

reduction in viability is due to the diminution in quantity or loss in quality of the enzymes in the seeds. Some very interesting experiments made in the experiment station of the University of Vermont tend to establish this theory, as well as to offer some applications of practical value. Various old seeds were treated with different enzym solutions and were then placed in suitable apparatus for germination. One lot of tomato seeds, twelve years old, soaked for twenty-four hours before germination, gave the following results:

Soaked in water,.....	28	per cent.	germinated.
Soaked in trypsin,.....	56	"	"
Soaked in Extractum pancreatis,.....	36	"	"
Soaked in Enzymol, .....	52	"	"

Another lot of seeds of another variety of tomato, twelve years old, gave these results:

Soaked in water,.....	34	per cent.	germinated.
Soaked in diastase, .....	70	"	"

One of the most remarkable experiments was with another lot of tomato seeds, also twelve years old. The result stood:

Soaked in water,.....	12	per cent.	germinated.
Soaked in pepsin, .....	80	"	"
Soaked in diastase, .....	85	"	"

This shows an increase of 567 per cent. and 608 per cent. respectively in the germination through the action of the enzymes artificially supplied. Other seeds of other species and other enzymic preparations gave similar results.

In view of our present knowledge it seems quite fair to hope that, when we understand better the enzymes and their relation to the processes of vegetable physiology, we shall be able to control to our advantage many of the critical steps in plant development.

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#### CURRENT NOTES ON ANTHROPOLOGY.

##### THE OLDEST CRANIA FROM CENTRAL MEXICO.

IN his work, 'Anthropologie du Mexique,' published in 1884, Professor Hamy gave the measurements of a number of skulls obtained from sepultures of uncommon depths in various parts of central Mexico. Those at Tlaltelolco were from seven to eight feet below the surface and appeared to date from a remote antiquity. These skulls were all characterized by marked brachycephaly, with indices of 85 and upward.

In the *Bulletin du Museum d' Histoire Naturelle*, 1897, No. 6, the same author reports the measurements of five skulls from very ancient burial sites in the district of Colotlan, State of Jalisco. The cranial capacity is good (male 1485, female 1280), but all five of them were remarkably brachycephalic, the average being above 86, and the highest reaching 92.40!

The modern graves, on the other hand, yield skulls which are distinctly dolichocephalic, and the present native population is of this character. They are the Guicholas, speaking a dialect of Nahuatl. They assert that these older graves are not those of their ancestors, but of another race; and the difference in the art-remains substantiates this tradition. Professor Hamy concludes that all the oldest tribes of central Mexico were broad-skulled, with marked alveolar prognathism.

##### THE OLD LAND-BRIDGE TO EUROPE.

IN the introduction to my 'American Race' I pointed out the arguments for the existence of a land-bridge from North America to Europe in pleistocene times, across which the ancestors of the American man might have journeyed. Since the publication of that work a number of writers have advocated this hypothesis, as Georges Hervé, Charles Tissot, M. Lapparent, etc. The latest is M. Philippe Salmon, ex-President of the Anthropological Society of Paris.

In a paper in the *Revue Mensuelle* of the Paris School of Anthropology, for September, he undertakes to locate the period of the final disruption of the two continents more accurately than heretofore.

He carefully considers the pleistocene fauna of both areas, compares the states of the earliest arts, and especially lays stress on the time and manner of the disappearance of the reindeer in France, and the sudden change of climate from arctic to temperate conditions which that indicates. The cause of this change was the altered direction of the current of the Gulf Stream owing to subsidence of the land areas. His article entitled 'L'Atlantide et le Renne' will be found highly suggestive.

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#### SCIENTIFIC NOTES AND NEWS.

##### AMERICAN MATHEMATICAL SOCIETY.

THE annual meeting of the American Mathematical Society will be held on Wednesday, December 29th, in Room 301 of the Physics Building of Columbia University, New York City. In accordance with the provisions of the constitution of the Society, the annual election of officers will be held at this meeting, and a presidential address, 'On the Philosophy of Hyperspace,' will be delivered by President Simon Newcomb. The sessions will begin at 10:30 a. m. and 2:30 p. m., and the Council will meet at 2 p. m.

The following is a list of papers thus far entered for presentation at the meeting:

##### *Morning Session.*

(1) 'On the differential equations defining the Laplacian distribution of density, pressure and acceleration of gravity in the earth,' PROFESSOR R. S. WOODWARD, Columbia University; (2) 'The theorems of oscillation of Sturm and Klein,' PROFESSOR MAXIME BÔCHER, Harvard University; (3) 'On some points in the theory of functions,' PROFESSOR A. S. CHESIN, Johns Hopkins University; (4) 'Point transformation in elliptic coördinates of circles having double

contact with a conic,' DR. EDGAR ODELL LOVETT, Princeton University; (5) 'Certain invariants of a plane quadrangle by projective transformation,' DR. EDGAR ODELL LOVETT, Princeton University.

##### *Afternoon Session.*

(6) Presidential address: 'The philosophy of hyperspace,' President SIMON NEWCOMB, Washington, D. C.; (7) 'Limits of transitivity of substitution groups,' DR. G. A. MILLER, Chicago, Ill.; (8) Some theorems in  $n$ -dimensional space,' MR. C. J. KEYSER, Columbia University; (9) 'The orthogonal group in a Galois field,' DR. L. E. DICKSON, University of California.

The Chicago Section of the Society will hold its second meeting on Thursday and Friday, December 30th and 31st, at Northwestern University, Evanston, Ill. Regular meetings of the Society will be held in New York on February 26th and April 30, 1898. The summer meeting will be held next year at Boston, Mass., in connection with the meeting of the American Association for the Advancement of Science.

The membership of the Society now exceeds 300. The November number of the *Bulletin* (Vol. VII., No. 2) contains, besides the 'Notes' and 'List of New Publications,' an account of the International Congress of Mathematicians held at Zürich last August; a report by the Secretary, Professor James McMahon, of the proceedings of Section A at the Detroit meeting of the American Association for the Advancement of Science; 'Quaternions as Numbers of Four Dimensional Space,' by Professor Arthur S. Hathaway; 'Note on the Invariants of  $n$  Points,' by Dr. Edgar Odell Lovett; 'Note on the Fundamental Theorem of Lie's Theory of Continuous Groups,' by Dr. Edgar Odell Lovett; 'A Geometrical Locus Connected with a System of Coaxial Circles,' by Professor Thomas F. Holgate; 'Condition that the Line Common to  $N-1$  Planes in an  $N$  Space may Pierce a Given Quadric Surface in the Same Space,' by Dr. Virgil Snyder, and a review of Lamb's *Hydrodynamics* by Professor Ernest W. Brown.

The December number of the *Bulletin* (Vol. VII., No. 3), which has just appeared, contains an account of the October meeting of the Society, by the Secretary; 'Note on Hyperel-