definite and conclusive than might have been anticipated. Nor can there be any doubt that if experiments were made with oxen, under suitable conditions, they would yield equally conclusive evidence on the point. Indeed, as anticipated by Henneberg in the observations he made at Hamburg in 1876 we may consider that the carbohydrates are reinstated in their position in the formation of the fat of ruminants as well as in that of pigs.

SUMMARY ON THE SOURCES OF THE FAT OF THE ANIMALS OF THE FARM.

It was in 1865 (that is, nearly thirty years ago) that Voit first called in question the then very generally accepted opinions on the subject; and, as his evidence, derived from experiments with the omnivorous dog, accumulated, he more and more urged that his conclusions were equally applicable to Herbivora. His views on the point came to be very generally adopted by agricultural chemists in Germany, and, in 1874, Prof. Emil von Wolff adopted them, but with some reservation so far as pigs are concerned, in his text-book, entitled. "Die rationelle Fütterung der landwirthschaftlichen Nutzthiere, auf Grundlage der neueren thierphysiologischen Forschungen."

It has been already stated that in the discussion at Hamburg in 1876, Wolff more clearly admitted that pigs might behave exceptionally in the matter; whilst Henneberg assumed that ruminants also would prove to be exceptions to the application of Voit's views.

Since that date a number of experiments have been made in Germany and elsewhere, both with pigs and with ruminants, to elucidate the point; and when the conditions of the experiments were suited to the object the results contributed to the REESTABLISHMENT OF THE CONCLUSION THAT THE CARBOHYDRATES PLAY A VERY DIRECT AND IMPORTANT PART IN THE FAT FORMATION OF THE ANIMALS OF THE FARM.

Further, in the edition of Wolff's work published IN 1885, HE ALMOST UNRESERVEDLY ADMITS THE ROLE OF THE CARBOHYDRATES IN THE FORMATION OF AT LEAST A GREAT PART OF THE FAT, NOT ONLY OF PIGS, BUT OF RUMINANTS. Indeed, some years previously Voit himself had made substantial concessions on the point.

It happens, however, that about 1880 Dr, Armsby, now the director of the agricultural experiment station at the Pennsylvania State College, published a work entitled, "Manual of Cattle Feeding; a Treatise on the Laws of Animal Nutrition, and the Chemistry of Feeding Stuffs, in their Application to the Feeding of Farm Animals," which was a very good digest, chiefly of the work done in Germany, on the subject.

So far as the question of the sources of fat is concerned, it gives numerous tabular illustrations from Voit's work; and it follows almost exclusively the views of Voit and of Wolff at that time. He, however, quotes results obtained both with pigs and with other animals, which he admitted indicate, according to the figures, the formation of fat from the carbohydrates. But he considered that the data at command were not sufficient to solve the problem, and, with Wolff, assumed that the question could not be satisfactorily settled without experiments in a respiration apparatus. He also considered that estimates founded on the composition of the increase of fattening animals as determined at Rothamsted are uncertain. He nevertheless concluded that the carbohydrates may serve as a source of fat to swine, and under some circumstances to other animals also.

It happens that Dr. Armsby's book, founded to a great extent on Wolff's earlier editions, is the only work of the kind in the English language; and hence many of the rising generation of agricultural chemists, both in this country and in America, have adopted the view that the albuminoids are the main, if not the exclusive, source of the fat of our farm stock and of the butter of cow's milk.

Under these circumstances it seemed desirable to consider in some detail both the experimental evidence bearing upon the question and the discussion which have taken place in regard to it during the last quarter of a century or more. IT MUST BE ADMITTED THAT THE IMPORTANCE OF THE CARBOHYDRATES AS A DIRECT SOURCE OF MUCH, IF NOT OF THE WHOLE, OF THE FAT STORED UP IN THE ANIMALS WHICH THE FARMER FEEDS HAS BEEN CLEARLY REESTABLISHED. I have reason to believe that Dr. Armsby himself adopts the change of view, though IT WILL PROBABLY BE SOME TIME BEFORE THE TRUTH IS THOROUGHLY RECOGNIZED BY THE YOUNGER AGRICULTURAL CHEMISTS.

(To be continued)

Household Matters.

1897.

Thoughts for the season — Earnings confiscated — Garments — Hints — Kitchen-helps — Good thoughts.

As usual, at this time of the year when people are feeling in good spirits after the gaieties of the season, many say to themselves: I am going to turn over a new leaf, and not have to regret what I have done in the past. Happy the person who can say this and stick to it.

Few of us I fear can reflect on the past, without finding some big flaw in our lives, that might have been prevented with a little care and thought on our part.

So let us turn over the new leaf and keep it so pure and clean, that we can have the pleasure of looking back and saying, my time has been well spent.

The youth of to day require very different treatment to that of their forefathers, who were brought up in an atmosphere of respect for their elders, mingled, with a wholesome amount of fear.

Progress in every stage of life has altered all this, and the young people of to day are young men and women at an age when their fathers and mothers were children.

It is pardonable pride when young people work for wages for the first time to have a wish to receive it into their own keeping, to look at, and realise that their labour has become of some value.

It is rather hard for one to see his or her earnings taken by the father or the mother.

I have seen a few cases of this kind, and I did not like the look the girl gave her mother on these occasions.

It was rather hard, after having worked during the summer and earned what to her seemed a large sum, not to have the pleasure of looking at it and feeling it was her very own. They might have trusted to her good sense not to keep the whole.

In this case, the girl left home, and came to town where she could earn and spend her wages just as she liked, and she did it with a vengeance.

Never having handled money, she did not know how to spend it, and the consequence was that at the end of a year she had very little to shew for her spending.

WINTER WOOLWORK. Now is the time to employ our hands once more with the making of some warm and, therefore, welcome trifles for our friends or ourselves, so we will consider one or two useful things of the kind.

KNEE-CAPS.—These directions are for ladies' size. Berlin wool can be used, though some prefer the fleecy; for my own part, I find the former quite sufficient, both for warmth and size. Take rather large-sized steel needles. Put on twenty five stitches. Do four rows of plain knitting and purl alternately. Then reverse them, so as to form ribs. When three of these ribs are complete, commence in the centre of the fourth one to increase (purl will then be facing you) by making one stitch on each side of the centre one. Then continue the remaining twelve as before to the end. Turn, and work the row right along to the end, purling. Next row, facing, do as before, by increasing by one stitch at the end and beginning of the twelve at the edge. Notice, these twelve stitches must be kept intact all along, from the commencement of the knee-cap to the finish, and one increasing stitch is made at their edge every time the purled centre faces you.

There will come to be forty-four stitches of centre-purling at last, together with the commencement of the sixth rib of plain, which is the eighth on the needle altogether. This is the top. On reaching it, the four rows of the rib at the edge must be done plain and equal in number; that is to say, the standard twelve at the edges and forty-four purl in the centre. On commencing the next ridge at the centre (to correspond with the former increasing) decreasing begins, being worked as usual at the commencement and finish of the standard twelve, so as to go downhill in the same manner as up. It will soon be seen now how to proceed, as the plan is clear enough.

On arriving at the last twenty-five stitches continue, of course, as before to match, and finish with three ribs as at first. When complete, stitch together. Very possibly for men's knee-caps bone needles will require to be used instead of steel ones, with fleecy wool, but I have never made any myself, though I have of course seen some. I would say that if these directions prove puzzling to anyone I shall be very pleased to correspond about them if written to. It is very difficult to explain in this manner. I ought to have added that the above takes 2 oz. of Berlin wool.

Correspondence.

The following letter is quite correct in its statements, but unfortunately they are founded in a misconception. Mr. Stockwell is speaking of "the best milking strains of Shorthorns," we spoke of "Dairy-Shorthorns," i. e., unpedigreed stock, such as is for sale every season at the Northern and Lincolnshire fairs and in Islington, London, market. Two very different things.—Ed.

Danville, Que., Dec. 15th 1896.

A. R. J. Fust, Esq.,
4 Lincoln Avenue,
Montreal.

In a foot note in connection with Mr. McCallum's interesting letter in this month's Journal you make the statement that "there is not a dairy Shorthorn in the province of Quebec."

Well if there are none in Quebec there is none on the continent of America.

It seems rather hard on the few of us here and elsewhere who have been doing our best to improve the stock of the country to be told that we are not "in it to", use a slang phrase.

Mr. C. C. Cleveland, late member for this and the adjoining county has spent both time and money, introducing the best Shorthorn blood he could find.

Mr. H. Elliott who has been so successful in the show ring has done the same.

I have done my best to secure the best milking strains of Shorthorns to be found. I purchased "Red Princess" who has many a time given me as much milk in a day as the average of the seventeen cows at the London (Eng.) show. She is a daughter of "Fair Maid of Hullet 2nd" No. 9047 whose record for ninety days at the World's fair in the butter test was a net profit of $44.88.

My young bull "Christopher Columbus", dropped at the fair, is a son of "Waterloo Daisy" whose record in this same butter test netted a profit of $48.66.

Now if stock from such a foundation cannot be classed as dairy Shorthorns I think you will have to admit that they are not to be found on the continent.

Could you not make an effort to come out to this section of the country and see for yourself what we are trying to do I think you would be pleased to see the spirit of progress amongst quite a number of our farmers and breeders, I am credibly informed that at least three silver medals are coming to this town and perhaps a gold one. You might change your ideas to some extent at least and we want to merit your good opinion.

J. N. Greenshields, Esq., of your city as well as the forementioned gentlemen and several others in a smaller way have done a great deal of good in improving the stock of cattle sheep and pigs in this section of the country and indeed all over the Dominion. Whilst G. K. Foster, Esq., has done his share in horses. We all get plenty of criticism from ordinary farmers for paying such prices for good foundation stock and we naturally expect such men as you to encourage us all you honestly can.

Come then and see us, write me when you are coming, I will meet you and drive you around and I assure you we will do our best to entertain you.

C. F. STOCKWELL.

To Arthur R. Jenner Fust.

Sorel, December 25th, 1896.

DEAR SIR,

We have finished threshing our grain, and, to my great satisfaction, I beg leave to say that we are astonished at the yield. We have:

750 bushels of oats;
260 " " barley;
50 " " pease.

1060

and all this on 23 arpents of land, i. e. 46 bushels to the arpent, (55 bushels, nearly, to the imperial acre!)

This is a proof that when one receives good advice—and follows it—one is always repaid for the trouble.

Most faithfully yours,

SERAPHIN GUEVREMONT.

(From the French.)