

as regards total digestible nutrients and starch equivalent the figures for sugarcane top silage are the lowest in the list.

Balance study for nitrogen, calcium and phosphorus was also made, the results being shown in Table III.

TABLE III

Nitrogen, calcium and phosphorus balances  
(in gm. per day)

	Kumauni bullock group (average of three animals)	Buffalo group (average of three animals)
Nitrogen (N) ..	+6.48	+13.02
Calcium (CaO) ..	+0.50	+ 4.88
Phosphorus (P <sub>2</sub> O <sub>5</sub> )	+1.87	+ 3.94

As is seen from the table, the balance for nitrogen is highly positive in both the groups. Calcium and phosphorus balances are also shown to be positive on an average.

It will be observed from the above data that ensilage of sugarcane tops will yield a fodder of high nutritive value and if recourse is taken to this method of conservation the entire surplus produce of sugarcane tops will be utilised and made available for scarcity periods, when there is a great dearth of nutritious and succulent fodder.

1. Kehar, N. D., and Sahai, B., *Science and Culture* (in press), 1949. 2. Paul, T. M., and Rangaswamy, M. C., *Ind. J. Vet. Sci. and Anim. Husb.*, 1947, 17, 48.

### THIRD SYMPOSIUM ON APPLIED MATHEMATICS—ELASTICITY

THE American Mathematical Society now holds annual Symposia on selected subjects in Applied Mathematics. The subject of the first symposium, held in August 1947, was Nonlinear Problems in Mechanics of Continua. In 1948 the subject of the second symposium was Electromagnetic Theory. Both these symposia are being published in book form.

The third annual symposium was held at the University of Michigan, Ann Arbor, Michigan, from the 14th of June to the 16th of June, 1949. The subject of the symposium was Elasticity. The Applied Mechanics division of the American Society of Mechanical Engineers was a co-sponsor of the symposium. The proceedings of this symposium are to be published in book form by McGraw-Hill.

This symposium was very well attended. On the second day about 300 mathematicians and engineers from all parts of the United States were present. There were seventeen invited papers and addresses. The Chief contributors included Sir Richard Southwell, Professor E. Reissner, Professor I. S. Sokolnikoff, Professor W. Prager, Professor D. L. Holl and Professor B. R. Seth. In the Applied Mechanics division Professor S. Woinowsky-Krieger, Mr. H. Poritsky, Professor D. C. Drucker and Professor L. H. Donnell were amongst the contributors.

Sir Richard Southwell showed how his relaxation method could be used for the elasto-plastic torsion problem. Professor E. Reissner, Professor F. B. Hildebrand and Professor K. O. Friedrichs dealt with finite deflection theory of plates and shells. Pro-

fessor I. S. Sokolnikoff gave an account of methods used to solve problems in anisotropic elasticity. He showed how the perturbation method could be used to get approximate results. Professor B. R. Seth pointed out that the method implied that the anisotropic elastic constants could be obtained from the isotropic ones by adding small terms, which was not always possible. Professor D. L. Holl discussed the bending of anisotropic plates under dynamic loads.

Professor W. Prager, Professor D. C. Drucker, Professor U. Coburn, and Mr. P. G. Hodge dealt with plastic problems. Professor B. R. Seth of Hindu College, Delhi, and at present Visiting Professor of Applied Mathematics at Iowa State College, discussed some recent applications of the theory of finite elastic deformations. He criticized some papers of P. M. Riz, U. Zvolinsky R. Kappus and R. S. Rivlin. His suggestion that in the non-linear elastic domain the elastic constants should be reduced was very well borne out by papers of E. A. Davis, A. Eyring and G. Halsey, an account of which was given by C. J. Thorne. It was suggested to Professor L. H. Donnell that if these reduced values of the constants were used the wide disagreement between theory and his experimental results on buckling of thin cylinders under axial compression would become much less. Professor B. R. Seth also pointed out to Professor G. E. Hay that, in his problem of the elliptic plate under concentrated load, the use of certain relations involving stress in orthogonal curvilinear co-ordinates would enable him to obtain the solution in a closed form.