one out of three from the Academic Council, out of a total of about 200 members in each.

ix. Considerable amount of canvassing is essential in all these elections and it should be an understanding among all officers of the Department to help in such canvassing. In addition to the personal manifestos of each candidate, a special Appeal may be sent, on his behalf, under representative signatures, or under the auspices of the M. A. S. U.

Correspondence with regard to these elections will be immense and may be entrusted to an energetic young man, resident at the Agricultural College Estate, who may be co-opted, if desired, as a member of the Committee of the M. A. S. U. for this purpose. All postage, stationery and printing charges incurred by him should be paid for by the selected candidates who seek election to the respective University Authorities and an advance of, say, Rs. 25 may be taken from each candidate. The S. I. T. U. levies a similar charge for all the candidates put up by them for election.

While I may not be able to do much canvassing, I shall always be glad to render all possible help towards securing adequate representation of Agricultural Education in all University Authorities.

It is also worth while trying to secure some of our representatives on the Andhra and Annamalai Universities.

Cheerio, Brother-Graduates.

EXTRACTS

A Labourer's Square Meal. The following Press Note has been issued from the Nutrition Research Laboratories, Coonoor.

A manual labourer needs at least two square meals a day. It is often impossible for him to return home to consume his midday meal and he naturally cannot afford to go and eat in a hotel. The meal, which he must perforce carry with him, should have the following qualities :—

(1) It should be sufficient in quantity and well balanced, i. e., contain the essential nutritive elements in correct proportions. (2) It should be cheap, made of easily available foods, and be simple to prepare. (3) It should be easy to carry, e. g., it should be solid to avoid the possibility of spilling, small in bulk, and not require a special utensil to contain it. (4) It should remain fresh and palatable for a number of hours.

Suitable "*missi chapatties*" may be made from the following :—

The constituents; whole wheat flour 10 ozs., Bengal gram flour 2½ ozs., onions ¾ oz., fenugreek leaves (or any other green leaves) ½ oz , milk 1 oz., ghee or butter ¼ oz. (except ghee) are mixed water being added and the whole kneaded into a dough. *Chapatties* are made from the dough in the ordinary way, good thick *chapatties* being recommended, since these remain fresh longer than thin ones. Subsequently, ghee is smeared on the *chapatties*. The weight of the whole meal is about 1 lb. It will supply about 1,300—1,400 calories, which is approximately half the daily requirement of a labourer, and about 50 grammes of protein.

The mixture is rich in vitamins and mineral salts. If fresh milk cannot be obtained, "*Khoa*" or skimmed milk powder can be used as an alternative. For those who can afford it, the addition of a greater quantity of milk, or an egg, to a dough may be recommended.

Such a meal is easy to carry folded in a broad leaf wrapped in paper. It remains fresh and palatable for a number of hours and can be eaten with no accessories except water. Its cost is about one anna. It can be recommended for travellers, picnic parties, etc., as well as for out-door labourers. (*The Mysore Economic Journal*, November 1937).

The World's Largest Plough. Several years ago, floods near Santana, California, buried fertile peat soil under several feet of silt and sand. Messrs. Post Bros. tractor rental service have since that time been building expressly designed and constructed ploughs to turn under the sand and bring the good soil back to the surface again.

The gigantic implement is their latest and largest example. Working 6 ft deep it is estimated that the plough is constantly turning and lifting 5 yds. of soil as it moves through a field. The hydraulic lift used to raise it out of work has a pressure of 750 lbs. per sq. in., and is operated from the immediate tractor.

With three "Caterpillar" track type tractors hitched to the plough, about ½ acre per hour can be covered. It is said that often the increased yields obtained from land so treated will pay in a single season for the cost of this aptly styled "super ploughing job". (*The Implement and Machinery Review*, October 1937).

Synthetic Silk from Milk. Mr. Benjamin Roos, forty-one years old German Chemist, now working in England, is trying to produce a perfect synthetic silk from milk. Already he has been ten years on his task, and has made silk from milk in his laboratories, silk of fine texture and colour. In 1931 Mr. Roos, who lives at Prince of Wales-terrace, Kensington W., sent Government analysts in Berlin a sample of real silk and a sample of his own invention. The analysts declared it was impossible to distinguish between them.

Mr. Roos is not satisfied. So far he has spent more than £ 25,000 in research work, and for years has kept laboratories going in four countries. But always the secret of combining in his product every quality of the finest silk has eluded him. He has set himself to obtain five essentials—beauty, colour, strength, elasticity and non-shrinkableness. At present he can combine up to any four of these qualities but the remaining point of perfection escapes in the process.

Silkworm Diets for Cows. Mr. Roos has now succeeded in a remarkable experiment. He is arranging for two cows to be fed for three weeks on mulberry leaves, which is the only diet of the silkworm. "I intend taking two cows in fine condition and have them left to pasture in the ordinary way for a week," he declared. "Then I will analyse their milk, the butter made from it, and the casein remaining in the skimmed milk. Casein is the raw material from which I make my synthetic silk. Next, the cows will have a proportion of mulberry fed them. The same tests will be carried out. Later I hope to feed them for three weeks almost entirely on mulberry leaves, again testing the results. If the cows fed on mulberry leaves produce casein which is more suitable for my silk than that from ordinarily fed cows I shall attempt to make a chemical analysis to establish the difference between the two caseins. If the chemical constituents of this difference are once ascertained it should be possible to improve the normal casein by manufacturing the difference in the laboratory".

His Experiment. Mr. Roos has already been offered the cows and the necessary equipment for his experiment, but he is still in need of mulberry

leaves. An average cow, every day it is milked, can produce enough casein to manufacture nearly 21 lbs 8 ozs, of synthetic silk. This is after butter has been made from the milk.

It takes more than 30,000 silkworms, who will eat a ton of ripe mulberry leaves to yield 12 lbs. of raw silk properly reeled. (*The Sunday Statesman*, 27 June 1937.) (*The Punjab Agricultural College Magazine* Vol. V. No. 1. October '37.)

Influence of fertilisation of Washington Navel Oranges on quality and composition of fruit. The report of trials on tbe above emphasizes through-out the importance of a balanced nutrient solution. In this connexion the general conclusion is that, although fundamentally one nutrient is as important as another, the most important two substances that have to be present in the correct proportion and in considerable quantities are nitrogen and phosphorus. The proportion and concentration should be such that considerable quantities of both substances would be absorbed and this would have the following effects:—

High Nitrogen : High crop ; low wastage.

High Phosphorus : Thin rind-high Juice (on whole fruit basis) ; low acid.

1. Fruit from all plots of all treatments were analysed for phosphorus, potassium, calcium, nitrogen, ash, dry weight, sugar, total soluble solids, acid, thickness of rind, and wastage due to mould.
2. A high phosphorus content in the fruit juice causes a low acid content. On the other hand, a high potassium content causes a high acid content.
3. A high phosphorus content in the fruit causes a thin rind and a low phosphorus content a thick rind.
4. High nitrogen content of fruit causes a low percentage wastage due to mould.
5. The juice content of the pulp has not been affected by any of the treatments although treatments have affected thickness of rind, which would accordingly be reflected in juice content when the latter is calculated on the weight of whole fruit, including the rind.
6. Nitrogen applications to the soil markedly depress the absorption of phosphorus into the fruit, unless large quantities of available phosphorus are present in the root zone. (*Farming in South Africa*, Vol. XII, No. 138, September '37).

Silica Dust as an Insecticide. Many substances used as insecticides are actual insect-poisons, but various non-poisonous materials in the form of very fine dust have also been tried at different times, their lethal effect being more of a physical nature. In a series of recent trials one of the most promising of these materials was a proprietary silica dust stated to consist of a pure quartz sand, ground to such a degree of fineness that the particles approach colloidal size, and to contain 98 per cent of silica, with only very small quantities of aluminium, iron, calcium, and magnesium compounds ("Versuche zur Bekampfung des kornkafers mit Staubmitteln" by B. Germar, *Z. Angew. Ent.*, 1936, 22. 603—630),

The practical trials were made with the granary weevil (*Calandra granaria*). It is believed that the fatal effect of the dust is due to a withdrawal of water from the tissues of the insect, owing to the large increase in body surface caused by the adherent dust. The effect of the dust is consequently dependent closely to the body of the insect, but the age of the insect is also a factor, the younger individuals being definitely more readily susceptible than the older. The temperature and the relative humidity of the atmosphere are also important.

The treated grain should contain 1 per cent by weight of the dust, which is best applied in the autumn or at the end of the winter, and should, of course, be stored in a dry place. The dust is non-toxic, and is removed by the usual processes preceding milling.

The treatment is said to be effective with regard to the existing weevil population, in retarding oviposition and hence preventing reinfestation, and to be economically practicable from the point of view of cost and ease of application. (*Bulletin of the Imperial Institute*, Vol. XXXV No. 3. 1937.)

Agricultural Jottings.

By THE DEPARTMENT OF AGRICULTURE, MADRAS

The Preservation of Cattle Manure. Cattle manure is collected and stored by cultivators, generally in an unsatisfactory manner. There is loss of manurial ingredients occurring in the manure heaps made by them and such losses could be easily avoided. When the cattle dung, waste fodder and other farm waste available are properly stored in pits day after day, there is fermentation taking place in the materials leading to their disintegration and when well made, the resulting material is rich, black in colour, uniform and powdery in appearance. When the manure is heaped in the open, the decomposition of the constituent materials is incomplete and a fair part of the heap is dried up and is in lumps. There is considerable aeration inside the heap and volatile poducts of decomposition, which are rich in nitrogen are lost. During rains, the heaps are soaked with water and the soluble portions of the manure rich in nitrogen are washed away and the cultivator is again a loser.

The preservation of the cattle manure can be done easily without much trouble or increased expenditure. It has to be borne in mind however that both dung and urine of cattle contain valuable manurial ingredients and have to be collected without allowing any to be wasted. The losses in the making of the manure are minimised by collecting the manure in pits, preferably provided with impermeable sides and flooring, and a roofing to guard against rain and sun. The sides of the pit should be raised over the ground level, to prevent rain water from the surrounding areas getting into the pit. All available organic wastes can be added to the manure pit. The manure in the pit has to be levelled once a fortnight and covered with a thin layer of earth, preferably tank silt. These help to increase the bulk of the manure. The silt helps to fix the volatile gases resulting from the fermentation of the manure and prevents loss of valuable manurial ingredients.

There are a few systems of stalling the animals and collecting and preserving manure that are satisfactory. The cattle shed may be provided with an impermeable flooring to permit urine being collected and led to the manure pit by means of suitable drains. The sheds can be washed every day and the washings also led into the manure pit. This is called the 'Byre System'. The byre or the cattle shed can be kept clean and tidy and is therefore pre-eminently suitable for housing cows and calves in particular.

It is not necessary to have pucca flooring for all classes of cattle. The working animals can be stalled in what is known as a loose-box, which is a combination of a cattle shed and manure pit requiring very little attention. Pits are dug to a depth of 2½ to 3 feet sufficiently large to house the animals and the entrance is made lightly sloping to permit the cattle to get in and get out easily. A feeding trough may be built on one side or a movable manger put in. The waste fodder and waste products of the farm like dried leaves, may be spread on the floor to absorb the urine voided by the animals and to provide them bedding. The dung dropped by the cattle may be spread evenly over the floor every morning and a layer of waste spread over it. The manure obtained from the loose box is very rich. Animals have been stalled in loose boxes in the various agricultural stations for the past 30 years and over and their health has not been affected.