because in its origin and continuance it is clerical. Such are but a few of the opinions expressed by Mr. James Swinburne in an article on "Feminine Mind Worship" in the current number of the *Westminster Review*. The whole article is a powerful appeal for a fuller recognition of the value in education of a rational training in the methods of science, so that boys may obtain at school such a practical acquaintance with experimental physics and chemistry as will lead them to develop their reasoning faculties and endow them with those powers of initiative which are essential, since the whole welfare and existence of a commercial country like ours depends on the application of science and the work of the despised masculine mind. Mr. Swinburne's essay deserves to be widely read.

SCIENTIFIC SERIALS.

Bulletin of the American Mathematical Society (2) viii. No. 9, June.—T. J. I'A. Bromwich, on the infinitesimal generators of parameter groups. The author gives a simplified method of calculating the generators of a group of known structure, and compares his results with those of Slocum (*Bulletin* for January).—E. V. Huntington, a second definition of a group. The definition is reduced to four independent postulates, to which a fifth must be added if a distinction is to be made between finite and infinite groups.—G. A. Miller, determination of all the groups of order p^m, p being any prime, which contain the Abelian group of order p^{m-1} and of type (1, 1, ...).—L. E. Dickson, a class of simply transitive linear groups.—D. N. Lehmer, errors in Legendre's tables of linear divisors.—Reviews of Gray's "Treatise on Physics," vol. i., Cellérier's "Cours de Mécanique" (E. B. Wilson), and Kiepert's "Grundriss der Differential- und Integral-Rechnung" (E. W. Davis).

Annals of Mathematics (2) iii. No. 4, July.—H. S. White, note on a twisted curve connected with an involution of pairs of points in a plane.—R. E. Allardice, on some curves connected with a system of similar conics.—J. Westlund, note on multiply perfect numbers.—W. R. Ransom, a mechanical construction of confocal conics.—P. F. Smith, on Sophus Lie's representation of imaginaries in plane geometry. This is an interesting commentary on Lie's first paper, published in the *Transactions* of the Academy of Christiania in 1869.—G. A. Miller, note on the group of isomorphisms of a group of order p^m.—L. D. Ames, evaluation of slowly convergent series.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 19.—"On the Measurement of Temperature." Part i.—On the Pressure Coefficients of Hydrogen and Helium at Constant Volume and at different Initial Pressures. Part ii.—On the Vapour Pressures of Liquid Oxygen at Temperatures below its Boiling Point on the Constant Volume Hydrogen and Helium Scales. Part iii.—On the Vapour Pressures of Liquid Hydrogen at Temperatures below its Boiling Point on the Constant Volume Hydrogen and Helium Scales. By Morris W. Travers, D.Sc., Fellow of University College, London, George Senter, B.Sc., and Adrien Jaquerod, D.Sc. Communicated by Prof. William Ramsay, F.R.S.

Part i. (M. W. T. and A. J.).—The pressure coefficients were determined by measuring the pressure which the gases exerted when the bulb of the constant-volume thermometer was surrounded with melting ice, or with steam at the boiling point. The apparatus employed cannot be described in this abstract; it was completely constructed of soda-glass, and as all junctions were sealed in the blowpipe flame, leakage of the gas was impossible. By enclosing the manometer column and *dead space* between parallel glass plates in a water jacket, it was possible to measure the temperature of these parts of the apparatus to 0°·02 C. and thus eliminate errors which might seriously affect the results.

The pressure coefficient at an initial pressure of 700 millimetres in the case of either gas appears to have the value 0·00366255, which does not differ appreciably from that obtained by Chappuis for hydrogen at an initial pressure of 1000 millimetres of mercury. At a pressure of 520 millimetres no appreciable decrease in the value of the coefficient could be detected. As has hitherto been assumed, the pressure coefficient for hydrogen, and also for helium, appears to be independent of the pressure, so far as thermometric observations are concerned.

Part ii. (M. W. T., G. S. and A. J.).—Previous investigators have measured the boiling point and vapour pressures of liquid oxygen by immersing the thermometer in a mass of the liquid and measuring the pressure under which it was evaporating. This method is unsatisfactory on account of the difficulty of obtaining pure oxygen in sufficient quantity, and of the tendency of the liquid to become superheated.

In the experiments described in this paper, a bulb in which a small quantity of pure oxygen could be liquefied was immersed, together with the bulb of the thermometer, in a vacuum vessel containing liquid air or oxygen, through which a rapid current of air was passed. The bulb containing the pure oxygen communicated with the lower chamber of a barometer, so that measurements of the vapour pressures were quite independent of the atmospheric pressure.

Four thermometers were employed in these experiments, the capacities of the bulbs being approximately 90 c.c., 12 c.c., 26 c.c. and 27 c.c. The large thermometer was employed in one series of measurements only, as it was found to be difficult to maintain so large a bulb at a constant and definite temperature without employing very large quantities of liquid air. The temperatures obtained by means of the three smaller thermometers rarely differed by more than 0°·03 from the temperature, corresponding to the same pressure, taken from the smoothed vapour-pressure curve. The pressure on the gas at the ice point was in every case about 1000 mm. of mercury.

The thermometers were so constructed that the pressure on the gas could be measured independently of the atmospheric pressure. The temperature of the dead space was determined by means of a mercury thermometer, and the temperature of the vertical portion of the stem above the thermometer bulb was measured by means of an auxiliary gas thermometer, of similar construction, with a narrow cylindrical bulb of the same length as the stem. The coefficient of expansion of the glass was found to be 0·0000284 between 0° and 100° C., and 0·0000218 between 0° and −190° C.

Vapour Pressures of Liquid Oxygen.

Pressure in millimetres.	Temperature on hydrogen scale.	Temperature on helium scale.
800	90°·60	90°·70
760	90·10	90·20
700	89·33	89·43
600	87·91	88·01
500	86·29	86·39
400	84·39	84·49
300	82·09	82·19
200	79·07	79·17