

# Lincoln College

CANTERBURY AGRICULTURAL COLLEGE

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## RURAL EDUCATION BULLETIN

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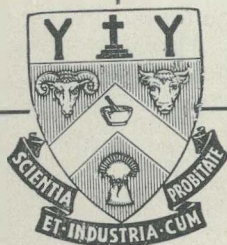
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SCHOOL OF AGRICULTURE  
UNIVERSITY OF NEW ZEALAND

# MEAT FOR BRITAIN

## HEAVY-WEIGHT OR LIGHT-WEIGHT FAT LAMBS

A. H. Flay, Associate Professor of Farm Management

Britain needs more meat. New Zealand is a livestock country and an important producer of meat. Almost the whole of our export meat goes to Britain, but are we shipping as much as we might? At present prices, meat production is a payable undertaking with New Zealand farmers, who are encouraged to produce light-weight lambs for the British market. The price schedule in the past has been designed to encourage light weights and the first prize for New Zealand lamb at Smithfield always goes to light-weight lambs. At the Royal Agricultural Society's Show at Cambridge, England, held in July, 1951, the first prize went to fat lambs dressing at 60-65 lb. They were a nice trio of Suffolk cross-breds 24 weeks old.

Who were the judges at the Royal Agricultural Society's Show? And who were the judges at Smithfield? Have these judges different standards or frameworks within which they must work? If so, who decides or sets up these standards? What is the position in these matters? Can both be correct?

One fact stands out; that in the one case light-weight lambs are deemed the best and in the other, heavy weights are given first place. It cannot be argued that the flesh of the heavier lamb is inferior to that of the immature. On the contrary most folk would prefer the more mature sheep.

The British farmer is encouraged to produce the greatest possible quantity of meat. This he does by producing a well-grown heavy lamb of 60-65 lb. In New Zealand it would take almost two ewes to produce this quantity of lamb meat. Certainly his breed of sheep, his farm management and feed supply are organised to produce such heavy-weight lambs profitably. In New Zealand we are encouraged and are somewhat organised to produce light-weight lambs. We keep one ewe for one year to produce a 32 or 36 lb. lamb. There is no doubt that in some districts and in some seasons we are indeed very grateful to be able to kill even 28 lb. lambs, but also there are many districts and seasons in which lambs could readily be made heavier. Also it would be very easy by the use of heavier-type rams and by very slight modification in farm management to produce in many districts in New Zealand not just 40 or 45 lb. lambs but 55 and 60 lb. as the English judges suggest and as the British consumer at present almost desperately requests.

We know it is suggested that in the long run the light-weight lamb is what the British consumer will desire. It can perhaps be agreed that the Londoner, that is the older Londoner who, prior to 1938, enjoyed the small joint, still would like it. We could go further and say, perhaps, that the older folk in other parts of England would like a small joint, but all this assumes an adequate supply of meat, or a cessation of subsidies and a free market enabling only those with adequate means to purchase complete joints. The younger generation (and some of these have had cut joints and inadequate meat for 12 years of married life) have scarcely experienced or enjoyed a full joint on the table. They want meat for themselves and their growing children. They are used to a cut joint. Unquestionably in the short run the Royal Show judges are correct. The people of Britain need more meat. Why can't we endeavour to meet their incessant requests by selling them the maximum quality of meat our feed supply and sheep breeds will permit—even if in the long run it should be necessary to produce a small joint, as one school of thought believes? But it is no use arguing that today the British consumer must have a complete joint for the family table. There is just not sufficient meat for this, and even the small joint is cut into two or more pieces and the larger English joint into three or more pieces. After ten or twelve years of dissected joints a new custom and habit has been developed. There are many homes in Britain today where the entire family has experienced no other than a part-joint or cut-joint roast.

Also it must not be overlooked that the eating habits of the British consumer have undergone a great change in recent years. There is much eating at restaurants, hotels, cafes, and snack bars. Further, hot mid-day meals at schools for school children are now the usual practice and are prepared by caterers. For these new eating habits, large joints are required. Both the cut joint at home and the eating-out practice are new habits. Customs and habits, even though developed under conditions of sheer necessity, once established, change slowly. For some 12 years now the English consumer has had insufficient meat and there is most certainly no likelihood of there being supplied to Britain an adequate meat supply for many years yet—perhaps 10 or 15 years or longer. Have our kinsfolk in Britain to go on shorter rations than they need for this further period just because in the **long run** it is thought that light-weight lamb will some day again sell best in Britain? Are we so helpless in our farm-management methods in New Zealand that we cannot produce heavy-weight lambs, as heavy as the sheep breeds we choose to carry and the feed we care to produce

will permit economically? Can we not use heavy-weight fat-lamb sires to the maximum that these are available and, if necessary, change back over a year or two to the light-weight?

Have we thought what the effect on the production of heavy-weight lamb in New Zealand might be if the same price we paid for a given grade for all lambs killing up to 45 lb. and  $\frac{1}{2}$ d. per lb. more were paid for those killing 45-60 lb?

An extra 10 lb. of meat per lamb with an export of 11,000,000 lambs would give 50,000 tons more meat, 10 times the trial shipment suggested for North America. It would be very easy to achieve this in New Zealand and it is pleasing to note that this season's favourable feed supply is giving some considerable help in this direction.

It is recognised that there are two schools of thought in this matter and it may be that, in the long run, the small joint will be the only meat product that Britain will import, but the thought is put forward that the long run can be a very long time sometimes in arriving. Might it not be better to encourage New Zealand farmers meanwhile to produce maximum quantities of meat compatible with their farm-management policies and methods? Britain needs the meat and New Zealand farmers can well produce a greater tonnage. They only need the encouragement. A price schedule favouring heavy weights would be practical encouragement.

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## FOOT AND MOUTH DISEASE

(Reprinted from the Canterbury Chamber of Commerce  
Agricultural Bulletin No. 274)

In recent months great interest has been shown concerning Foot and Mouth disease. Almost daily the newspapers have contained references to the trouble and its repercussions. They describe the fumigation of overseas aeroplanes and how immigrants from places like Holland are thoroughly "vetted" on arrival and made to land with only one set of footwear. They mention also the catastrophic number of animals affected in the countries of Western Europe.

Why is everyone so anxious to keep this disease away from New Zealand? Since it is not a killing disease, why should we worry? It may not kill, but we would certainly be more than worried if it arrived here. It is so very infectious and spreads so rapidly that in a short time, if left unchecked, it would travel far. Both wild and domestic animals in New Zealand would help spread Foot and Mouth disease and probably human beings would help just as much.

In Holland last year four outbreaks were recorded in June, 29 in July, 27 in August, 279 in September, 3,318 in October and over 11,000 in November. In England, where the drastic slaughter-method of control is practised, 120 outbreaks have led to the slaughter of over 12,000 head of livestock since November of last year. Typical of what can happen in a small area is shown by the outbreak which occurred near Bath, England, in 1943. From July 11th to September 28th 4,047 cattle, 1,003 sheep, 1,574 pigs and 11 goats were slaughtered in the effort to control the outbreak. These figures show how infective and easily spread this disease can be. It is obvious that if no preventive measures are taken, a nation's cattle population is in peril of being affected.

An infected cow goes completely off her milk and may never come back into milk fully again.

You can well imagine the blow it would be to New Zealand's £60,000,000 a year dairy industry if we had the disease. To make matters worse, infected cows frequently abort or give birth to dead calves. How would we replace these losses? Some cows recover from the disease but remain chronic invalids. If Foot and Mouth disease reached New Zealand and we resorted to a slaughter policy, we would have to destroy great numbers of our animals before we gained control.

Foot and Mouth has been recognised as a specific disease for a long time and there are records of it occurring in Germany and France in the middle of the 18th century. In Britain it was first described in 1839 and it has occurred there spasmodically from that year to this. Few countries have escaped. Australia and New Zealand are fortunate in that they have remained free. The United States and Canada have been comparatively free in the past, but now Canada is experiencing an outbreak. In this case it is alleged that a Dutch immigrant was the carrier. The United States of America also is threatened with the disease from across the borders of Mexico. There the disease broke out in 1946 and was allegedly caused by the importation of Zebu cattle from Brazil. It soon spread until vast numbers of animals were affected. The United States, realising the danger to herself, offered the Mexican Government the aid of her laboratories and livestock officers. The two countries combined in a campaign to stop the spread and during the first six months of 1949 some 18,000,000 vaccinations had been completed. At that time no outbreaks had occurred amongst vaccinated animals. Europe, Asia, and Africa all have Foot and Mouth disease and until something is done on an inter-

national level they will keep on experiencing recurrent epizootics. South America has had the disease for years.

The disease is caused by one of the smallest viruses known to man. There are three known types and in each type there are a number of variations. This complicates the work of making a vaccine to cope with the trouble. Cloven-hoofed animals are usually the victims and in countries where the disease is always present, "carrier" animals cause recurrent outbreaks. Human beings can carry the virus very successfully, for it can remain alive on leather and gumboots for as long as 80 days. Man can also be affected with the disease. Common farmyard creatures such as cats, dogs, hedgehogs and birds all have at one time or another been blamed for the spread.

In England and other places where the disease occurs sporadically, there are several ways in which the virus is thought to be spread. Some years ago it was popular to blame starlings resting during their migratory flights from Western Europe. This was suspected because of the number of outbreaks occurring in cattle while out at grass. The importation of diseased animals is a constant danger and was the main source of infection in England during the last half of the 19th century. When importations from infected areas were prohibited the number of attacks was reduced. During the last war most of the outbreaks in Great Britain resulted from the importation of meat from South America and the subsequent feeding of scraps and bones to pigs. There are several reasons for believing this. At the Pirbright Research Institute (Animal Virus Diseases) in England it was shown that the virus can live in frozen bone marrow for 76 days. In a series of 93 outbreaks in Britain during 1944, 78 cases commenced among pigs. The virus type found in these outbreaks was similar to that in South America. Finally it was noticed that in areas where no imported meat was received there were no outbreaks of the disease.

Animals coming in contact with the virus develop the disease in two or three days. Its presence is shown by the animals suddenly going off their feed and running high temperatures. Soon blisters appear on the tongue and lining of the mouth and on the soft areas between the hooves. This causes the animals to salivate profusely and to become lame, thus giving rise to the name Foot and Mouth disease. Milk secretion ceases and mastitis may follow. Some cows abort and lose condition. Affected calves usually die. In pigs the blisters appear on the snout and feet and in some cases the hooves may be shed. If left alone 99 per cent. of affected animals would probably recover in 10 to 14 days. Complete

recovery would not be the rule for many would later suffer from pneumonia or from affected joints. Others would become carriers and remain as a source of infection for future outbreaks.

So great are the losses resulting from Foot and Mouth disease that some attempt at dealing with it must be made. Firstly there is the drastic slaughter policy as is carried out in Great Britain, the United States, and Canada. When the disease is confirmed on a farm, it is completely isolated. Policemen prevent unauthorised entry to the property and all cloven-hoofed animals within a 15-mile radius of the farm are "confined to barracks." No movement in or out of the area is allowed. All affected cloven-hoofed animals and those which have been in contact with them are valued for compensation purposes and then slaughtered. The carcasses are either burnt or buried in lime. Sometimes the contacts are salvaged for human consumption. Following the slaughter, the farm buildings are disinfected as thoroughly as possible. All loose hay is burnt. Manure is sprayed with disinfectant or put in heaps so that the generated heat kills the virus. The whole farm is then left clear of livestock for six weeks.

Many people do not agree with the slaughter policy and would like to use other ways of controlling the disease. Dr. Ian Galloway, Director of the Pirbright Research Institute, writes in support of the slaughter policy in the *Farmers' Weekly*. He states that from November 14th to December 31st, 1951, the number of outbreaks in England was 87, the slaughter policy having been carried out; with no slaughtering, the number of confirmed cases in Western Germany from November 1st to November 14th reached 54,000. Also, in the years 1922 to 1926 there were 4,973 outbreaks in Great Britain and 101,852 outbreaks in France. This suggests that the slaughter policy is a quicker method of control and that the total loss entailed is less than with other methods of combating the disease. In fairness to the continental countries it must be pointed out that Great Britain is in a favoured geographical position to carry out the slaughter policy. Other countries, finding the slaughter policy too costly or difficult to carry out, have reverted to other means of control. They first of all tried treatment with both convalescent and hyper-immune serum and later used vaccines. The vaccines seemed to give an immunity against the particular virus for about six months. It was soon found that an animal vaccinated with one type of the virus was not protected against the other types, and so vaccination was not of great value. Owing to technical diffi-

culties it has not been found possible to manufacture a combined vaccine which would protect against all strains.

What then of the future? It would appear that Foot and Mouth disease will continue to menace many lands until it can be combated at an international level. Steps in this direction have already been taken. The United States and Mexico are working together to eliminate the disease in Mexico. In May, 1950, the Food and Agricultural Organisation of the United Nations recommended that an international centre be established for the examination of the types of virus and maintenance of strains. It was decided that this centre should be located at Pirbright, England, and that funds should be made available from international sources.

New Zealand has an efficient quarantine scheme in operation and every care is taken to guard against the disease entering the country with imported livestock. With fast air travel there is, of course, the possibility of the virus coming in from affected countries. From all accounts, however, the authorities are wide awake to the possibility and are taking active steps to prevent such a catastrophe.

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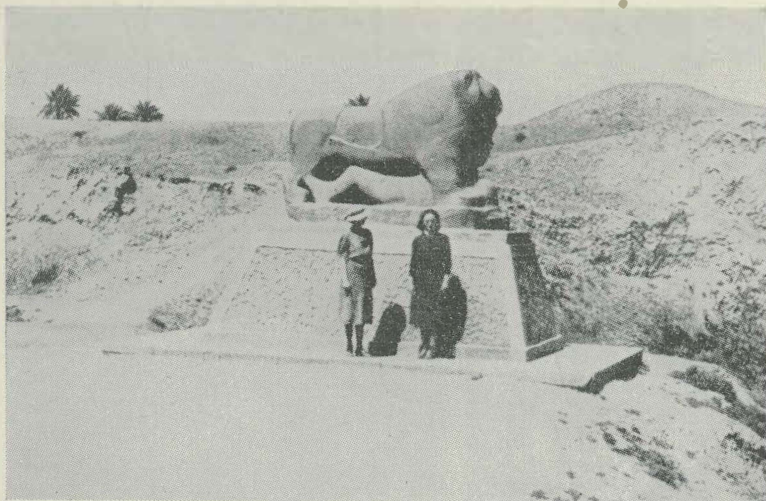
## CONQUEST OF THE LAND THROUGH SEVEN THOUSAND YEARS

(Continued)

W. C. Lowdermilk

Mesopotamia, the traditional site of the Garden of Eden, out of which come the stories of the Flood, of Noah and the Ark, of the "Tower of Babel" and the confusion of tongues, of the fiery furnace which we found still burning today, is jotted full of records of a glorious past, of dense populations and of great cities that are now ruins and desolation. For at least eleven empires have risen and fallen in this tragic land in 7000 years. It is a story of a precarious agriculture by people who lived and grew up under the threat of raids and invasions from the denizens of grasslands and the desert, and of the failure of their irrigation canals because of silt—silt!

In recent years a great pool of oil was discovered beneath the traditional Garden of Eden. It was escaping gas from this pool that caught fire and became known as the fiery furnace into which, presumably, the three friends of Daniel, Shadrach, Meschech, and Abednego, were thrown by an angry King. Income from this rich find of petroleum may well be used to restore this ancient land to more than its former productivity by installations of modern civilisa-



“The Lion of Babylon”—the only remaining statue in all the heaps and piles of wreckage which were once the mighty Babylon.

tion. Scarcely a beginning in this possible reclamation has been made.

In Mesopotamia, agriculture was practised in a very dry climate on canal irrigation with muddy water. Waters of the Twin Rivers are now heavily charged with the products of erosion out of far mountain gorges and overgrazed hill lands, of the Tigris and Euphrates drainage. This muddy water was the undoing of empire after empire by reason of silt. As muddy river waters slowed down, they choked up the canals with silt. It was necessary to keep this silt out of the canals year after year to supply life-giving waters to farm lands and to cities of the plain. As populations grew, canals were dug further and further from the rivers, until a great system of canals called for a great force of hand labour to keep them clean of silt. This was a very serious problem, and the rulers of Babylon brought in war captives for this task. Now we understand why the captive Israelites “sat down by the waters of Babylon and wept,” for they also were doubtless required to dig silt out of canals of Mesopotamia.

As these great public works of cleaning silt out of canals were interrupted from time to time by internal revolutions and by foreign invaders, the peoples of Mesopotamia were brought face to face with disaster in canals choked with silt. Stoppage of canals by silt depopulated villages and cities more effectively than the slaughter of people by an invading army.

On the basis of an estimate that it was possible in times past to irrigate 21,000 square miles of the 35,000 square miles of the alluvium of Mesopotamia, the population of Mesopotamia at its zenith was probably between 17 and 25 million. The present population of all Iraq is estimated to be about 4,000,000, including nomadic peoples. Of this total not more than 3,500,000 live on the alluvial plain.

Decline in population in Mesopotamia is not due to loss of soil by erosion; for the fertile lands are still in place and life-giving waters still flow in the Tigris and Euphrates Rivers, ready to be spread upon the lands today as in times past. Mesopotamia is capable of supporting as great a population as it ever did and greater when modern engineering makes use of reinforced concrete construction for irrigation works and powered machinery to keep canal systems open. A greater part of Mesopotamia thus might be farmed than ever before in the long history of this tragic land. But erosion in the hinterlands aggravated the silt problem in waters of the Twin Rivers as they were drawn off into the ancient canal systems, and invasions of nomads out of the grasslands and the desert brought about the breakdown of irrigation that spelled disaster after disaster.

We shall leave Mesopotamia now where at least 11 empires rose and fell in the past 7000 years and where the twelfth nation of Iraq is now just beginning a new life. We shall travel westward across the Syrian desert, along the probable route of the patriarch Abraham with his family, as he journeyed from Ur of the Chaldees to the Promised Land of Canaan. We had selected for our survey of Mesopotamia a period that would fall after the usual spring rains and before the sandstorms of late spring. But we were overtaken by a belated rain and became stuck in the mud. We owe our rescue to the kindness and efficiency of employees of the Iraq Petroleum Pipe Line Company which was engaged in pumping oil out of the great pool under the Garden of Eden to the Mediterranean Coast, in two pipe lines each more than 600 miles long.

## IN EGYPT'S LAND

Let's now turn to the other great centre of population growth and development of civilisation in the Valley of the Nile, where the mysterious Sphinx ponders problems of the ages as he looks out over the narrow green valley of the Nile lying across a brown and sun-scorched desert.

In Egypt as well as in Mesopotamia tillers of soil early learned to sow food plants of wheat and barley and

to grow surplus food that released their fellows for divisions of labour that gave rise to the remarkable civilisation that arose in the Valley of the Nile. Our debt to the ancient Egyptians is great.

Here farming grew up with flood irrigation of muddy water where problems of farming were quite different from those of Mesopotamia. Annual flooding with silt-laden waters spread thin layers of silt over the land, raising it higher and higher. In these flat lands of slowly accumulating soil, farmers never met with problems of soil erosion. To be sure, there have been problems, especially since year-long irrigation has been made possible by the Assuan Dam, of salt accumulation and of rising water tables for which drainage is the solution. But the body of the soil has remained suitable for cropping for 6000 years and more.

It was perhaps in the Nile Valley that a genius of a farmer about 6000 years ago hitched an ox to a hoe and invented the plough, thus originating power-farming to disturb the social structure of those times much as the tractor disturbed the social structure of our country in recent years. By this means farmers became more efficient in growing food; a single farmer released several of his fellows from the vital task of growing food for other tasks. Very likely the Pharaohs had difficulty in keeping this surplus population sufficiently occupied; for we suspect that the Pyramids were the first great W.P.A. projects.

## ON THE TRAIL OF THE ISRAELITES

We shall follow the route of Moses out of the fertile irrigated lands of Egypt into a mountainous land where forests and fields were watered with the rain of heaven. Fields cleared on mountain slopes presented a new problem in farming—the problem of soil erosion, which as we shall see, became the greatest hazard to permanent agriculture and an insidious enemy of civilisation.

We crossed the modern Suez Canal with its weird colour of blue, now a very important "big ditch," into Sinai where the Israelites with their herds wandered for 40 years. They or someone must have overgrazed the Peninsula of Sinai, for it is now a picture of desolation. We saw in this landscape how the original brown soil mantle was eroded into enormous gullies as shown by great yellowish gashes cut into the brown soil-covering. I had not expected to find evidences of so much accelerated erosion in the arid land of Sinai.

On the way to Aqaba we crossed a remarkable landscape, a plateau that had been eroded through the ages

almost to a plain, called a peneplain in physiographic language. This broad flat surface glistened in the sunlight with the colours of the rainbow because of desert varnish on the small stones that had been fitted together through the ages to form a classic example of desert pavement. This peneplain surface dates back to Miocene times, in the geological scale. In the plain now is no evidence of accelerated cutting by torrential streams, no evidence that climate had changed for drier or wetter conditions since Miocene times. Here is a cumulative record going far back of the Ice Age, proclaiming that in this region climate has been remarkably stable.

From this plateau we dropped down 2500 feet into the Araba or gorge of the great rift valley that includes the Gulf of Aqaba, the Araba, the Dead Sea, and the Valley of the Jordan. At the head of the Gulf of Aqaba of the Red Sea we found Dr. Nelson Glueck excavating Ezion Geber which he calls the ancient Pittsburg of the Red Sea, or Solomon's Seaport, where copper was smelted 2800 years ago to furnish instruments for Solomon and his people. The mud brick used for building these ancient houses looked just like our adobe brick of New Mexico and Arizona.

As we climbed out of the rift valley over the east wall to the plateau of Trans-Jordan that slopes toward the Arabian Desert, we came near Amman upon the same type of peneplain that we crossed west of the Araba. This peneplain was covered by a coarser pavement in which were fragments of basalt, but topographically these two plains are parts of the same peneplain that once spread unbroken across this region. But toward the end of Pliocene times—that is, just before the beginning of the Ice Age—a series of parallel faults let down into it the great rift valley to form one of the most spectacular examples of disturbances in the earth's crust that is known to geologists.

From Ma'an we proceeded past an old Roman dam, silted up and later washed out and left isolated as a meaningless wall, and on to Elji where we took horses to visit the fantastic ruins of ancient Petra (called Sela in the Old Testament). This much-discussed city was the capital of the Nabatean civilisation and flourished at the same time as the Golden Age of China—200 B.C. to 200 A.D. Rose-red ruins of a great city are hidden away in a desert gorge on the margin of the Arabian desert.

Petra is now the desolate ruin of a great centre of power and culture and has been used by some students as evidence that climate has become drier in the past 2000

years, making it impossible for this land to support as great a population as it did in the past. In contradiction to this conclusion, we found slopes of surrounding valleys covered with terrace walls that had fallen into ruin and allowed the soils to be washed off to bare rock over large areas. These evidences showed that formerly food was grown locally and that soil erosion had damaged the land beyond use for crops. Invasion of nomads out of the desert had probably resulted in a breakdown in these measures for the conservation of soil and water, and erosion had washed away the soils from the slopes and undermined the carrying capacity of this land for a human population. Before ascribing decadence of the region to change of climate, we must know how much the breakdown of intensive agriculture contributed to the fall and disappearance of this Nabatean civilisation.

The great buildings used for public purposes are amazing; temples, administrative buildings, and tombs are all carved out of the red Nubian sandstone cliffs. A fascinating story still lies hidden in the unexcavated ruins of this ancient capital. The influence of Greek and Roman civilisation was found in a great theatre with a capacity to seat some 2500 persons, carved entirely out of massive sandstone rock, which only echoes the scream of eagles, or the chatter of tourists.

And as we proceeded northward in the Biblical land of Moab, we came to the site of Mt. Nebo and were reminded of how Moses, after having led the Israelites through 40 years of wandering in the wilderness, stood on this mountain and looked across the Jordan Valley to the Promised Land. He described it to his followers in words like these:

“For the Lord thy God bringeth thee into a good land, a land of brooks, of water, of fountains and depths that spring out of valleys and hills; a land of wheat and barley and vines and fig trees and pomegranates, a land of olive oil and honey; a land wherein thou shalt eat bread without scarceness; thou shalt not lack anything in it; a land whose stones are iron and out of whose hills thou mayest dig brass.”

## THE LAND OF MILK AND HONEY

We crossed the Jordan Valley as did Joshua and found the Jordan River a muddy and disappointing stream. We stopped at the ruins of Jericho and dug out kernels of charred grain which the archaeologists tell us undoubtedly belonged to an ancient household of this ill-fated city. We looked at the Promised Land as it is today, 3000 years

after Moses described it to the Israelites as a "land flowing with milk and honey."

The British Mandate Government for Palestine was very accommodating and furnished an armoured car to protect us in our travels against attacks of terrorists, who were very active at that time. The Government also furnished us an airplane with special permission to take pictures from the air. The Jewish Agency gave us all facilities to study the agricultural colonies. Because of this excellent co-operation, we had an excellent view of Palestine as it is today.

We found that the soils of red earth had been washed off the slopes to bed rock over more than half the upland area—washed off the slopes and lodged in the valleys where they are still being cultivated and still being eroded by great gullies that cut through the alluvium with every heavy rain. Evidence of rocks washed off the hills were found in piles of stone where tillers of soil had heaped them together to make cultivation about them the easier. From the air we read with startling vividness the graphic story as written in the land, where soils have been washed off to bed rock in the vicinity of Hebron and only dregs of the land are left behind in narrow valley floors, there still cultivated to meagre crops.

In the denuded highlands of Judea are ruins of abandoned village sites. Capt. P. L. O. Guy, Director of the British School of Archaeology, has studied in detail those in the drainage of Wadi Musrara. These sites were occupied 1500 years ago; since that time they have been depopulated and abandoned in greater numbers on the upper slopes. Capt. Guy divided the drainage of Musrara into three altitudinal zones: The plain, 0-325 feet; foothills, 325-975 feet; and mountains, 975 feet and over. In the plain 34 sites were occupied and 4 abandoned; in the foothills, 31 occupied and 65 abandoned; and in the mountains, 37 occupied and 124 abandoned. Villages have thus been abandoned in the 3 zones by percentages in the above order of 11, 67, and 77, which agrees well with the removal of soil. It is little wonder that villages were abandoned in a landscape such as this in the upper zone near Jerusalem, where the soil, source of food supply, has been wasted away by erosion and only remnants of the land left in drainage channels, held there by cross walls of stone.

Where soils are held in place by stone terrace-walls that have been maintained down to the present, we found the soils still cultivated after several thousand years and still producing—not heavily, to be sure, because of poor soil management. Most important, the soils are still in

place and will grow bigger crops with improved soil treatment. We also looked upon the glaring hills of Judea not far from Jerusalem, dotted with only a few of its former villages, whose terraces have been kept in repair for more than 2000 years.

What is the cause of the decadence of this country that was once flowing with milk and honey? As we ponder the tragic history of the Holy Lands, we are reminded of the struggle of Cain and Abel, how it has been made realistic through the ages by the conflict that persists even unto today, between the tent dweller and the house dweller, between the shepherd and the farmer. The desert seems to have produced more people than it could feed; from time to time the desert people swept down into the fertile alluvial valleys where, by irrigation, tillers of soil grew abundant foods to support teeming villages and thriving cities. They swept down as a wolf on the fold to raid the farmers and their supplies of food. Raiders sacked and robbed and passed on, often leaving destruction and carnage in their path, or they replaced former populations and themselves became farmers only to be swept out by a later wave of hungry denizens of the desert.

## BOOK REVIEWS

### **“ECONOMICS WITH APPLICATION TO AGRICULTURE” —Dummeier, Heflebower and Norman. Third Edition. 718 pp. McGraw-Hill.**

Pure economic theory is difficult of understanding and of retention in the memory by the average student unless it is abundantly illustrated and effectively related to current economic problems. The first edition of this text-book in 1934 was designed to satisfy these requirements, particularly for students in agricultural colleges who are expected to be familiar with the fundamental principles of economics and with their application in modern agriculture. It seems to have satisfied the need so well that a third edition has been required. Opportunity has been taken to bring the factual information up to date and completely rewrite several important sections in the light of the dramatic political and economic events of the past ten years. Recognizing that there is not one set of principles of economics applicable to agriculture and another set to other economic activities, the authors nevertheless attempt to answer the question: “How can the economic well-being of those engaged in agriculture be best promoted without unjustifiable interference with the welfare of other parts of the population?”

While not claiming that economic welfare necessarily guarantees human happiness, the authors do contend that most of the objects for which human beings struggle in this world are promoted by economic welfare, and that the economic well-being of our rural population can be promoted by an understanding of the principles of economics applied to agriculture.

Teachers of social studies will find two chapters particularly helpful. The first traces the important stages in the development of the economic life of Europe from the stone age; the stage of direct appro-

priation from nature, the pastoral stage, the agricultural stage, the handicraft stage and the industrial stage characterised by the use of modern power-driven machinery. The following chapter shows how the modern American economy, though definitely related to its European background, has had distinctive developments with interesting parallels in our New Zealand story.

The concluding chapters on economic controls and on capitalism and its critics also provide useful information for the teacher of social studies who attempts to interest his pupils in the problem, "Is a high degree of control over economic activity compatible with a high degree of civil and political liberty as well as freedom and width of economic opportunity?"

Americans as well as New Zealanders are faced with the problem of finding how far we can go in controlling economic activity and yet retaining the liberty which is our heritage.

### **"AN INTRODUCTION TO AGRICULTURAL ECONOMICS"—Robert C. Ross. 1951. 414 pp. McGraw-Hill.**

This is a text designed specifically as an introductory course for students in the land-grant colleges of the United States. One sixth of the book is devoted to the historical background, the remainder to a practical exposition of the economic aspects of present-day American agriculture. Its main interest to a New Zealand teacher would be the factual information on the geography of American agriculture, illustrated by numerous excellent diagrams produced by the U.S. Bureau of Agricultural Economics.

## **NEW PUBLICATION**

### **"PROGENY TESTING IN SHEEP—THE INHERITANCE OF BIRTH WEIGHT, GROWTH RATE AND CARCASS QUALITY IN SOUTHDOWN"—J. W. McLean, Canterbury Agricultural College Technical Publication No. 8. 48 pp. May, 1952.**

This publication records the results of work on progeny testing of Southdown rams carried out at the College from 1944 to 1947. The major aim was to find out if the farmer who selects and pays high prices for so-called high-quality sires, really obtains anything better from the point of view of productivity than the farmer who pays low prices.

The main conclusion reached was that "the practice of phenotypic selection of Southdown rams for fat-lamb production has little to commend it. Selection for excellence in conformation, which is almost wholly the basis of price variation ranging from two to fifteen guineas at local flock-ram fairs over the last few years, does not necessarily identify sires capable of leaving progeny of high quality. Provided they are pure Southdowns, they are all good for the production of this class of fat lamb."

This publication is obtainable from

The Editor,  
Lincoln College P.B.,  
Christchurch.

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