ABSTRACTS OF COMMUNICATIONS

The Sixty-fifth Meeting of The Nutrition Society (Thirtieth of the Scottish Group) was held at Strathcona House, Rowett Research Institute, Bucksburn, Aberdeenshire, on Saturday, 10 February 1951, at 2.15 p.m., when the following papers were read:

Effects of Cobalt Deficiency on Appetite.

By J. STEWART, *Moredun Institute, Gilmerton, Edinburgh*

The Haemoglobin Concentration in the Blood of Male and Female Students.

By J. BECK and MARY WISHART (introduced by R. C. GARRY), *Institute of Physiology, University of Glasgow*

A marked difference between the haemoglobin concentrations in the blood of men and of women is accepted as 'normal'. Provided the environmental influences on the two sexes are similar then three possible explanations of this difference are (1) influence of an intrinsic endocrine factor; (2) a relatively greater plasma volume in the female; (3) inadequate iron intake by women to compensate for iron loss.

Table 1

Survey	Sex	No.	Mean Hb (g./100 ml.)	S.D.	S.E.M.
1949	M.	24	15·92	1·11	0·23
	F.	41	14·02	0·86	0·13
1950	M.	53	15·62	1·01	0·14
	F.	55	13·61	0·95	0·13

It is difficult to find groups of men and women which do not differ widely in their nutrition, environment and activity. In an attempt to eliminate such extrinsic influences, two surveys were carried out on men and women students at the same stage of their undergraduate career. They formed a 'population' where the environmental influences were practically identical. The majority were medical students in the 2nd year of their course, and their ages ranged from 18 to 23. The results are given in Table 1. The first survey was carried out in October–November 1949, the haemoglobin concentrations being determined visually by a Keeler grey wedge photometer. In the second survey in October–November 1950, the determinations were made photoelectrically with a Spekker absorptiometer.

The Stature of University Students and their Parents. By J. V. G. A. DURNIN and J. B. DE V. WEIR (introduced by R. C. GARRY), *Institute of Physiology, University of Glasgow*

At the last meeting of the Scottish Group of The Nutrition Society it was shown that present-day children are growing faster than those of earlier generations. A matter of some interest is whether as a result of their faster growth their adult stature is also increased or merely earlier attained. At the meeting, on the suggestion of Dr B. Woolf, the audience were asked if they were taller or shorter than their respective parents and a show of hands indicated that they were taller.

As a follow-up, the heights of students attending the Physiology class at Glasgow University were compared with those of their parents. The students (sixty-three females and 184 males) were measured in the Department and were given precise printed instructions for measuring their parents at home. The results showed that 76·2% of the women students were taller than their mothers and 73·9% of the men taller than their fathers. The differences of these percentages from the expected 50% on a null hypothesis are highly significant. The mean height of the women students was $64{\cdot}37 \pm 0{\cdot}25$* in. and of their mothers $62{\cdot}73 \pm 0{\cdot}27$ in., a difference of 1·64 in. The mean height of the men students was $69{\cdot}08 \pm 0{\cdot}19$ in. and of their fathers $67{\cdot}31 \pm 0{\cdot}20$ in., a difference of 1·77 in. It is difficult to accept with Morant (1950) that these differences are due to a real decrease in the heights of the parents.

REFERENCE

Morant, G. M. (1950). *Nature, Lond.*, **165**, 953.

* Standard error of the mean.

Experimental Muscular Dystrophy in Young Calves. By K. L. BLAXTER (in Receipt of a Senior Award of the Agricultural Research Council), P. S. WATTS* and W. A. WOOD, *The Hannah Dairy Research Institute, Kirkhill, Ayr*

Deaths in calves, 2–3 months old, due to heart failure and to muscular dystrophy have been studied. Four pairs of calves were given rations, containing dried skim milk powder, lard, and vitamins A and D in arachis oil. A further four pairs received identical diets, save that vitamins A and D were supplied as veterinary cod-liver oil. One animal of each of the eight pairs received 50 mg. racemic α-tocopheryl acetate daily. Dystrophy developed in those calves receiving the arachis oil diet without α-tocopherol, but not in those given this diet with the α-tocopherol. It occurred in both groups given cod-liver oil, the incidence being greater and the lesions more severe in those which did not receive α-tocopherol. Dystrophic musculature was associated with abnormalities of gait and behaviour. In mild cases body-weight gain and nitrogen metabolism were but slightly affected. In severe cases there was an elevation of the basal metabolic rate and an increase in the elimination of creatine in the urine. Brain oedema and slight gliosis of the spinal cord suggested a nervous involvement. Ausculta-

* Now at the Institute of Veterinary and Medical Science, Adelaide.

tion and electrocardiography showed cardiac involvement. At post-mortem examination the dystrophy was found to be bilaterally symmetrical, and degeneration of muscle cells with proliferation of sarcolemmal elements was demonstrated histologically. Water, ash, fat, cholesterol, and distributions of nitrogen and phosphorus were determined in the muscle.

Observations on Diet during First Pregnancies in Aberdeen. By A. M. THOMSON, *Department of Obstetrics, University of Aberdeen*

Reproduction in the Mouse as Affected by Additions of Calcium Carbonate to the Diet. By MARION B. RICHARDS, *Rowett Research Institute, Bucksburn, Aberdeenshire*

In a breeding test on mice, using the method of continuous monogamous mating, three levels of calcium carbonate—0·5, 1·0 and 2·0%—were added to the B diet of Sherman and to three modifications of it. The Ca content of the basal diets was 0·34% and the Ca : P ratio approximately 0·7. On all the diets the highest addition of calcium carbonate, which gave a Ca intake of 1·1% and a Ca : P ratio of approximately 2·3, significantly lowered the number and total weight of young weaned, and increased the number and proportion of deaths. Post-mortem examination of the weanlings showed the presence of pale speckled livers, enlarged hearts and small thymus glands in the groups receiving the higher amounts of calcium carbonate.

When supplements of iron citrate, sodium acid phosphate or calcium dihydrogen phosphate were added to the diet, a number of failures to rear litters occurred in the high-Ca groups, but in the litters which were reared the weaning weight seemed to be favourably affected by addition of iron or by reduction of the Ca : P ratio. The heart weights of the weanlings were significantly increased by Ca and decreased by iron, while thymus weights were diminished by Ca and increased by iron.

The Blood and Liver of the Mouse as Affected by Additions of Calcium Carbonate to the Diet. By W. A. GREIG, *Rowett Research Institute, Bucksburn, Aberdeenshire*

Weanling litters from young adult female mice fed on modifications of the B diet of Sherman with an addition of up to 2% calcium carbonate exhibited marked anaemia; the mothers themselves also developed anaemia, but to a milder degree. The anaemia appeared to be of iron-deficiency type in every respect except that the mean cell volume was not clearly reduced; an attempt to explain this anomaly has been made on the basis of the peculiarly large number of immature red cells normally found in mouse blood. A remarkably close correlation was found to exist between blood haemoglobin and heart weight, especially in the weanlings. Other features noted in the weanlings included increased subcutaneous fatty deposits, hyperlipaemia, and marked fatty infiltration of the liver.

Further supplementation of the diet with ferric citrate partially or completely prevented these effects, but the addition of sodium acid phosphate did not do so to any significant extent; the addition of an equivalent amount of calcium as calcium dihydrogen phosphate, however, appeared to be less injurious than the addition of calcium carbonate.

Some Effects of Supplementary Feeding of Scottish Blackface Ewes and their Lambs. By J. W. HOWIE, *Rowett Research Institute, Bucksburn, Aberdeenshire*

The Use of Chromium Oxide to Measure the Apparent Digestibility of Carotene in Goats and Cows. By R. CHANDA, HELEN M. CLAPHAM, MARY L. MCNAUGHT and E. C. OWEN, *Hannah Dairy Research Institute, Kirkhill, Ayr*

The digestibility of carotene in dried grass was measured by the Cr_2O_3 method in both cows and goats. In the goats the direct method was simultaneously used for comparison with the Cr_2O_3 method. By the direct method digestibilities of carotene in four goats were 68·4, 63·0, 62·2 and 61·6%. The corresponding digestibilities obtained from the same faeces samples by the Cr_2O_3 method (Edin, 1918), after correction as suggested by Kreula (1947), were 67·4, 63·5, 62·4 and 61·4%. In six cows on a diet similar to that of the goats the Cr_2O_3 method showed 59·3, 54·0, 54·4, 54·4, 57·1 and 55·5% carotene to be apparently digested.

It was shown statistically that fewer animals for a longer time gave a more reliable result than more animals for a shorter time.

The use of the method to demonstrate the effects of thyroxine and thiouracil on the digestibility of carotene (Chanda, McNaught & Owen, 1951) was described. A detailed account of this work is in the press (Chanda, Clapham, McNaught & Owen (1951).

REFERENCES

Chanda, R., Clapham, H. M., McNaught, M. L. & Owen, E. C. (1951). (In the Press.)
Chanda, R., McNaught, M. L. & Owen, E. C. (1951). *Biochem. J.* **48**, xli.
Edin, H. (1918). *Medd. CentAnst. Försöksv. Jordbr., Stockh.*, no. 105.
Kreula, M. S. (1947). *Biochem. J.* **41**, 269.

The Response of Dairy Herds to a Single Dose of Copper. By G. DUNLOP, *Auchincruive, Ayr*

Some forty farmers are co-operating with The West of Scotland Agricultural College in an investigation on the nutritional adequacy of rations fed to dairy herds. Altogether 2500 cows are on experiment. Feeding-stuff firms, mineral-lick manufacturers and vitamin suppliers are assisting in the work.

Following the addition of 10 g. copper sulphate to an evening concentrate allowance 24 hr.–10 days before the visit of the milk recorder, positive responses in butterfat production have been obtained in herds fed rations supplied, or contributed to, by National feeding-stuff firms and mineral-lick manufacturers. Responses have been observed in certain cows in herds averaging over 4% butterfat. The low fat percentage in the milk of certain animals in a herd exhibiting cows at the London Dairy Show has been shown to be due to deficiency of copper. No response has been elicited in less intensively farmed districts where the herds are fed the local feeding-stuff merchant's rations or the farmer's own dairy mixtures which do not include trace elements.