

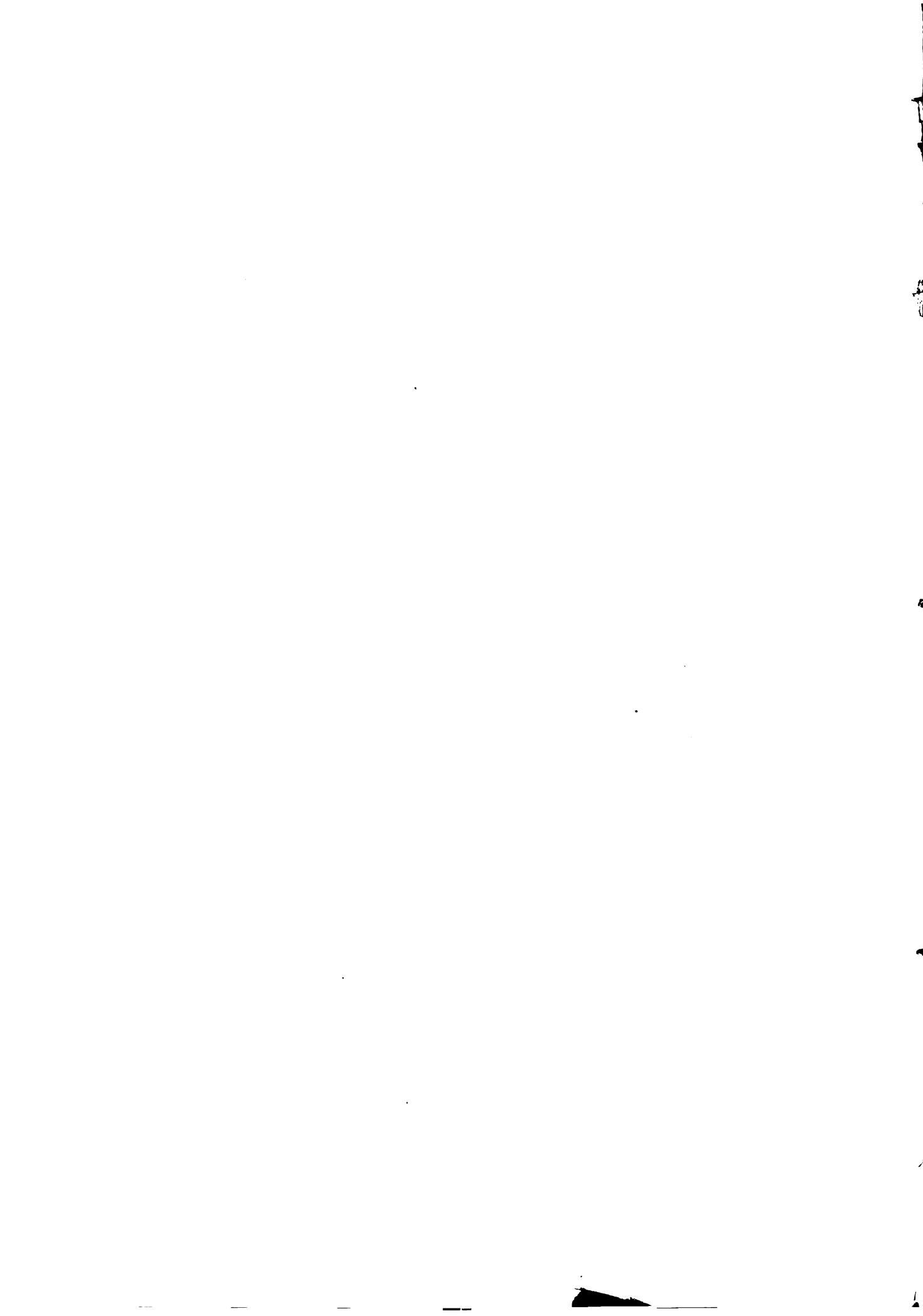


C. D. THOMPSON

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THEESIS
ON
THE EFFECT OF BEETS AND POTATOES
UPON A FEEDING RATION

C. D. THOMPSON



T H E S I S

ON

THE EFFECT OF BEETS AND POTATOES
UPON A FEEDING RATION.

by

C. D. Thompson.

Presented for M. S. Degree

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THESIS

DIGESTION EXPERIMENT.

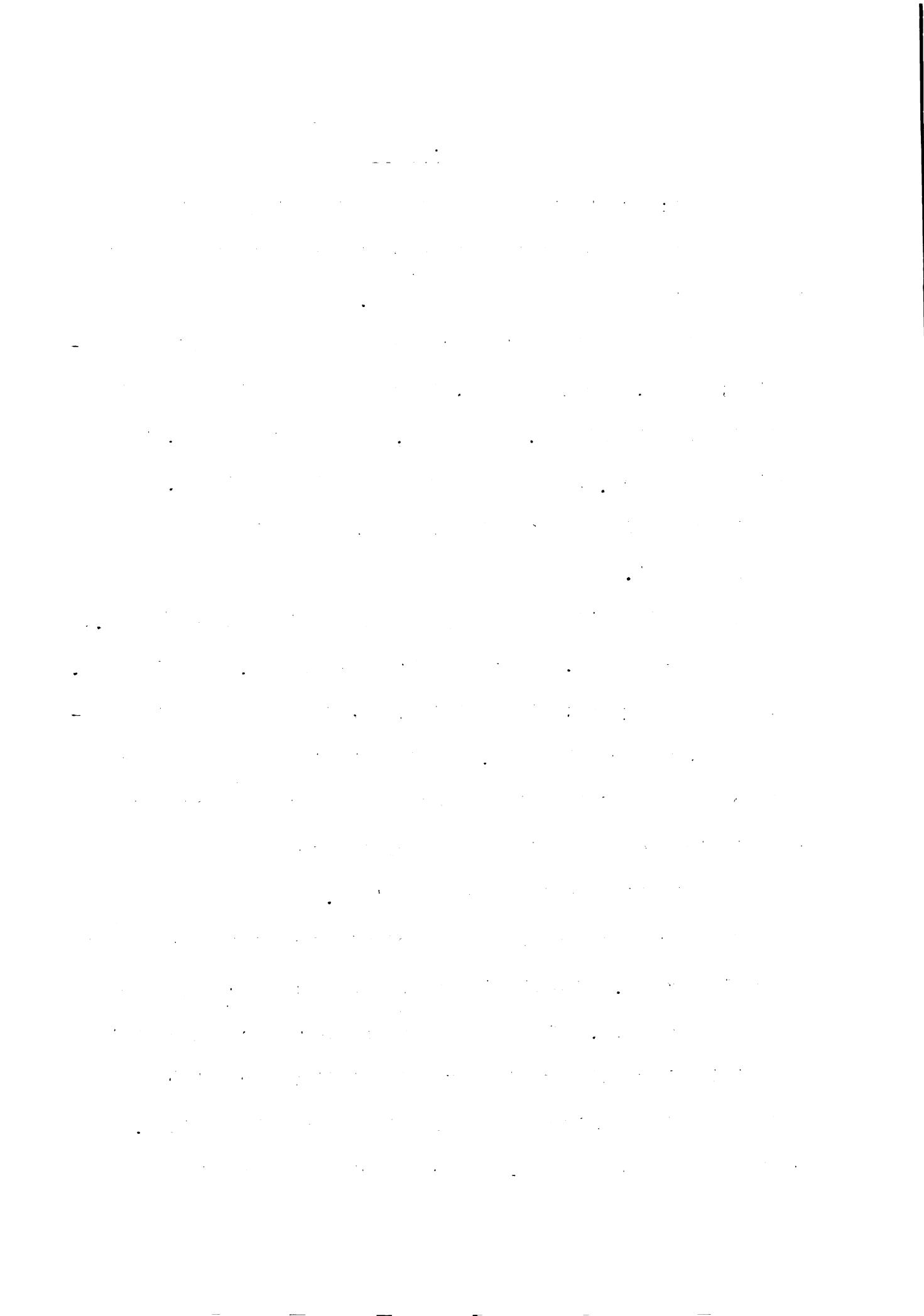
Object: To test the question whether the addition of mangel wurtzels or potatoes to a ration affects the digestibility of the factors of that ration.

For the experiment two cows of the college herd were selected; Halo, a grade Jersey, six months in period of lactation weighing about 750 lbs. and Millie, a grade Shorthorn, three months in period of lactation weighing about 950 lbs.

Halo was in calf about three months at the beginning of the experiment.

The basic ration was composed of wheat bran 3-1/2 lbs., corn meal 3-1/2 lbs. and clover hay 14-1/2 lbs. per 1000 lbs. live weight per day; the nutritive ratio being near the German standard for milk cows. During the time when roots or potatoes were fed the other foods were varied slightly in amounts to keep the daily amount of the dry matter consumed and the nutritive ratio nearly constant.

The corn meal was from corn of mixed varieties and quite coarsely ground. The wheat bran was such as ordinarily comes from the mill. The clover hay was very good in quality and at the beginning of the experiment it was run through an ordinary cutter and made into pieces of about one inch. The roots and potatoes were free from dirt and sliced before



feeding.

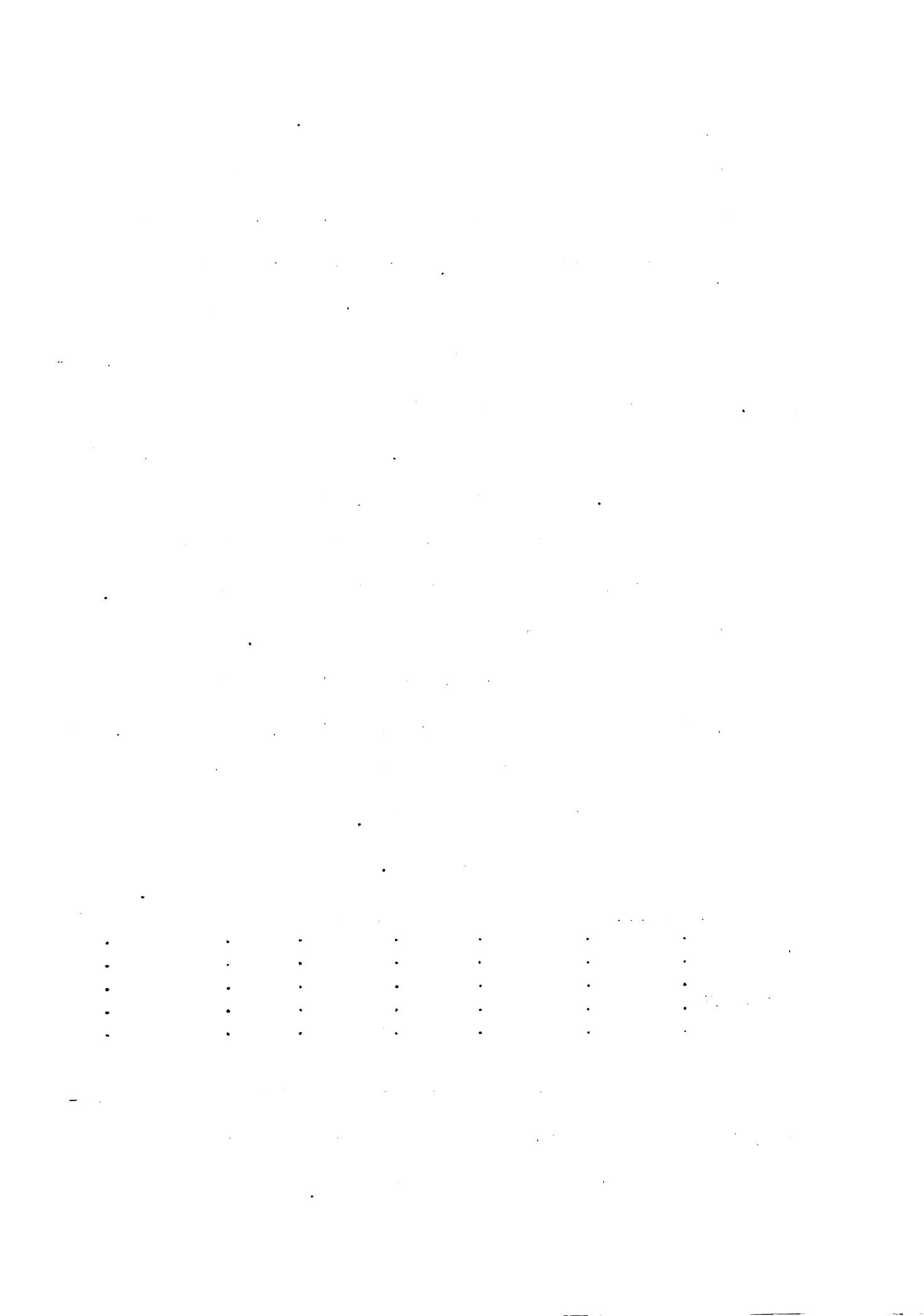
At the beginning of the experiment sufficient quantity of each of the several feeding stuffs was powdered out to last during the entire period. The hay after being cut up was thoroughly mixed, then a sample taken from various places in the pile and these mixed together formed a sample for analysis. The corn meal was sampled by being well stirred and a small quantity taken for analysis. The bran was sampled in a similar manner. The corn was never taken and sampled by means of a butter tester boring holes through the root in various directions and mixing these together for a sample. The potatoes were sampled in a similar manner.

Table I gives the chemical composition of the feeding stuffs; the figures under the ash, protein, crude fiber, fat and nitrogen free extract represent the per cent of each of the dry matter in the given material.

Table I.

	Water	Dry matter	Ash	Protein	Crude fiber	N. free extract	A. free extract
Bran	17.8	87.2	4.8	15.6	4.84	4.	71.17
Corn	12.8	87.3	1.31	12.13	2.3	5.2	77.71
Beets	90.8	9.5	10.8	15.31	7.	2.	65.39
Potatoes	78.	21.	6.7	12.97	2.31	.7	77.42
Hay	12.	68.	7.2	12.75	26.	4.2	59.85

The feed was all mixed together in a tight box or hamper, the hay being firmly trodden just enough to cause the meal to adhere it and thus prevent waste.



Particular care was taken not to feed any more each time than would be eaten up and yet enough to maintain constant weight of the animal and keep up the flow of milk.

The cows were fed and watered regularly twice each day, at 7 A. M. and 5 P. M.

The experiment in its entirety, including preliminary and intermediate periods, lasted fifty two days (from March 7th at 7 A. M. to April 28th at 7 A. M.). It was divided into three separate periods. During the first period the daily ration was composed of wheat bran 6 lbs., corn meal 6 lbs., mangle wurtzels 20 lbs. and clover hay 14 lbs. per thousand pounds of live weight per day. The first eleven days were devoted to preliminary feeding, during which time the cows were allowed to run in the yard, a record being kept of the food and water consumed and the daily weights of the cows. This was done in order that all material foreign to our work be eliminated from the animal body; and to allow the bowel contents to become normal and to gage the appetites of the animals.

At the close of period I the beets were gradually removed and the bran, corn meal and hay increased slightly so as to form a ration as nearly like the ration of the first period in amount of dry matter and chemical constitution as possible.

During the period of 13 days intervening between periods

I and II are considered as intermediate for the purposes. They were followed by the final sample during the campaign.

At the close of this intermediate period the test of the digestibility of the constituents of the hay ration of the cattle was again undertaken. It finds a place in the tally table, and is described under the heading "TEST OF HAY".
 The first sample of the hay ration contained 10.7% protein, 20.7% fiber, 19.1% starch, 11.1% cellulose, 10.1% hemicellulose.
 At the close of the period of intermediate rations the test of the digestibility of the constituents of the hay ration was again undertaken by the addition of potatoes. It contained ten percent protein, 19.1% fiber, 19.1% starch, 11.1% cellulose, 10.1% hemicellulose, 10.1% fiber.

The total digestible rations were fed three days. In regard the ration consisted of bran 6 lbs., corn meal 6 lbs., potatoes 15 lbs. and clover hay 15 lbs. per thousand pounds live weight of animal.

The digestible ration was 10.7% protein, 20.7% fiber, 19.1% starch, 19.1% cellulose, 11.1% hemicellulose, 10.1% fiber.

14. The last part of the experiment was designed to determine the digestibility of the rations when fed to the animals in large quantities both day and night, the rations provided with two pails for each cow, one for collecting manure and the other for collecting feed from the trough. As soon as the animal ate a sufficient amount of feed it was returned to the stall car with a



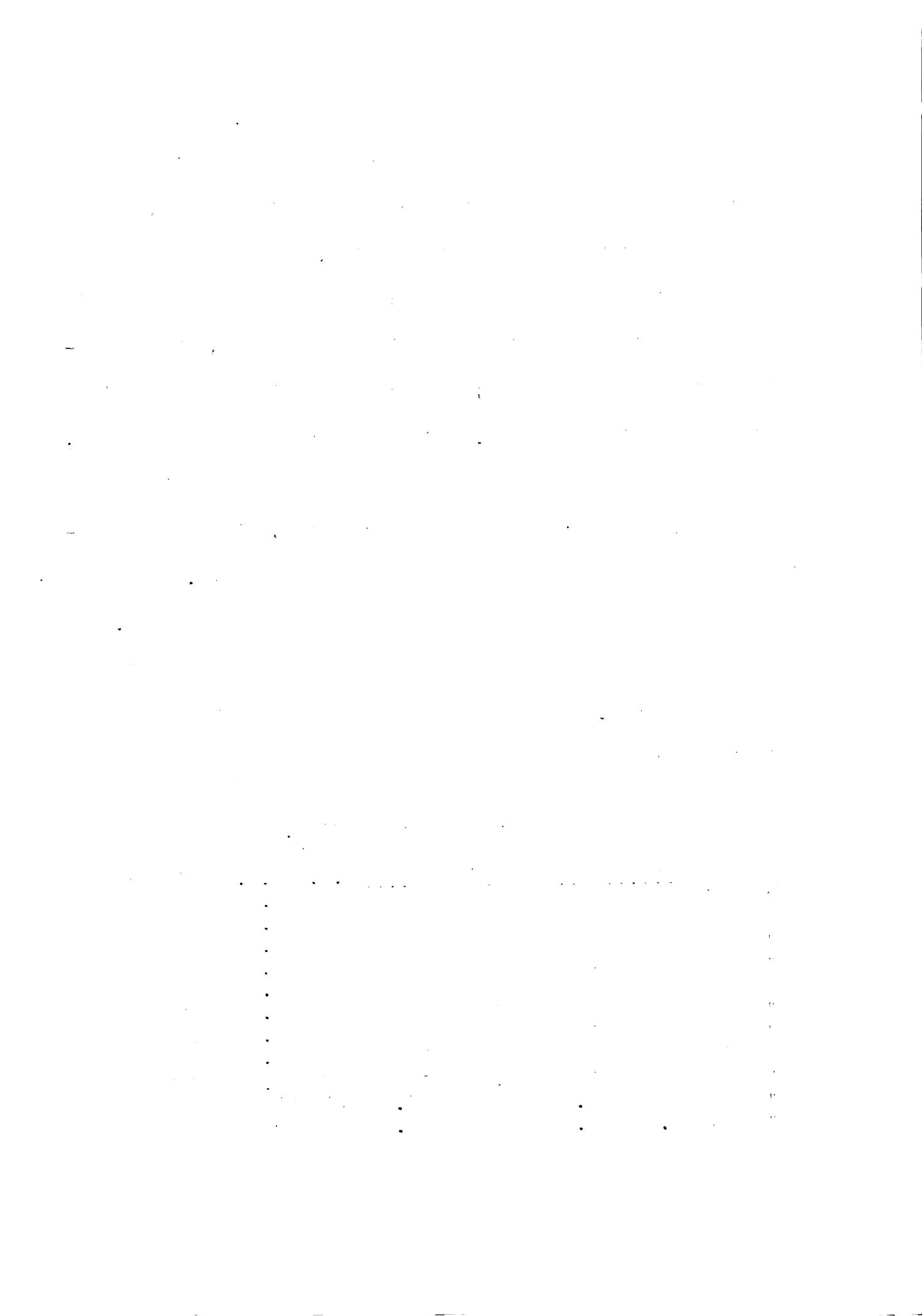
tight cover and left for two hours at room temp. The solid experiment was weighed again and the difference noted. This is the difference between the first and second sample, which was analyzed at the end of the period.

The urine was weighed each morning and allowed to remain in the can until the end of the first three days, when a sample was taken and analyzed; the same operation was repeated during the last three days. The milk was carefully weighed, a sample taken and placed in a can forming a composite sample which was analyzed at the end of three days; the same operation was repeated in the second half of the period.

The milk was collected from Bat 10, the Polled female. Table II shows the daily record of the food and water consumed by Bat 10, as well as her daily weight for the entire experiment.

Table II
Preliminary feeding.

Date	Food	Water	Food			Water			Weight
			10.0	10.0	10.0	10.0	10.0	10.0	
12	3	5	5	10	3	60	50.	763	
"	9	5	5	10	10	60	40.	760	
"	10	5	5	10	10	60	42.	760	
"	11	5	5	14	10	60	57.	767	
"	12	5	5	15	10	60	58.	772	
"	13	5	5	15	10	60	43.	767	
"	14	5	5	15	10	10	50.	763	
"	15	5	5	15	10	27	54.	750	
"	16	5	4.5	15	10.25	got water		771	
"	17	4.5	4.5	15	10.0	14.00		772	



Actual Cost during the six Following Days.

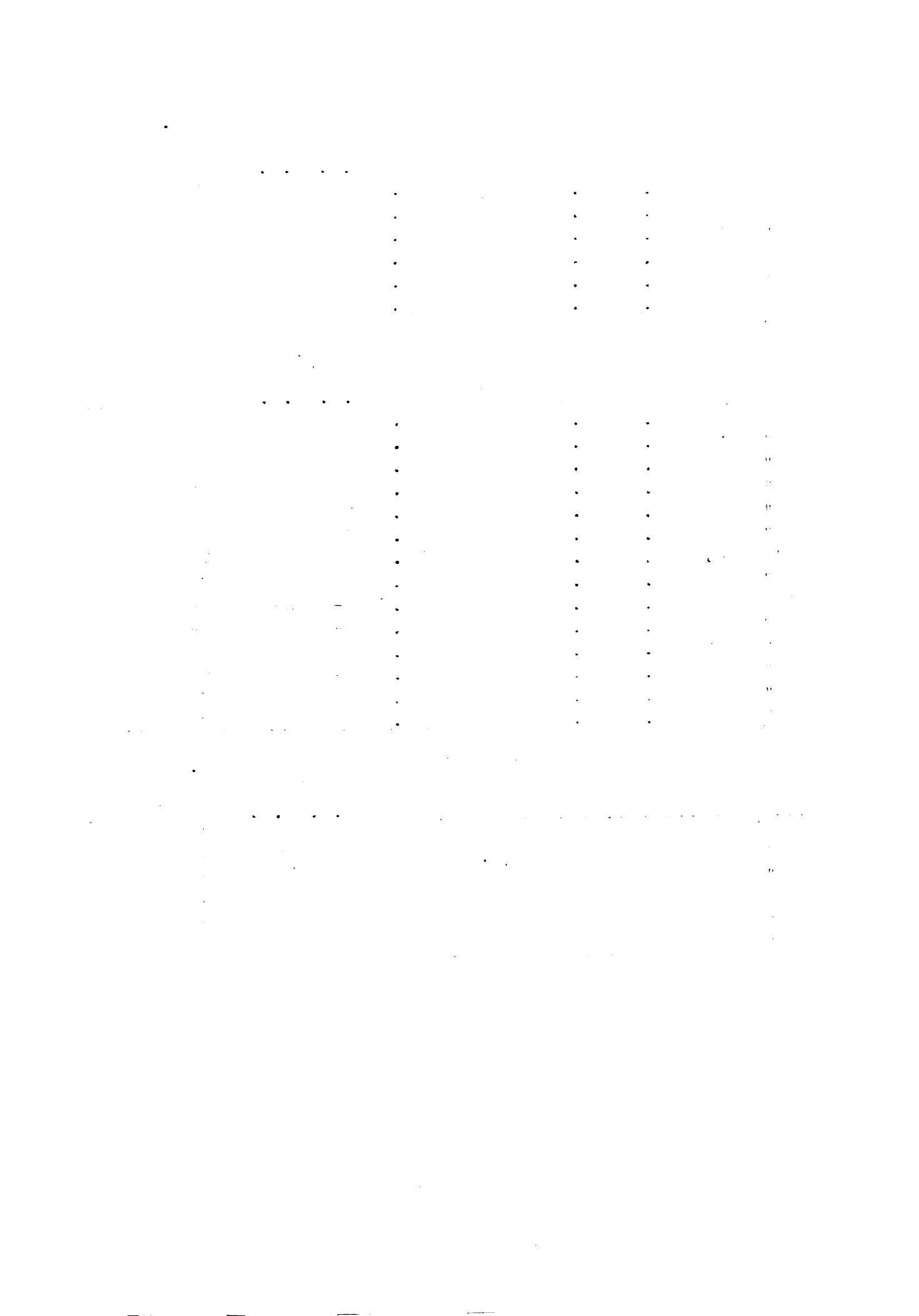
Date	Cost						Wt. of salt
	Per cent						
March 12	4.5	4.5	15	15.5	45	35	755
" 13	4.5	4.5	15	15.5	45	35	755
" 14	4.5	4.5	15	15.5	45	35	755
" 15	4.5	4.5	15	15.5	45	35	755
" 16	4.5	4.5	15	15.5	45	35	755
" 17	4.5	4.5	15	15.5	45	35	755
" 18	4.5	4.5	15	15.5	45	35	755
" 19	4.5	4.5	15	15.5	45	35	755
Sum	225	225	225	225	225	225	225

At intermediate period.

Date	Cost						Wt. of salt
	Per cent						
March 14	4.5	4.5	15	15.5	45	35	755
" 15	4.5	4.5	9	10.5	18	00	733
" 16	4.5	4.5	7	10.5	20	00	741
" 17	4.5	4.5	15	15.5	45	35	755
" 18	4.5	4.5	15	15.5	45	35	755
" 19	4.5	4.5	15	15.5	45	35	755
" 20	4.5	4.5	15	15.5	45	35	755
" 21	4.75	4.75	14	14	00	--	733
April 1	5.	5.	15	15.5	45	35	755
" 2	5.	5.	15	15.5	45	35	755
" 3	5.	5.	15	15.5	45	35	755
" 4	5.	5.	15	15.5	45	35	755
" 5	5.	5.	15	15.5	45	35	755
" 6	5.	5.	15	15.5	45	35	755
Sum	225	225	225	225	225	225	225

Actual Cost during the six Previous Days.

Date	Cost						Wt. of salt
	Per cent						
March 7	5	5	5	11	32	38	722
" 8	5	5	5	11	35	40	747
" 9	5	5	5	11	37	41	751
" 10	5	5	5	11	40	38	733
" 11	5	5	5	11	41	30	743
" 12	5	5	5	11	42	40	743
Sum	225	225	225	225	225	225	225



Intermediate period.

Date	Temp.	Wind	Cloud	Precipitation				Max.	Min.	Rate	Wind
				May	June	July	Aug.				
April 11	16	E	S			11.	10.	42	723		
" 14	E	S	S	11.5	11.	10.	30	62	717		
" 15	S	S	S	7.	20.75	21.	30	60	620		
" 17	S.	S.	S.	10.	21.	11.	40	713			
" 19	4.5	4.5	15.	15.	10.	11.	10.	713			
" 20	4.5	4.5	14.	14.	10.	10.	30	703			
" 21	4.5	4.5	14.	14.	10.	10.	24.	720			
" 22	4.5	4.5	11.75	8.5	50	60	700				
" 23	4.5	4.5	11.75	9.5	20	50	700				
" 25	4.5	4.5	11.75	9.5	20	50	700				

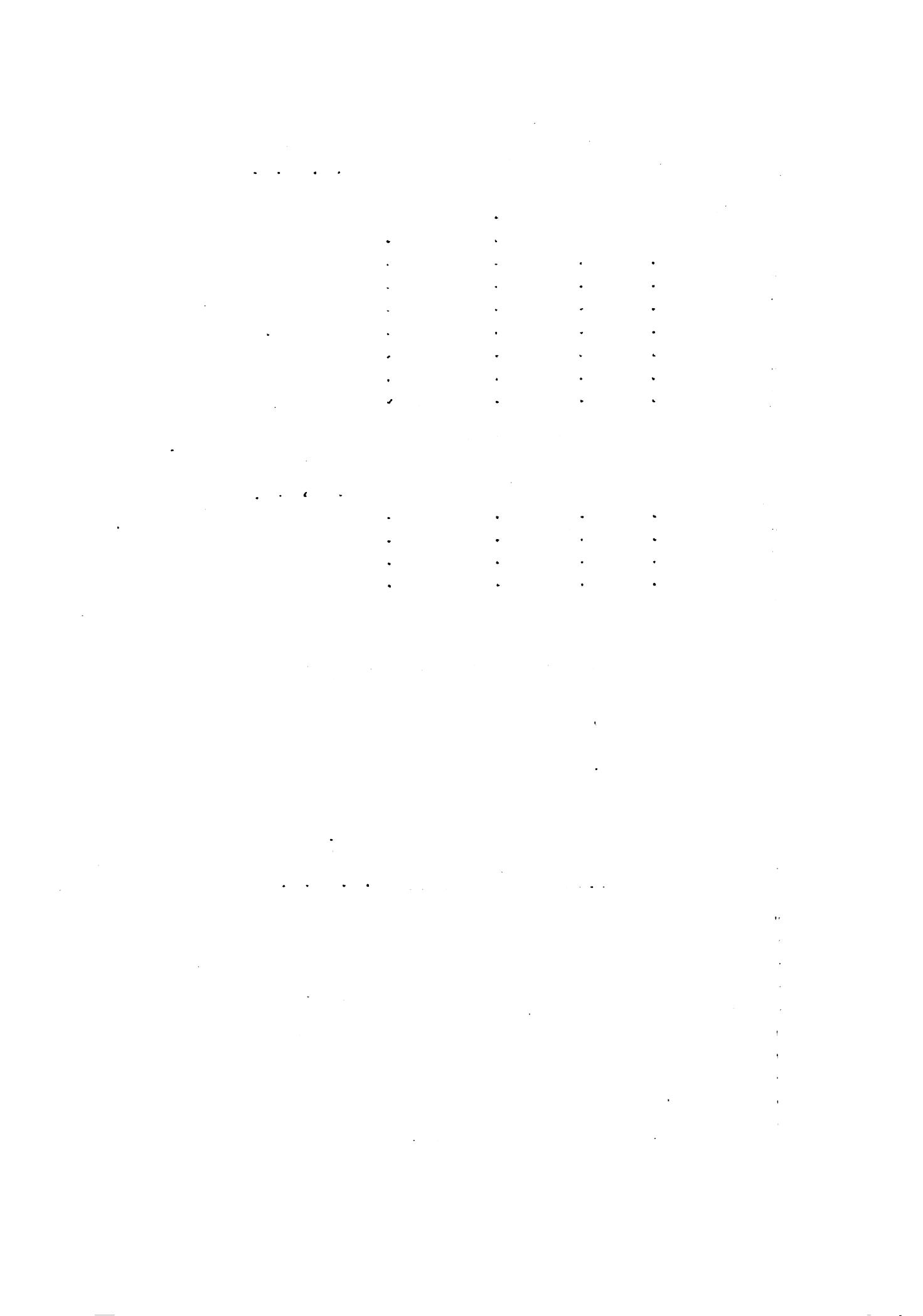
Latent heat during the same following days.

Date	Temp.	Wind	Precipitation				Max.	Min.	Rate	Wind
			May	June	July	Aug.				
May 17	4.5	4.5	12.75	8.5	70	40	720			
" 24	4.5	4.5	10.25	8.5	20	12	724			
" 25	4.5	4.5	11.75	8.5	50	70	712			
" 26	4.5	4.5	11.75	8.5	20	70	704			
" 27	4.5	4.5	11.75	8.5	20	70	704			

Table III shows the daily record of the cloud and water evaporation data; it also gives the daily output for the entire experiment.

Table III
Preliminary results.

Month	Temp.	Wind	Cloud	Precipitation				Water		Wind
				May	June	July	Aug.	Rate	Rate	
May 7	3	S	S	11	12	5	50	50	50	
" 8	3	S	S	11	12	5	50	50	50	
" 9	3	S	S	14	14	60	62	62	62	
" 10	3	S	S	13	14	60	55	55	55	
" 11	3	S	S	15	14	37	40	40	40	
" 12	3	S	S	10	14	4	40	40	40	
" 13	3	S	S	10	14	4	40	40	40	
" 14	3	S	S	20	14	20	20	20	20	
" 15	3	S	S	20	14	23	20	20	20	
" 16	3	S	S	20	14	25	20	20	20	
" 17	3	S	S	20	14	22	20	20	20	



Average Test during the last four months 1888.

July, Aug., Sept., Oct., Nov., Dec.

Month	1888	1887	1886	1885	1884	1883	1882
" July	10	10	10	14	14	14	14
" Aug.	10	10	10	14	14	14	14
" Sept.	10	10	10	14	14	14	14
" Oct.	10	10	10	14	14	14	14
" Nov.	10	10	10	14	14	14	14
" Dec.	10	10	10	14	14	14	14

Average Test during the last four months 1888.

July, Aug., Sept., Oct., Nov., Dec.

Month	1888	1887	1886	1885	1884	1883	1882
" July	10	10	10	14	14	14	14
" Aug.	10	10	10	14	14	14	14
" Sept.	10	10	10	14	14	14	14
" Oct.	10	10	10	14	14	14	14
" Nov.	10	10	10	14	14	14	14
" Dec.	10	10	10	14	14	14	14

Average Test during the last four months 1888.

July, Aug., Sept., Oct., Nov., Dec.

Month	1888	1887	1886	1885	1884	1883	1882
" July	10	10	10	14	14	14	14
" Aug.	10	10	10	14	14	14	14
" Sept.	10	10	10	14	14	14	14
" Oct.	10	10	10	14	14	14	14
" Nov.	10	10	10	14	14	14	14
" Dec.	10	10	10	14	14	14	14

Average Test during the last four months 1888.

July, Aug., Sept., Oct., Nov., Dec.

Month	1888	1887	1886	1885	1884	1883	1882
" July	10	10	10	14	14	14	14
" Aug.	10	10	10	14	14	14	14
" Sept.	10	10	10	14	14	14	14
" Oct.	10	10	10	14	14	14	14
" Nov.	10	10	10	14	14	14	14
" Dec.	10	10	10	14	14	14	14

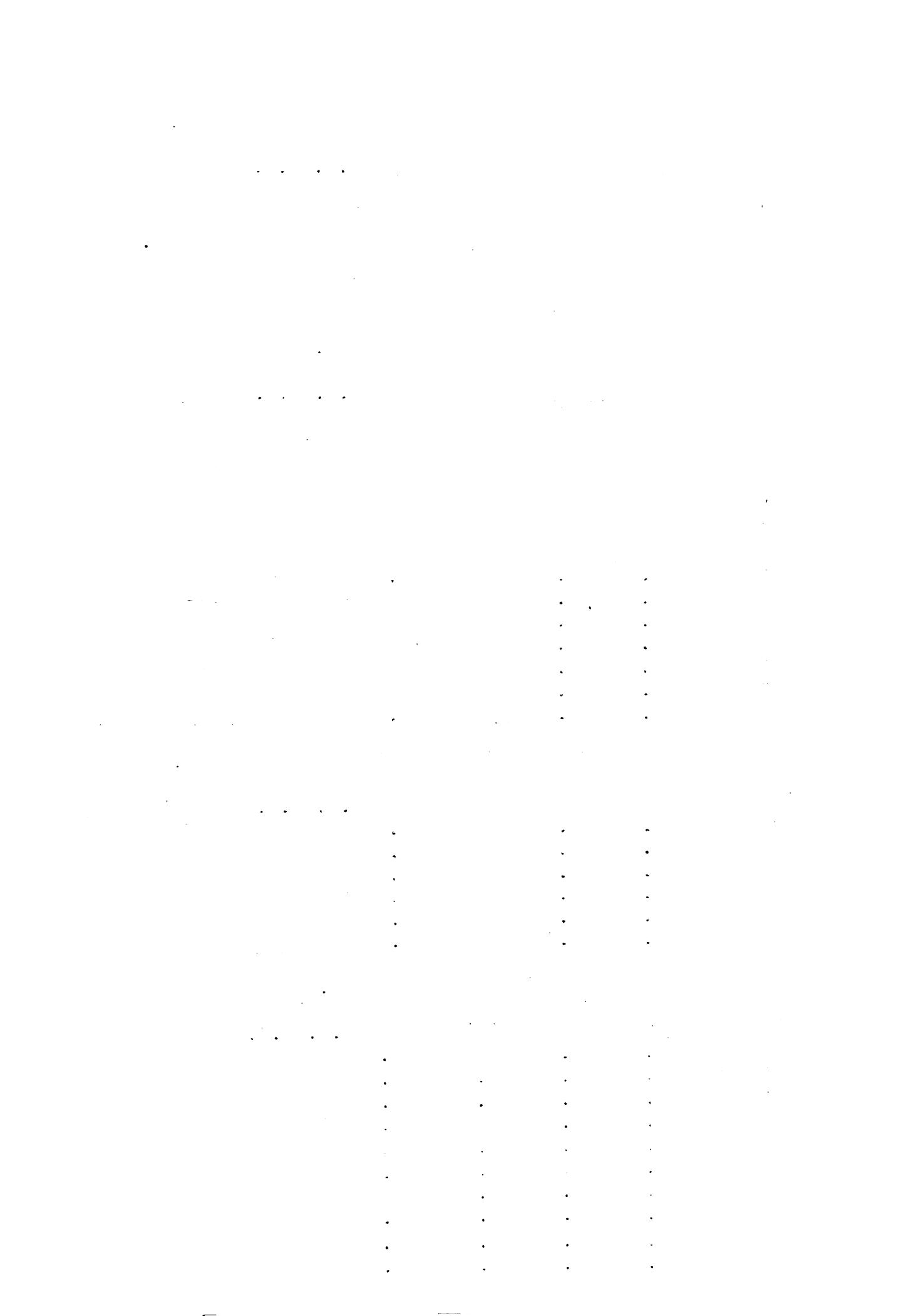


TABLE IV.
ANALYSIS OF THE DRY MATERIALIZED OILS.

	Year	Month	Days	Age	Crude oil	After	Crude oil	Crude oil
"	84	9	6	16	12.5	4	4	38.3
"	85	9	6	17	12.5	4	4	37.7
"	85	9	6	17	12.5	3	3	34.8
"	87	9	6	17	12.5	3	3	37.7

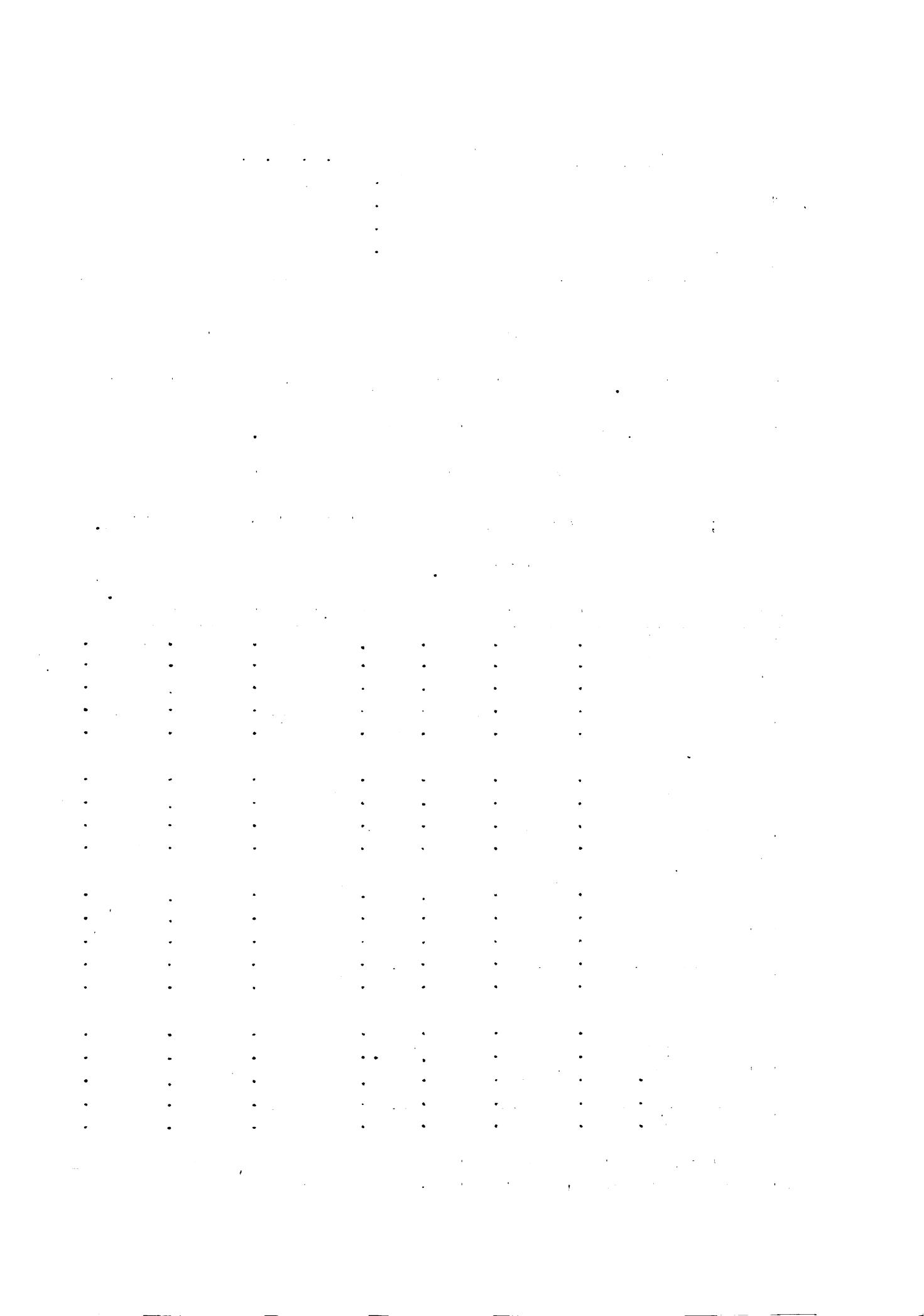
On March 21st April 1st the cows were subjected to the experimental feed. During this time no record was kept of the water content, or the weights of the animals.

The following table gives the amount of water taken up by the cattle, and the quantity and composition of the ration.

Table IV.

	Year	Month	Days	Age	Crude oil	Crude oil	Crude oil	Crude oil
Period I.								
Total	87	10	11	17	12.5	1.54	1.00	10.77
Mean	87	10	11	17	12.5	1.02	0.69	10.41
Median	87	10	11	17	12.5	1.03	0.69	10.63
Max.	87	10	11	17	12.5	1.03	0.69	10.93
Total	87	10	11	17	12.5	1.54	1.00	10.77
Mean	87	10	11	17	12.5	1.02	0.69	10.41
Median	87	10	11	17	12.5	1.03	0.69	10.63
Max.	87	10	11	17	12.5	1.03	0.69	10.93
Period II.								
Total	88	10	11	18	13.0	1.37	0.91	11.63
Mean	88	10	11	18	13.0	1.37	0.91	11.47
Median	88	10	11	18	13.0	1.37	0.91	11.43
Max.	88	10	11	18	13.0	1.37	0.91	11.64
Total	88	10	11	18	13.0	1.37	0.91	11.63
Mean	88	10	11	18	13.0	1.37	0.91	11.63
Median	88	10	11	18	13.0	1.37	0.91	11.63
Max.	88	10	11	18	13.0	1.37	0.91	11.64
Period III.								
Total	89	10	11	19	13.5	1.37	0.91	11.17
Mean	89	10	11	19	13.5	1.37	0.91	11.13
Median	89	10	11	19	13.5	1.37	0.91	11.13
Max.	89	10	11	19	13.5	1.37	0.91	11.13
Total	89	10	11	19	13.5	1.37	0.91	11.13
Mean	89	10	11	19	13.5	1.37	0.91	11.13
Median	89	10	11	19	13.5	1.37	0.91	11.13
Max.	89	10	11	19	13.5	1.37	0.91	11.14
Period IV.								
Total	90	10	11	20	14.0	1.37	0.91	11.71
Mean	90	10	11	20	14.0	1.37	0.91	11.46
Median	90	10	11	20	14.0	1.37	0.91	11.46
Max.	90	10	11	20	14.0	1.37	0.91	11.60
Total	90	10	11	20	14.0	1.37	0.91	11.46
Mean	90	10	11	20	14.0	1.37	0.91	11.46
Median	90	10	11	20	14.0	1.37	0.91	11.46

This table is the same as the one next above, but is calculated to a six day period to compare with periods I and II.



10. The following table shows the number of hours worked by each employee in a company.

¹ See also the recent study by G. S. Nakhnikian and A. V. Tikhonov, "The History of the First Russian Space Station," *Roscosmos*, No. 1, 2000.

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the following day, the same as the day before, and from thence to the 1st of April.

¹ See also the discussion of the relationship between the two in the section on "Theoretical Implications."

¹ See also the discussion of the relationship between the two in the section on "The Nature of the State," above.

points. In period II 24.1% Ma. and in period III 14.6% R.s.; a marked increase. This means that the ratio of the older to the younger forms has increased, indicating a greater degree of stability.

已知的有 100 多種，分布於歐洲、亞洲、北美洲和南美洲。

7. *W. E. H. Cope*, *Archaeopteryx*, p. 10.



the first year of marriage, provided upon the introduction of a new wife into the family, the same number as in the previous year.

and the other two were in the same condition as the first. The last was a female, and was found in the same condition as the others.

For the first time, we find the author visiting the island of India
and the South China Sea, the islands around the Gulf of Siam, and back to
China again, this time to Kienlong, Canton, Amoy, and back to
Canton again, this time to Kienlong again. A. 1880.

• 2 •

Purchased from		Total value		Total value		Total value		Total value			
Period	Source	Period	Total	Period	Total	Period	Total	Period	Total		
1930	Supplier	1930	Total	1930	Total	1930	Total	1930	Total		
1930	Supplier	1930	Total	1930	Total	1930	Total	1930	Total		
"	11	261	17.40	11	42	1930	14	16.18	1930	57	33.82
"	11	262	43.41	263	41	1930	40	31.44	1930	58	33.50
"	11	263	43.41	263	41	1930	40	31.44	1930	58	33.50
1930	Supplier	1930	Total	1930	Total	1930	Total	1930	Total		
1930	Supplier	1930	Total	1930	Total	1930	Total	1930	Total		
"	11	264	17.40	11	42	1930	14	16.18	1930	57	33.82
"	11	265	43.41	265	41	1930	40	31.44	1930	58	33.50
"	11	266	43.41	266	41	1930	40	31.44	1930	58	33.50
1930	Supplier	1930	Total	1930	Total	1930	Total	1930	Total		
1930	Supplier	1930	Total	1930	Total	1930	Total	1930	Total		
"	11	267	17.40	11	42	1930	14	16.18	1930	57	33.82
"	11	268	43.41	268	41	1930	40	31.44	1930	58	33.50
"	11	269	43.41	269	41	1930	40	31.44	1930	58	33.50

in 'ring in' period I can do probably best on food and drink the amount of rest I can possibly have now. In general the Hahn family will be able to help me get through the 'ring in' period more easily than you. Miller, Frank and I are going to be at the 'ring in' period, and Frank and I are going to be at the 'ring in' period, and Frank and I are going to be at the 'ring in' period.

"While paleozoic contains considerable water it seems that
the glaciator has been unable to penetrate the limestone there
was an independent origin of water in itself.

Table VII shows the weight of each object at the beginning.



1

Journal of the American Mathematical Society

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Period	Date	Time	Min. A.
Period 1	May 10	741.0	85.0
"	" 11	741.0	85.0
Period 2	April 7	743.0	85.0
"	" 12	745.0	85.0
Period 3	May 10	741.0	85.0
"	" 11	741.0	85.0

and the first of the 1860's, was followed by, the Civil War and its
consequences and the depression. In many cases there was a
marked increase in the number of those who were employed
and those who had no means. In 1860, there was about 1,000
employed and 1,000 idle. In 1865, there was about 1,500
employed and 1,500 idle. This is due to a large
number of men who had been away during the war, and
who returned to their former employments. The
idle class increased rapidly from 1865 to the close of the year 1869,
when it reached 1,500.

the first time in the history of the world, the people of the United States have been compelled to go to war with their own government, and to do it in defense of their own rights.

After the above have been made, by both demand and finding, examinations, to determine the amount of damage, and the known value of the goods, and the amount of the claim, and the amount of the premium to be paid, by the assured, to the insurance company.



The quantity, however, was very small.

All analyses, both of food and excrement, were made in duplicates, and in the tables averages of these duplicates are recorded.

Table VIII gives the percentage composition of the solid excrement, also the total pounds of each constituent.

Table VIII.

Halo Period I, Percentage composition of dung.

Dry Water	Eth. mat.	Crude Alb. Ash ext.	True Nit.	Crude N.Frc prot.nit.	alb.	fibre	ext.
83.18	16.82	8.64	3.21	2.56	13.20	2.06	12.87
Period II							
83.2	16.8	8.1	2.55	2.35	14.68	2.01	12.56
Period III							
83.2	17.8	7.25	3.7	2.37	14.01	1.81	11.94

Total pounds of each constituent in dung.

Period I

Dry Weight	Eth. Water	Crude Alb. mat.	True Ash ext.	Crude N.Frc Nit.	alb.	fibre	ext.
220.76	183.62	37.33	3.21	1.19	.85	5.84	.76
Period II							
238.25	193.14	40.11	3.25	1.02	.84	5.89	.81
Period III							
251.63	203.34	44.79	3.25	1.66	1.06	6.68	.81

Milla, Period I Percentage composition of dung.

Dry Water	Eth. mat.	Crude Alb. Ash ext.	True Nit.	Crude N.Frc prot.nit.	alb.	fibre	ext.
84.04	15.96	8.62	3.8	2.54	15.88	2.04	12.75
Period II							
83.65	16.95	8.10	2.58	2.45	15.31	2.00	12.50
Period III							
83.61	16.39	8.06	3.7	2.72	17.00	2.14	13.37

Total pounds of each constituent in dung.

Milla, Period I,

Weight	Dry mat.	Ash ext.	Nit.	Crude Ash.	True prot.	nit.	Crude N.Fro. fibre ext.
314.25	207.47	60.78	4.88	1.83	1.20	8.66	1.03 6.47 13.71 22.70
302.75	261.40	51.32	4.16	1.32	1.26	7.86	1.03 6.42 15.07 22.91
301.13	261.73	49.36	3.98	1.82	1.34	8.49	1.06 6.60 15.17 19.89

From this table we see, that Milla produced 17.5 lbs. more dung in period II than in period I and 30.68 lbs. more in period III than in period I. In period II she produced 8.86 lbs. more dry matter than in period I, while in period III she produced 7.66 lbs. more than in period I.

Milla produced 15.60 lbs. less dung in period II than in period I and 17.13 lbs. less in period III than in period I. In the dry matter she gave .55 lbs. more in period II than in period I and 1.42 lbs. more in period II than in period III.

Comparing one period with another it would seem as if all the functions of digestion were carried on with considerable uniformity.

The milk yield.- An accurate record was kept of the amount of milk produced. At each milking a sample was taken, and placed in a can, forming a composite sample, which was analyzed at the middle and close of each period.

Table IX gives the weight and percentage composition of the milk; also, the total pounds of each constituent.

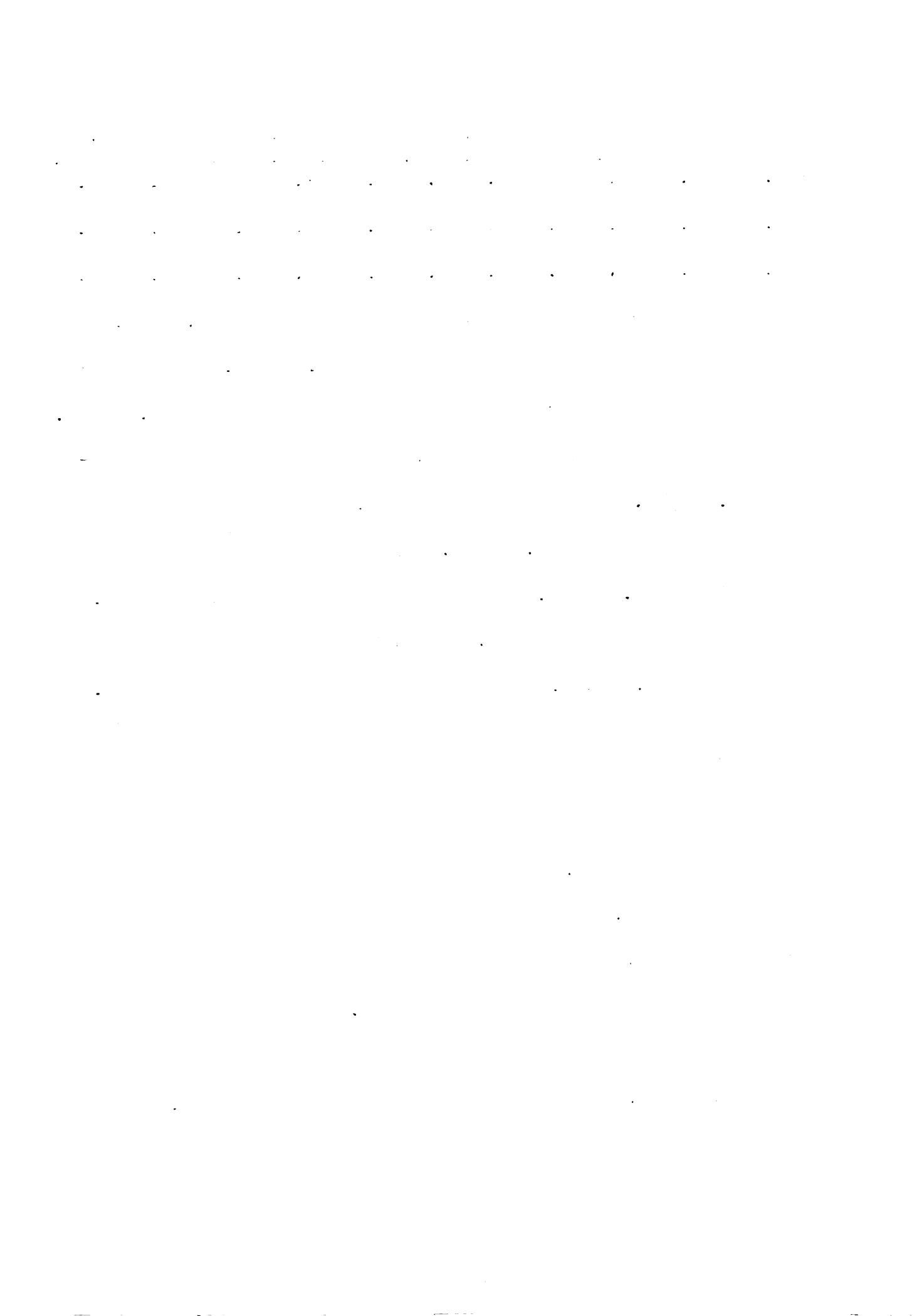


TABLE III.

	Period I			Period II		
	Mean	SD	CV%	Mean	SD	CV%
Wheat	140.1	10.1	7.2	139.1	10.3	7.4
Total	140.1	10.1	7.2	139.1	10.3	7.4
Period I	140.1	10.1	7.2	139.1	10.3	7.4
Period II	139.1	10.3	7.4	139.1	10.3	7.4
Total	140.1	10.1	7.2	139.1	10.3	7.4
Wheat	140.1	10.1	7.2	139.1	10.3	7.4
Total	140.1	10.1	7.2	139.1	10.3	7.4
Period I	140.1	10.1	7.2	139.1	10.3	7.4
Period II	139.1	10.3	7.4	139.1	10.3	7.4
Total	140.1	10.1	7.2	139.1	10.3	7.4
Wheat	140.1	10.1	7.2	139.1	10.3	7.4
Total	140.1	10.1	7.2	139.1	10.3	7.4
Period I	140.1	10.1	7.2	139.1	10.3	7.4
Period II	139.1	10.3	7.4	139.1	10.3	7.4
Total	140.1	10.1	7.2	139.1	10.3	7.4
Wheat	140.1	10.1	7.2	139.1	10.3	7.4
Total	140.1	10.1	7.2	139.1	10.3	7.4
Period I	140.1	10.1	7.2	139.1	10.3	7.4
Period II	139.1	10.3	7.4	139.1	10.3	7.4
Total	140.1	10.1	7.2	139.1	10.3	7.4

Table III shows the results obtained with each of the three different periods. The only difference, except the day belonging to which I worked, was a difference of 1.1% in the mean per day than in period II or III, and this is considerably less than the difference of 1.5% between the days belonging to period II or III.

The average yield of wheat was 139.1 kg. per hectare, equivalent to 5 bush. per acre; or it required 17.57 kg. per hectare to produce 1 kg. of wheat. In period II who consumed 140.53 kg. dry matter to yield 1 kg. of wheat; or at requires 17.47 kg. dry matter to produce 1 kg. of wheat. In period III who

and the following table gives the results obtained. The first two periods show a slight increase in the amount of fat produced per pound of raw material, from 5.00 lbs. in Period I to 5.42 lbs. in Period II, and a slight decrease in the amount of fat produced per pound of raw material, from 5.42 lbs. in Period II to 5.33 lbs. in Period III. The amount of fat produced per pound of raw material was 5.33 lbs. in Period III, which is slightly less than in Period II. The amount of fat produced per pound of raw material in Period III was 5.33 lbs., which is slightly less than in Period II. The amount of fat produced per pound of raw material in Period III was 5.33 lbs., which is slightly less than in Period II.

Table X gives the above facts in condensed form.

Table X.

Period	Raw material	Rate of production of fat	
		per cent	to produce 1 lb. of butterfat
Period I	1375.82	5.00	27.50
"	1375.51	5.42	27.47
"	1311.311.50	5.33	27.33
Period II	142.00	5.40	27.40
"	142.00	5.33	27.33
"	142.00	5.33	27.33

The following table gives the results obtained in Period III, and shows the amount of fat produced per pound of raw material in Period III, and the amount of fat produced per pound of raw material in Period II, and the amount of fat produced per pound of raw material in Period I.

So we conclude, on the whole, that there is but little difference between the results of the three periods.

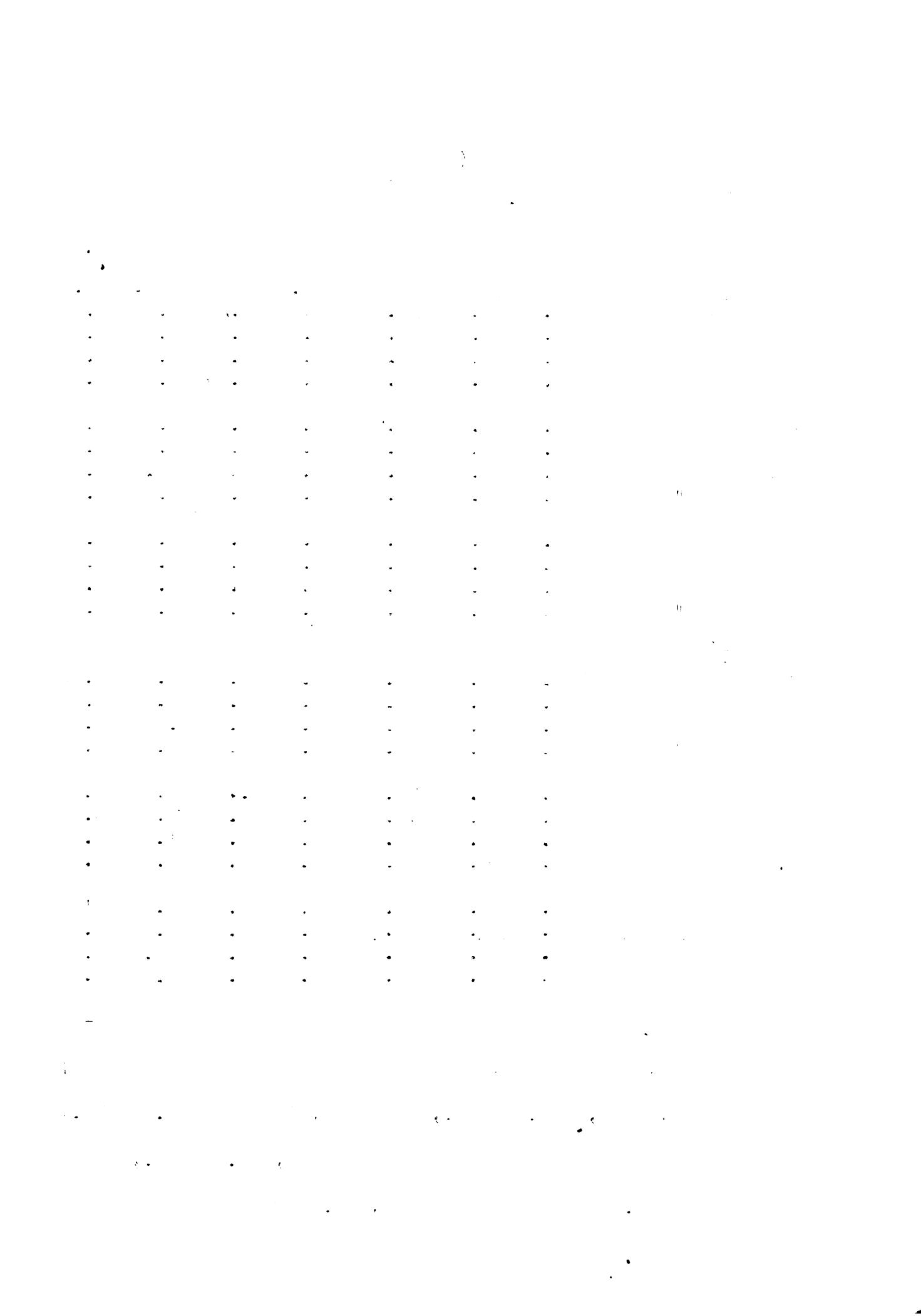
With all the data at hand, it would be easy to determine the cost of production, labor, materials, and overhead.

per cent of each digest.

Table VI

	Per cent	Crude fiber	Crude protein	Crude fat	Crude ash	Protein digest	
Period I							
Consumed in food	111.74	6.17	304.47	1.67	17.77	34.10	47.67
Returned in dung	47.12	4.11	117.77	1.41	11.42	21.42	31.42
Pounds digested	74.11	2.06	186.70	0.41	10.35	14.14	47.44
Per cent *	<u>65.73</u>	<u>49.43</u>	<u>67.14</u>	<u>7.11</u>	<u>47.94</u>	<u>33.37</u>	<u>77.45</u>
Period II							
Consumed in food	110.53	5.73	174.86	4.23	20.73	14.97	32.24
Returned in dung	40.17	3.11	51.76	3.01	11.42	7.36	16.04
Pounds digested	70.47	2.43	123.10	3.84	10.37	7.21	44.21
Per cent *	<u>65.73</u>	<u>49.43</u>	<u>67.14</u>	<u>7.11</u>	<u>47.94</u>	<u>33.37</u>	<u>77.45</u>
Period III							
Consumed in food	111.74	5.95	185.64	4.57	20.64	16.07	32.37
Returned in dung	47.12	3.11	44.76	1.66	12.51	6.38	20.84
Pounds digested	74.11	2.70	140.88	2.71	7.77	8.29	22.12
Per cent *	<u>65.73</u>	<u>47.14</u>	<u>65.37</u>	<u>3.71</u>	<u>27.02</u>	<u>55.16</u>	<u>40.41</u>
Period I							
Consumed in food	143.80	7.51	139.07	6.88	24.31	20.26	32.1
Returned in dung	51.32	4.16	48.42	1.82	12.71	3.01	22.72
Pounds digested	92.48	3.35	90.13	5.04	14.92	11.74	38.43
Per cent *	<u>65.73</u>	<u>47.14</u>	<u>65.37</u>	<u>53.67</u>	<u>24.31</u>	<u>20.26</u>	<u>32.1</u>
Period II							
Consumed in food	144.80	7.51	136.29	6.36	20.99	19.60	31.34
Returned in dung	51.32	4.16	47.16	1.82	15.07	7.86	22.91
Pounds digested	93.48	3.85	89.13	5.04	14.92	11.74	38.43
Per cent *	<u>65.73</u>	<u>49.43</u>	<u>65.37</u>	<u>53.67</u>	<u>24.75</u>	<u>20.90</u>	<u>31.33</u>
Period III							
Consumed in food	147.90	7.87	140.03	5.80	20.45	19.94	37.84
Returned in dung	49.36	3.98	45.38	1.82	15.17	8.40	19.89
Pounds digested	98.54	3.82	94.65	3.98	11.28	11.54	46.85
Per cent *	<u>65.62</u>	<u>49.43</u>	<u>67.59</u>	<u>43.64</u>	<u>57.87</u>	<u>77.84</u>	

In order to determine the digestibility of rye meal consumed in food, the following figures were obtained in Period I; the column 1, food, 111.74 lbs., return 1, in dung, 57.10 lbs., and 2, the difference between these amounts, 74.11 lbs., is the pound digested. The pounds digested, 74.11 divided by the next



ber of pounds consumed, 111.84, gives 66.61 which is the per cent of the dry matter digested; or, in other words is the coefficient of digestibility.

In the same period Halo consumed, in food, 15.18 lbs. protein, returned in dung 5.94 lbs. leaving 9.24 lbs. digested. 9.24, the amount digested, divided by 15.18, the amount consumed, gives 48.82 which is the per cent of the crude protein digested; or, the co-efficient of digestibility for crude protein is 48.82.

In a similar manner the other co-efficients of digestibility are calculated.

In table XII are brought together, for farther comparison, the digestive co-efficients of the various constituents of the ration as indicated by both cows.

Table XII.

Halo

Period	I	Dry	Organic Ether		Crude	Crude N. Free	ext.	fibre prot., ext.
		matter	Ash	Matter	ext.			
Period I	I	66.62	48.80	67.69	74.52	48.94	60.87	75.45
Period II	II	63.73	43.28	64.84	79.01	47.71	60.65	71.01
Period III	III	59.86	45.37	60.67	62.01	35.20	55.85	69.42
Milla								
Period I	I	65.76	47.54	68.83	63.97	53.78	60.22	72.91
Period II	II	65.55	44.60	65.39	79.23	49.75	59.80	71.83
Period III	III	66.62	49.43	67.59	68.62	42.64	59.87	77.24

This table shows, in the first place, how accurately the work of the digestive organs of one cow correspond with that of the other. For example, of the dry matter consumed in period I, Halo digested 66.62% and Milla 65.76%. Of the crude protein,



and the author of the book, and the author of the same.

It is also important to note that the results of the study are limited to the specific context of the study, which is the implementation of the new curriculum in a particular school. The findings may not be generalizable to other schools or contexts.

To the addition of heat, to this ratio, the same oxygen
is added, which is required to decompose the hydrocarbons,
and to give off the water. The oxygen may be added by means of air, oxygen
gas, or by the action of a strong alkali. After combustion, if the carbon
has been completely oxidized, there will remain only the water and the
hydrogen, which have been converted into water. If the carbon has not
been completely oxidized, there will remain a portion of the original
hydrocarbon.

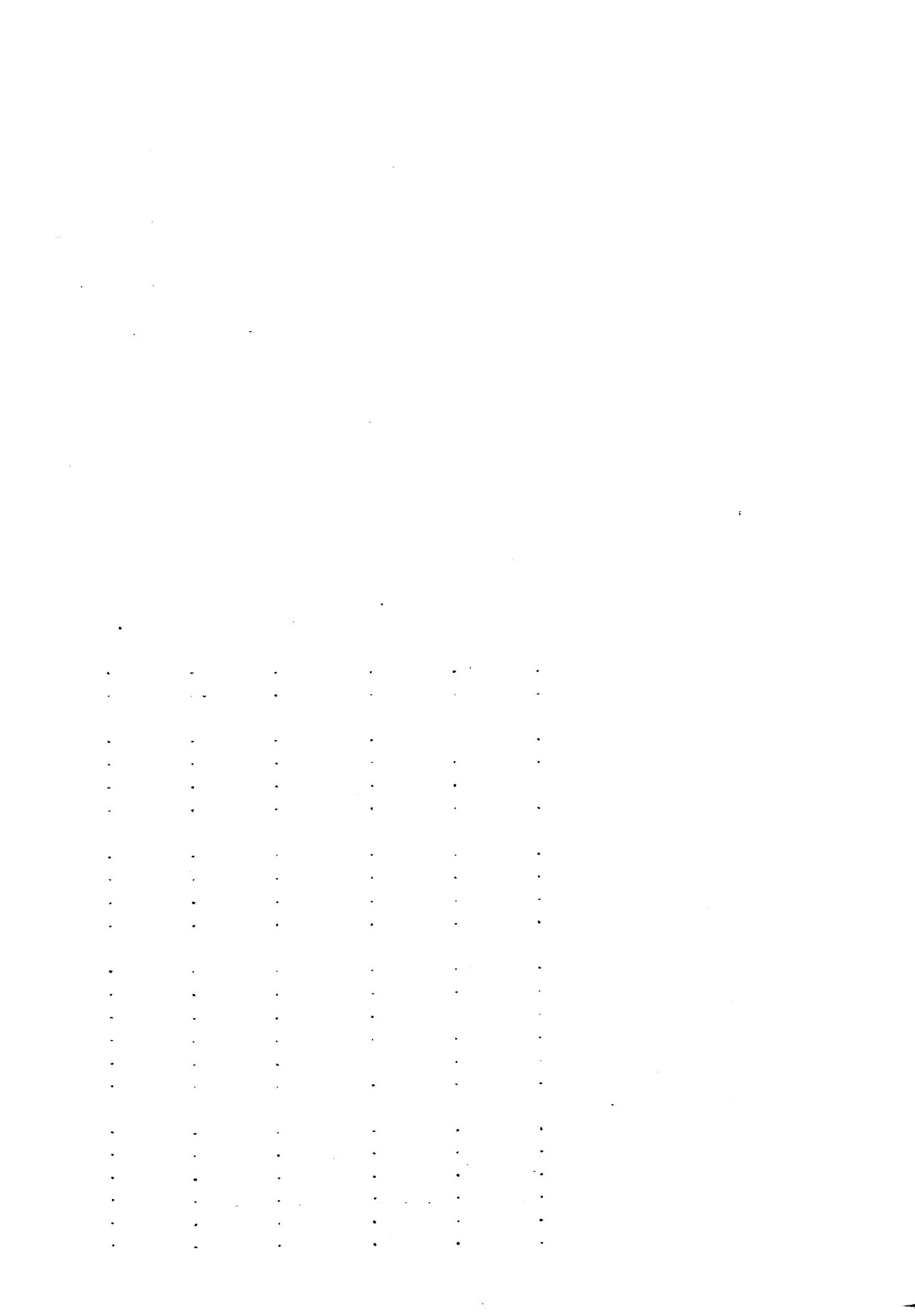
For the first time in history, the world has been presented with
the opportunity to see, through the medium of the printed page,
the actual documents, thus enabling all to know the
truth, the facts, and the real condition of the Negro, which is
free.
The following pages will give you a clear and definite knowledge of
the condition of the Negro in the United States.

the organ matter. It also follows, since the nitrogen free extract is determined by subtracting the sum of the ether extract, crude protein, crude fibre and ash from the dry matter, that since the cows agreed in the digestion of these constituents and differed in the dry matter, they must differ, also, in the digestion of the nitrogen free extract. Hence the cows agree as to the comparative digestibility of each factor of the ration except the dry matter.

Table XIII is made up in the same manner as table XI except, that the dry matter of the beets and potatoes is assumed to be entirely digested.

Table XIII.

Halo Period I	Dry matter		Ether extract	Crude fibre	Crude protein	N. Free extract
Consumed in food	111.34	6.27	4.67	22.26	15.18	62.87
Amount in beets	8.55	.88	.17	.60	1.30	5.60
" without beets	102.69	5.39	4.50	21.65	13.83	57.27
Returned in dung	37.13	3.21	1.19	11.36	5.94	16.43
Pounds digested	65.56	2.18	3.31	10.29	7.84	41.48
Per cents "	63.84	40.44	73.55	47.50	57.20	73.10
Period II						
Consumed in food	110.58	5.73	4.86	22.78	14.97	62.24
Returned in dung	40.11	3.25	1.02	11.91	5.89	18.04
Pounds digested	70.46	2.48	3.84	10.87	9.08	44.20
Per cents "	63.73	43.28	79.01	47.71	60.85	71.01
Period III						
Consumed in food	111.59	5.95	4.37	20.08	15.02	66.17
Amount in potatoes	14.16	.95	.09	.33	1.82	10.96
Amount without "	97.41	5.00	4.28	19.75	13.20	55.18
Returned in dung	44.79	3.25	1.66	13.51	6.63	20.24
Pounds digested	52.62	1.75	2.62	6.24	6.57	34.94
Per cents "	54.02	35.00	61.21	31.57	48.77	62.32
Mills, period I.						
Consumed in food	148.80	8.35	6.22	29.66	20.26	83.81
Amount in beets	11.40	1.17	.22	.80	1.74	7.47
Amount without "	136.90	7.18	6.00	28.86	18.52	76.34
Returned in dung	50.78	4.38	1.93	13.71	8.06	22.70
Pounds digested	86.12	2.80	4.07	15.15	10.46	53.64
Per cents "	62.96	39.00	67.83	52.49	56.47	70.26

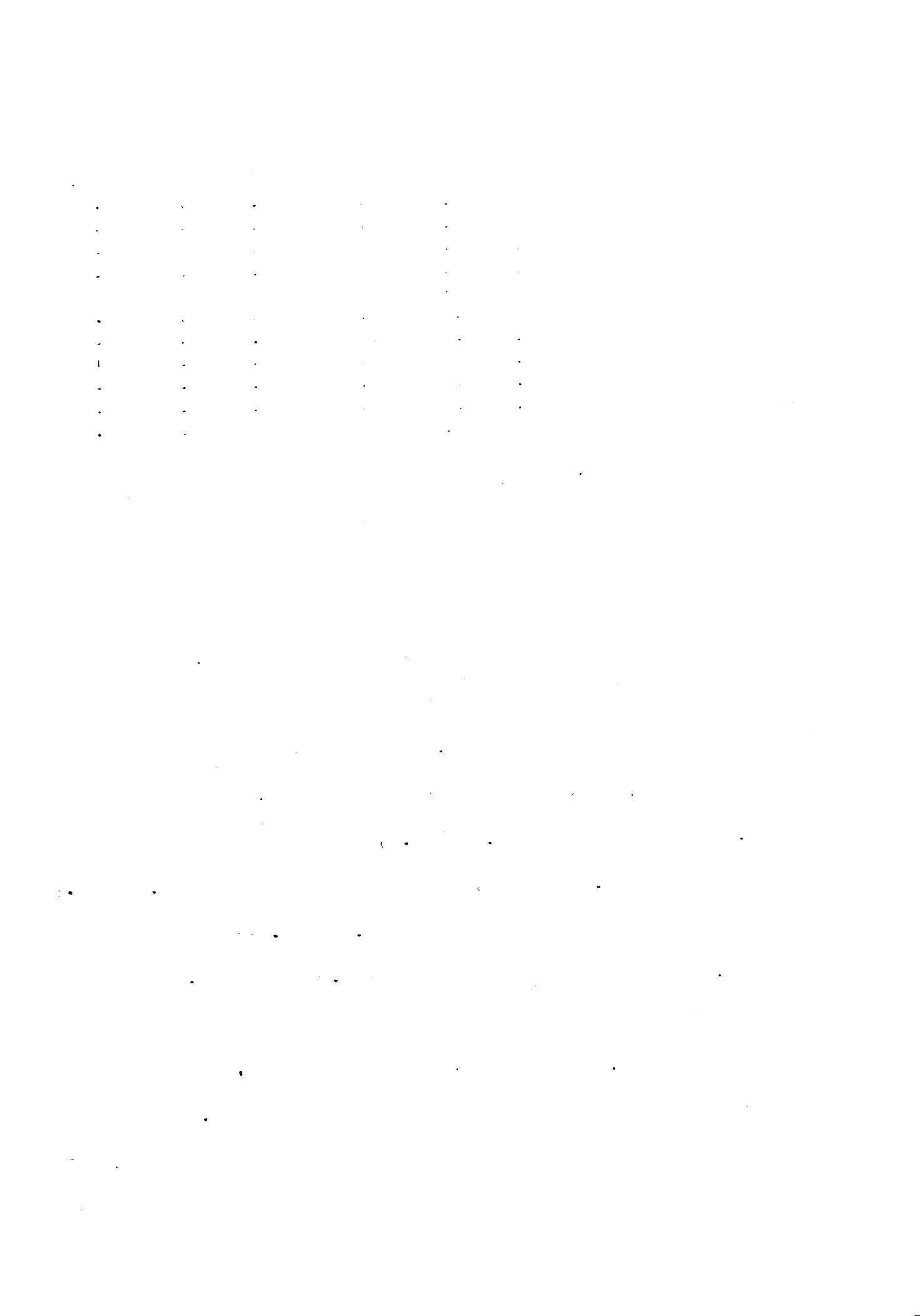


	Price	Yield	Dividend	Market Value	Yield	Dividend
Preferred Stock						
Common Stock	167.10	1.31	2.14	167.50	1.31	2.14
Common Stock	171.00	1.36	2.18	171.50	1.36	2.18
Common Stock	187.83	1.37	2.44	188.00	1.37	2.44
Common Stock	64.50	42.00	78.50	65.75	43.00	78.00
Debt Securities						
Treasury Bonds	147.00	1.37	2.30	147.40	1.37	2.34
Am. Govt. Obligations	13.00	1.37	.12	13.44	1.37	.14
Mortgage Backed	10.00	1.37	.12	10.32	1.37	.12
Corporate Bonds	43.23	1.37	2.00	43.12	1.37	2.00
Debt Securities	78.74	1.37	2.72	79.74	1.37	2.72
Total Assets	321.50	16.00	39.30	324.75	16.00	39.60

The long winter, followed by early spring, may be
the cause of the greater number of dead trees, as the
trees are more exposed to the cold winds, and the
soil is more easily washed away, leaving the roots
bare, and the trees are more liable to be blown down.
The ground is also more exposed to the cold winds,
and the soil is more easily washed away, leaving the
roots bare, and the trees are more liable to be blown down.

On the 1st of May, the author obtained 11.54 pounds of dry manure, containing 1.71 lbs. of dry matter or the best quality, gives 11.54 lbs. of dry matter; and subtract from this 57.37 lbs., the dry matter in the urine, gives us 60.56 lbs. of dry matter in all. The latter thus multiplied by 100.00 gives us 60.56 per cent. digested with the dry residue of the feces in percent dry weight of manure. The ash, the other excretions, make about 1.5 per cent. of the total weight of the manure.

Padre Tomás de la Corte, o como se le conocía en su tiempo, el Padre Tomás, ex-
hortó a los fieles a que no se quedaran sin misa en la noche del Viernes Santo.



卷之三

Wk	Day	Min Temp	Max Temp	Rainfall	Wind Speed	Wind Dir
1	Sun	40.40	70.40	0.00	10.00	NE
2	Mon	40.40	70.40	0.00	10.00	NE
3	Tue	40.40	70.40	0.00	10.00	NE
4	Wed	40.40	70.40	0.00	10.00	NE
5	Thu	40.40	70.40	0.00	10.00	NE
6	Fri	40.40	70.40	0.00	10.00	NE
7	Sat	40.40	70.40	0.00	10.00	NE

and the following day the last of the birds had been collected.

W. H. Davis, 1870, "On the Geology of the State of Florida," Florida Geol. Survey, Vol. 1, p. 13, says: "The limestone of the upper part of the Lower Cretaceous is thin-bedded, massive, light-colored, and contains numerous fossils, especially bivalves, such as *Cardium*, *Conularia*, *Leptoconchus*, *Leptostoma*, *Modulus*, *Periplanaria*, *Spirifer*, *Terebratula*, *Venerupis*, *Zygospira*, and others. The lower part of the limestone is thick-bedded, massive, light-colored, and contains few fossils, but some *Modulus* and *Leptoconchus* are found." The limestone described by Davis is probably the same as the one described by Gentry.

1922-1923. The following is a list of the names of the members of the class of 1922-1923.

The second derivative, together with its approximation, was used to calculate gradients, indicated in the computation of Figure 1.

1. The first stage of the process is the **initialization** of the surface.



Table XV.

Halo	Weight	Water	Solids	Ash	Nitrogen
Period I	30.54	91.3	8.8	3.0	1.13
	47.0	91.3	8.2	2.52	1.04
Period II	30.75	91.1	9.0	2.6	1.06
	30.00	91.76	8.25	2.8	1.14
Period III	59.25	94.42	5.58	1.6	.55
	57.75	94.36	5.64	1.4	.56
Total weight of each					
Period I	77.5 #	70.96%	6.54%	2.09%	.83%
Period II	60.75	55.23	5.52	1.63	.63
Period III	117.00	110.44	6.56	1.76	.65
Milla					
Period I	39.00	91.3	8.8	2.71	1.08
	31.75	90.6	9.2	3.00	1.14
Period II	35.25	90.73	9.27	3.50	1.12
	33.50	91.46	8.54	3.13	1.25
Period III	53.25	93.6	6.4	2.25	.71
	29.25	91.11	8.89	3.00	.93
Total weight of each					
Period I	70.75#	64.40%	6.35%	2.01%	.78%
Period II	63.75	52.62	6.13	2.28	.81
Period III	87.50	80.96	6.54	2.21	.69

The amount of urine in period I is a little more than in period II with both cows, and a great deal more in period III than in either period I or II. With the water contents similar conditions exist.

There is some variation in the nitrogen. Halo returned more in period I than in either period II or III, and more in period II than in period III.

Milla returned more in period II than in either period I or period III, and more in period I than in period III. In period III, when so much urine was produced, the per cent of nitrogen was very small.

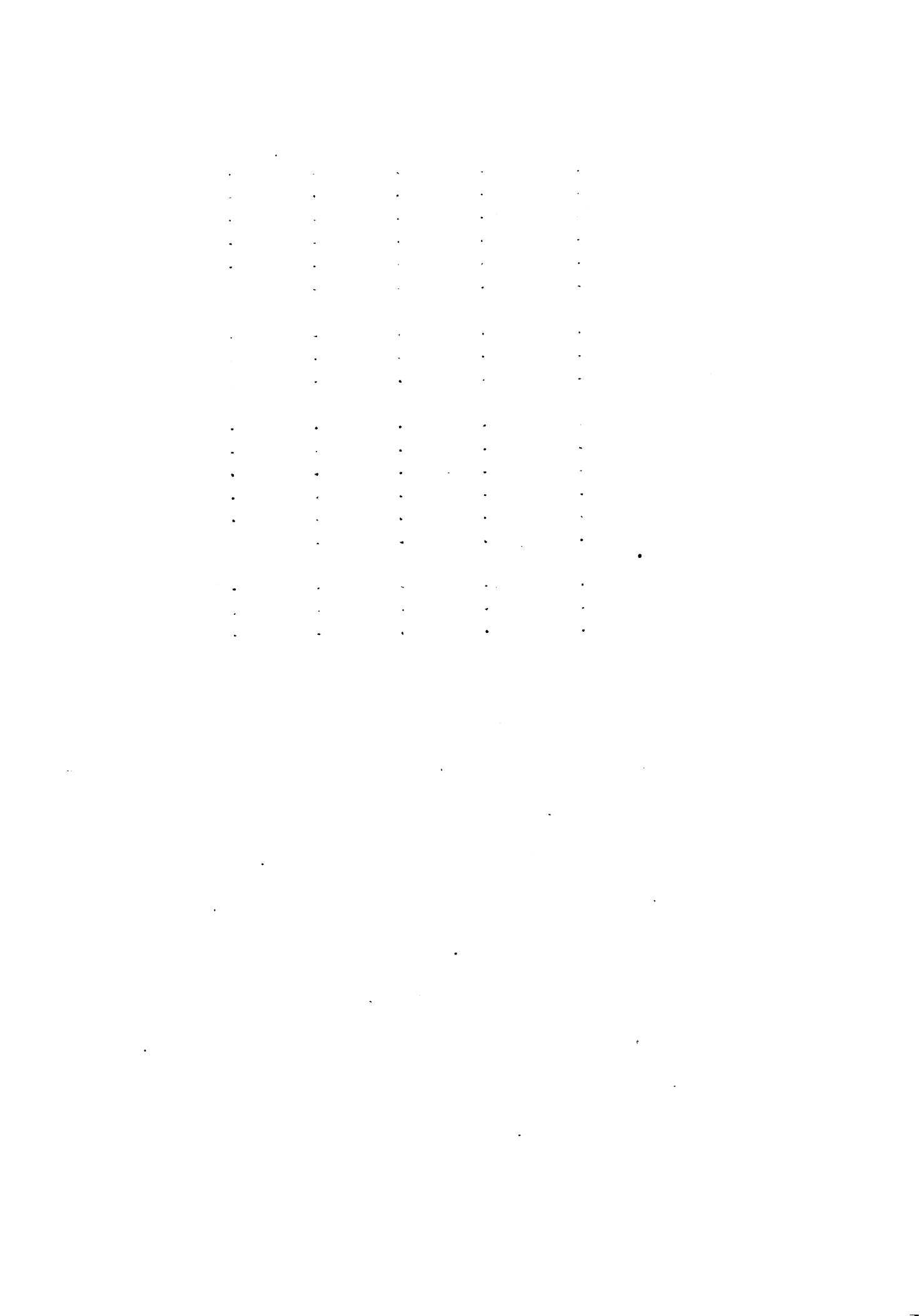


Table XVI gives the weight and per cent of dry matter, the ash, and the nitrogen in the food consumed, and in the dung, urine and milk returned. It also gives the amounts and per cents of each account for.

Table XVI.

Halo	Dry matter		Ash		Nitrogen	
	Pounds	%	lbs.	%	lbs.	%
Period I						
Consumed in food	111.84		6.27		2.43	
Returned in dung	37.13	33.38	3.21	51.19	.95	39.09
" " urine	6.54	5.87	2.09	33.33	.83	34.15
" " milk	14.09	12.67	.73	11.64	.56	23.05
Accounted for	57.76	51.92	6.03	96.18	2.34	96.38
Period II						
Consumed in food	110.58		5.73		2.40	
Returned in dung	40.11	36.26	3.25	56.72	.94	39.17
" " urine	6.52	4.98	1.68	28.76	.68	28.33
" " milk	14.45	13.07	.78	13.63	.53	22.09
Accounted for	60.08	54.34	5.66	96.81	2.15	89.59
Period III						
Consumed in food	111.59		5.95		2.40	
Returned in dung	44.79	40.14	3.25	54.63	1.06	44.17
" " urine	6.53	5.88	1.76	29.57	.65	27.06
" " milk	15.27	13.65	.73	12.27	.56	23.33
Accounted for	68.82	59.67	5.74	96.47	2.27	94.58
Milla						
Period I						
Consumed in food	148.30		8.35		3.25	
Returned in dung	50.78	34.25	4.38	52.45	1.29	39.62
" " urine	6.55	4.29	2.01	24.07	.78	23.97
" " milk	19.51	13.15	1.26	15.04	.76	23.40
Accounted for	76.84	51.69	7.64	92.56	2.83	87.08
Period II						
Consumed in food	144.80		7.51		3.13	
Returned in dung	51.32	35.44	4.16	55.39	1.26	40.22
" " urine	6.13	4.24	2.28	30.37	.81	25.88
" " milk	19.18	13.24	.83	11.05	.72	23.00
Accounted for	76.74	52.92	7.27	90.81	2.79	88.10
Period III						
Consumed in food	147.80		7.87		3.19	
Returned in dung	49.36	33.37	3.98	50.57	1.34	42.01
" " urine	6.54	4.42	2.21	28.08	.69	21.63
" " milk	20.08	13.57	1.30	16.52	.79	24.77
Accounted for	76.76	51.36	7.49	95.17	2.82	88.41

The food during digestion undergoes a series of chemical changes. The body must be supplied with the necessary warmth and this heat comes from the food being burned in the body, and in the process of combustion the products become gaseous and are given off in considerable quantities in respiration and through the pores of the skin.

With Halo, in periods I, II and III we have accounted for of the dry matter, respectively, 51.83 ′, 54.34 ′ and 58.67 ′; with Milla, likewise, we have 51.68 ′, 53 ′ and 58.24 ′. Hence we see, a great loss with no very great variation, except in that Halo gives a little more in period III than in either period I or II.

The per cent of ash and nitrogen accounted for is, for the most part, pretty uniform and is nearly all accounted for.

With each cow there is a uniform increase in the return of nitrogen in the manure in the three successive periods. With Halo it is 39.09 ′, 39.17 ′ and 44.17 ′, with Milla 39.62 ′, 40.22 ′ and 42.61 ′ respectively.

In the urine Halo gave a constantly decrease of nitrogen in the three successive periods, 34.15 ′, 28.33 ′ and 27.08 ′ respectively. Milla gives 23.97 ′, 25.88 ′ and 21.63 ′.

Therefore, we conclude that when beets or potatoes are added to the basic ration, if we consider the dry matter of the beets and potatoes no more digestible than the dry matter of the basic ration, there is a greater per cent of the constituent elements of the ration digested when beets are



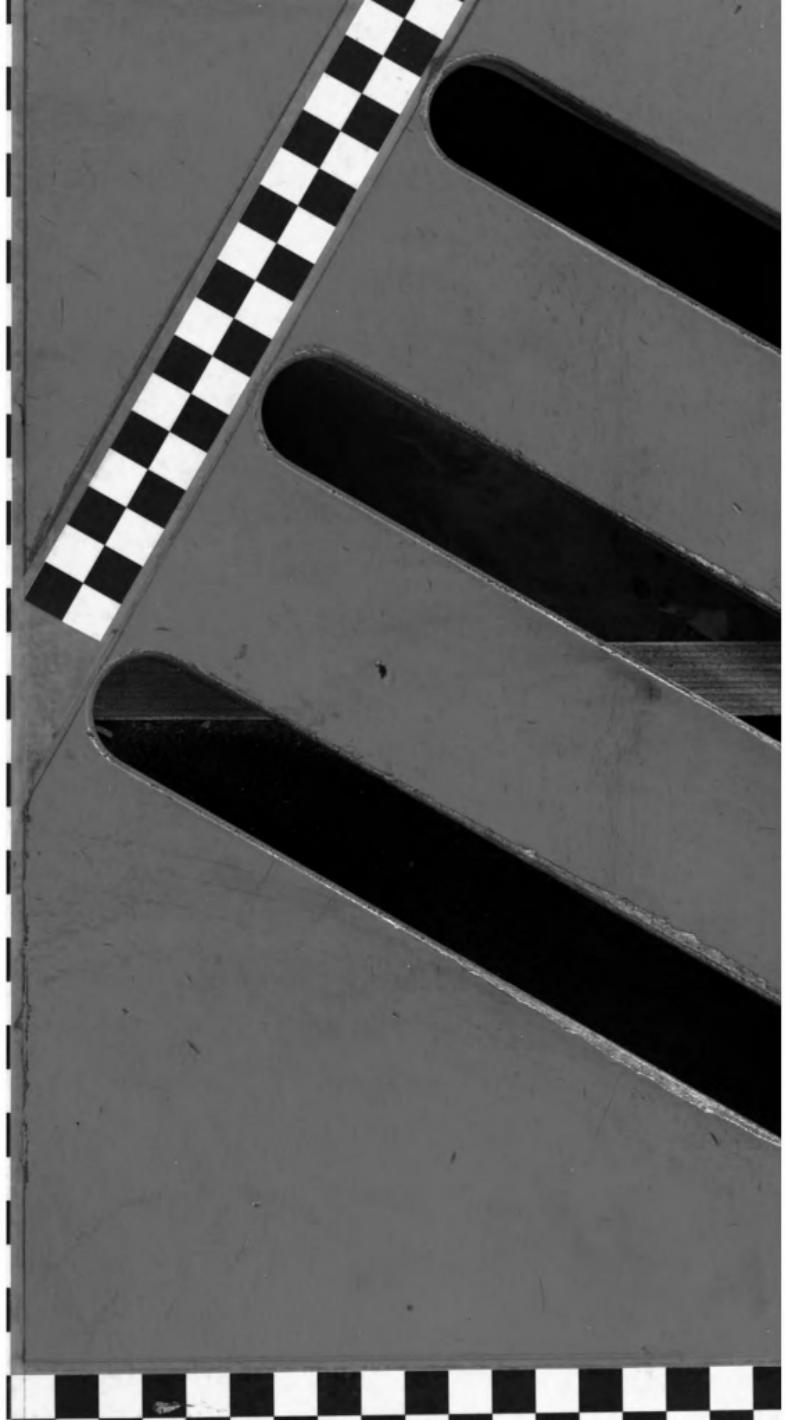
added than when bran, corn meal and clover hay constituted the ration, while when potatoes was added a less per cent was digested.

But if we consider the dry matter of the beets and potatoes as fully digested, then a much less per cent of the dry matter of the ration is digested when beets are added and a far less per cent when potatoes are added.

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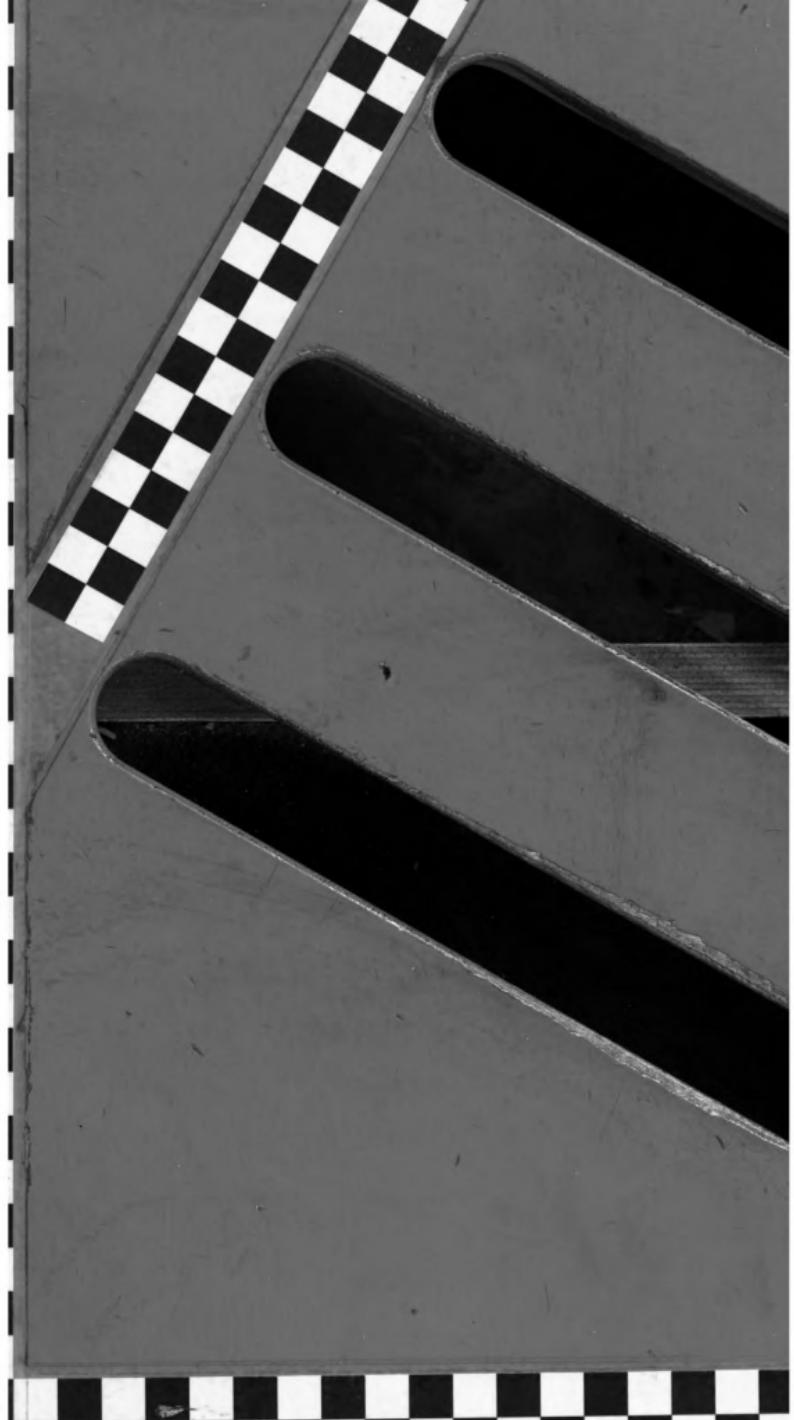
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