color and is absolutely waterproof. The writer has taken one of these tiles and raising a border or frame of putty around it, poured water on, allowing it to stand for five or six days. No trace of moisture showed itself underneath any more than it would on a glass or thoroughly vitrified tile. A common roofing tile must be of exceptionally good quality that will not, under such a test, show beads of water on the under surface within an hour.

The silver gray tile is, briefly, a burned clay tile carbonized throughout, the graphite-like carbonization being produced at the conclusion of the burning process, somewhat as salt glazed ware is glazed when the burn is finished. The method of doing this we will now proceed to describe.

The tile may be of any shape or make, hand made, pressed or auger machine made. Very conveniently shaped are the corrugated tile which, when set in the kiln, give only small points of contact and at the same time form a number of tubes, through which the carbonizing vapor (blue smoke) can circulate. But any shape or kind of tile that can be burned can be "blue smoked."

Opinions differ as to the best size for the kiln. One authority, Jacob Buhrer, considers the kiln should be small, holding about 8,000 pressed or 10,000 auger machine tile. Though he admits it is very much a question of the amount of heat the clay will bear without falling down, and that kilns should be smaller for ware which burns very easily, while if the clay holds up well the kiln can be larger; but another authority, C. Jungst, contests this, citing the practice of the Freienwalder works, where the kilns hold 20,000 pressed lock-joint tile and give perfect results.

It is obvious that only tile can be burned in a kiln at one time and it takes two or three burns of ordinary ware before the tar, with which the kiln walls are saturated, is got out, and front, ornamental or glazed brick, can be burned without fear of discoloration. The time occupied in burning a kiln of silver gray tile is about as follows: 1½ days for setting, 3 days for water smoking, 1½ days for full heat burning, 6 to 7 days for cooling, 1 day to empty kiln: total, 13 to 14 days.

It is found an advantage to build the kilns, which are only fired from one side, in pairs back to back and run the two at the same time. These are the smaller kilns as worked by Buhrer, and the consumption of fuel (coal) is about four tons each. The chief burner must thoroughly understand his business and know how to raise the temperature to an equal degree throughout the entire mass of the ware. The more equal the temperature, the nearer perfection is the silver gray gloss, which should be alike on every tile in the kiln. It is advisable, and is, in fact, the usual course, to finish up the firing and get a white heat of equal intensity throughout the kiln, with small shingled or split wood, and it is very important that trial pieces be freely used, for without these, mistakes are very likely to be made.

The burning being complete and the chief burner seeing that he has an equal heat throughout the kiln, on the furthest side the same as near the fire, the next operation is to hermetically close the kiln as quickly as possible. Wet or damp sand has been previously heaped up at the fire boxes, as high as the doors. An assistant stands ready on the top of the kiln with a pail of daubing mud and a quantity of damp sand. The burner then throws about eight to ten shovelfuls of slack upon each fire, quickly shuts the doors and calls to his assistant to close the damper. This is done at once, daubed with mud and a layer of about eight inches of sand thrown on.

By this time the burner has completed the closing of the doors with sand; the peepholes in the roof have been closed and covered with sand. All this work must be done very smartly, as it is an advantage to hold the smoke or vapor in the kiln, which comes from the slack just thrown in. The kiln is then allowed to stand for half an hour to an hour and a half, so that the glow of the fire is equally distributed or, as burners say, "the fire settles." The time necessary for this is a matter of experiment and largely depends upon the size of the kiln. As a general rule, one hour is enough; after an hour and a half the heat falls too much

Everything being ready and there being not an opening or crack or fissure in the kiln by which air can enter, the tar or oil is poured into the kiln. This is put in through siphon-shaped funnels, of which an illustration is given here.

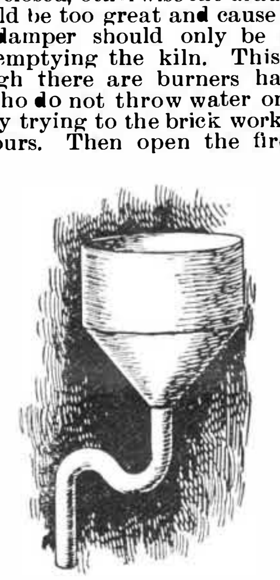
The object of the bent tube is to prevent admission of air at the time of pouring in the oil. Assuming that we use common coal or gas tar, seven pailfuls will be poured in, each pail holding between ten and eleven quarts. The tar or oil must not fall directly on the tile. When setting the ware two spaces are left, one each side of the kiln, and a layer of single brick arranged for the tar or oil to fall upon and vaporize. Two funnels are put into holes provided for them in the roof of the kiln. The joints well luted and further protected by wet sand. Half the blue-smoking material is poured into one funnel, half in the other. In three hours' time another seven pailfuls is poured in; this is done four times in all, so that the total quantity of tar used is about seventy-four gallons. It might be supposed that this great quantity of liquid tar, or oil, would spoil the contents of the kiln, but this is not the case. From the time the oil is first poured in, the sand, with which the roof is covered, is kept wet. If a row of kilns, say ten or twelve, are always used for blue-smoked tile, it is well to have water laid on permanently through an inch or inch and a half iron pipe along the kilns at the height of the roof, with branches at each kiln, upon which a rubber hose can be fixed. Where such an arrangement is not used, water is thrown on the kiln, five pails of water every hour and a half, day and night, for thrice twenty-four hours, then every two and a half hours until the kiln is cool enough to open.

For a set of ten or twelve kilns, each holding from 3,000 to 4,000 tile, two burners and two assistants are enough for day and night service and are able to burn from twenty-three to thirty kilns per month. The assistants, in addition to helping when closing the kiln, wheel the fuel, clear away the ashes, close and open the kiln doors, and keep the sand damp on roof and other places where it is used for sealing all openings.

The pouring in of the oil should, if possible, be done by the chief burner himself, so that he may be quite certain the right quantity is used, and for this operation of pouring in the oil or liquid tar, a watering can, from which the rose has been taken off, is more convenient than a pail.

As for the cooling of the kiln, the quicker this can be done the better, but we reckon it to take seven or eight days. When it is believed that all the fire is dead, the opening of the kiln is commenced, very carefully and very tentatively at first, for the kiln must absolutely not be opened so long as there is the least chance of the vapor in it igniting, as this would ruin the color and appearance of the tile. The fire doors are opened one at a time and as little as possible, sufficiently to draw out the ashes, for these hold the fire longest. This work should be finished quickly. The burner then goes on the roof, one of the peep holes is opened (there are usually three on a kiln twenty-five feet long). He cannot see into the kiln, in consequence of the vapor which continually rises, but the hole is left open for about five minutes, when, taking a sack he strikes some smart blows with it upon the mouth of the hole, when he will very soon see if there is any fire in the kiln, for sparks will come out of the hole and these can be seen very plainly at night. If sparks appear, the opening must be closed at once, and covered with sand and the fire doors daubed tightly.

In an hour's time this can be tried again, but if no sparks are seen, the further opening of the kiln may be proceeded with. All the view holes are opened and the sand packing is removed from the kiln door and a small hole is broken through the inner door. In three hours' time this hole is enlarged, and after a further six hours the whole of the door can be broken down, so that the setting is seen. Up to this time the fire door and chimney damper remain closed. After waiting another six hours the fire doors can be opened a little, but care must be taken not to open up too quickly, particularly if the clay is of such a nature that it will not bear rapid cooling, for the bottom rows of tile which lie on the flue openings will craze and fly. Six hours later the fire doors can be all quite open, so that after twenty-one hours' cooling, the outer air streams through the kiln; but even then the chimney damper is kept closed, otherwise the draught or current of cold air would be too great and cause chills or cold cracks. The damper should only be opened a few hours before emptying the kiln. This is the usual practice, though there are burners handling much smaller kilns who do not throw water on them, which is of course very trying to the brick work, but wait for seventy-two hours. Then open the fire doors, after



this the kiln doors, beginning at the bottom, are opened by degrees. The kiln stands like this for a time, then the chimney damper is opened. This creates a strong draught, and in about another twenty-four hours the kiln is cool enough to empty. But this plan, it should be observed, can only be adopted with certain kinds of clays.

As to which are the most suitable clays for the blue-smoking process, this, too, can only be determined by experiment. The prevailing opinion that a considerable quantity of iron must be present in the clay is a mistake. The method used at Tegeln, in Holland, which we propose to fully discuss in a future article, possibly requires that iron shall be a constituent, but where the blue smoking is done with liquid tar or oil, iron is not necessary, and it is found that clays containing lime, burning a yellow color, and even pure kaolin, will take the finest silver gray color. This process is specially adapted to clays which, when burned, prove very porous, but we must caution our readers against assuming that any and every clay will do. Tiles made from certain clays, apparently thoroughly sound, with a good ring, and free from craze or crack, have been found unable to withstand the first severe winter. An analysis of the clay will not tell us whether it will give a good tile; experiment alone will do this, and the test is better made by some disinterested and impartial person. A half dozen or so average specimens of the tile can be sent to a chemical laboratory, where the testing of clay is a specialty, and they would be submitted to all the destructive influences which nature would bring to bear in the course of years. If the cost of such a test is objected to, and time is of little importance, the tile maker can carry out his own test by putting up a small roof, which should be in the most exposed position that can be got, and if, after the second winter, the tile is found to be absolutely unchanged, the production of them on a manufacturing scale may be commenced with confidence.

The cost of manufacturing silver gray tile in Germany has been found to be $1.80 per thousand more than the same tile burned red in a continuous kiln, which is, of course, the very cheapest way of burning. The items are as follows:

Extra cost per M for labor	$0.42
Tar or oil	.53
Extra coal	.85
	$1.80

A prime condition of success is the selection of an intelligent and careful chief burner, who knows his business, and who will insure the kiln being absolutely air-tight during the blue smoking process, but he must be given the right materials to work with, or failure may be due to causes over which he has no control. The oil (we are not now speaking of liquid tar) which is mostly refuse from the oil refineries, may contain injurious constituents producing minute cracks in the tile, cracks so small as to be invisible to the naked eye. The tile may even ring, but it will not last over one severe winter. In one car load of oil there may be some barrels of a more inflammable character and which do not possess the property of quickly deadening the fire; in such case a larger quantity of the oil must be used or the ware will not be perfect. Coal which does not produce a long flame will be found to be unsuitable for the blue smoking process, the more so that the kilns are fired from only one side. Where this is the only fuel obtainable, it has to be supplemented by the use of a considerable quantity of split wood, and the burning must be finished entirely with this wood.

This brings us to the question of the most suitable fuel. Our manufacturers in many parts of the country possess exceptional advantages for burning fine ware, such as roofing tile, in a plentiful supply of a most admirable fuel, crude oil.

We have no doubt crude oil would prove the very best fuel for the work described above, combining in itself the advantages of coal and wood, and we anticipate that crude oil would perfectly supply the place of coal tar or the oil refinery refuse used in Germany for the actual blue smoking.

By using fuel oil we should expect, if the burning and blue smoking is properly done and the clay is not very difficult to handle, that it would not be a question of what percentage of good ware could be got from the kiln, but that every tile would be a good and salable article and all be of equal color.

A tile such as is here described would, we feel sure, be a welcome variety to architects and command a ready sale.

We know well that the dark and neutral tinted slate and the subdued tones of old shingle or thatch are the most satisfactory roofing materials, so far as appearance goes, and are a great ornament to a building.

The facade of a house may be rich and imposing, or chastely beautiful, but if the roof be yellowish white or pink or pale red, the value of the whole, as an artistic effort, is diminished.

A dark red tile is far better; but it is undeniable that a neutral tint is the best of all and a roof so tinted is a finish and a frame to the rest of the architectural picture and a neutral color tone is the more desirable if the surface of the roof is broken by **turrets, returns** or dormers.

SILVER ALLOYS.

By G. J. Fowler, M.Sc., and P. J. Hartog, B.Sc.

The following notes form a record of some experiments undertaken* for the purpose of obtaining a silver alloy, which should possess the whiteness of silver, without its liability to tarnish, and should also be capable of electro-deposition. Our endeavors proved unsuccessful, but the results obtained are of some interest. Our experiments fall into two divisions:

(I.) The preparation of alloys by fusion of their constituents.

(II.) The deposition of alloys by electrolysis.

(I.) Some time ago a company was formed for electro-plating with an alloy of silver and cadmium, which was stated to be much less tarnishable than silver. For various reasons the company did not meet with great success, one being, doubtless, that the expectations with regard to the alloy were not realized in practice.

We have found indeed in all cases that the silver alloys we prepared were more easily tarnishable than pure silver; on the other hand, a sulphide stain is in general more easily removed from the alloy than from the metal. We tested the alloys by the following rough but efficient means: two drops of ammonium sulphide were placed on the burnished surfaces of the alloy and of pure silver, respectively, at the same time, and removed at the same time, after an interval of a minute or two. It was then evident in all cases that the stain on the alloy was deeper in color than that on the silver, while it was in general more easily rubbed off with a piece of chamois leather.

It is of course well known that silver sulphide forms a particularly good and tenacious coating on silver; it was to be expected that a heterogeneous mixture of sulphides would be less tenacious. The following lines contain a brief description of the alloys prepared.

1. Silver Zinc Alloys.—The zinc was melted in a crucible under powdered charcoal, the molten silver added, the mixture stirred with an iron rod and poured into a mould.

(a) Ag 95 per cent., Zn 5 per cent. Color somewhat grayer than that of pure silver, but not easily distinguishable from it.

(b) Ag 93 per cent., Zn 7 per cent. Color easily distinguishable from that of pure silver.

(c) Ag 90 per cent., Zn 10 per cent. Still malleable, but grayer.

2. Silver Nickel Alloys.—These were obtained by melting the two metals together in a wind furnace under a layer of charcoal, stirring and pouring into a mould.

(a) Ag 95 per cent., Ni 5 per cent. Color was good, silver-like, and the alloy takes a high polish.

(b) Ag 90 per cent., Ni 10 per cent. Color was "steely," the alloy malleable.

Both these alloys tarnish readily, and the stain is not very easily removed from their surface.

3. Silver, Nickel, and Zinc Alloy.—Ag 90 per cent., Ni 5 per cent., Zn 5 per cent. The silver and nickel were melted together and poured on to the molten zinc, the contents of the two crucibles being covered with powdered charcoal. Color too gray, malleable.

4. Silver Aluminum Alloy.—Ag 90 per cent., Al 10 per cent. This alloy was highly crystalline and brittle; it broke to pieces on rolling. The surface was white and highly lustrous, but readily tarnishable.

5. Silver Tin Alloy.—Ag 95 per cent., tin 5 per cent. (by analysis).—According to Hiorns (Mixed Metals, 320), "the smallest quantity of tin renders silver brittle." This alloy is, however, perfectly malleable, yielding long spiral drillings. It has an excellent color and **yields stains which are easily removable. Unfortu-**

* At the suggestion of Messrs. Levetus Bros., of Birmingham.

nately tin is not easily deposited by the current, and the alloy is therefore unsuitable for our purpose.

6. Silver-Copper-Zinc Alloys.—In this case the silver and copper were melted together and added to the zinc, the operation being in other ways similar to that described previously.

(a) Ag 75 per cent., Cu 15 per cent., Zn 10 per cent.—Color too yellow. Malleable. Stain readily removable.

(b) Ag 67·87, Cu 5·17, Zn 27·47.—Showed signs of brittleness on rolling; color yellow and wanting in brilliancy. This alloy was analyzed, and it was found that by operating in our usual way that no loss of zinc was incurred.

(c) The above alloy was melted with a further quantity of zinc till the fracture was highly crystalline and of a bluish white color. The percentage of silver was found on analysis to be 30·74.

Electro Deposition of Alloys.—The efforts of technical chemists have hitherto been directed to the separation of metals by electrical methods, rather than to their deposition simultaneously; but for some years the electro-deposition of brass and other alloys has become a commercial process. The mechanism of the process, however, is by no means easy to understand. An interesting but incomplete note on the subject is due to Dr. Silvanus Thompson (Proc. Roy. Soc., 42, 387, 1887), who shows that since, owing to imperfect diffusion, the counter electro-motive forces at the cathode depend on the current density, and since the variations of E. M. F., due to differences of concentration, are greater for copper than for zinc, we can adjust the current density so as to obtain copper and zinc deposited in nearly equal quantities.

The law given by Berzelius to the effect that the most electro-negative metal is deposited first in electrolysis, is said by Ponthière (Traité d'Electro Métallurgie, Second Edition, 1891, 165) to be reversed when we use an anode composed of an alloy. For the present we shall only record the results of our experiments without discussing them. We hope at some future time to pursue the matter further.

We used in all cases a laminar cathode of German silver or Britannia metal, having a surface of about 4 square inches, on each face. The cathode was greased, so that the deposit could be stripped off and analyzed.

1. Deposition from Silver-Zinc Solutions.—A solution of the cyanides of the metals in excess of potassium cyanide, together with excess of ammonia, was used. 17·15 grammes of silver per liter (about 2½ ounces of silver to the gallon) were dissolved, together with zinc in the proportion present in alloy 1 (a). This alloy was used as anode. The specific gravity of the solution was 1·038. On heating to 40° C., a current of one ampere produced a good deposit, which was found to contain 99·8 of silver. Under these conditions practically no zinc is deposited.

2. Deposition of Silver, Copper and Zinc.—A cyanide solution was made containing the above metals, in the proportions present in alloy 6 (b). The amount of silver per liter was the same as in solution described above. Alloy 6 (c) was used as anode. With a current from four Bunsen cells the deposit was fairly even, but on analysis, was found to contain only about 1 per cent. of copper and zinc together.

The above solution was now mixed with an equal volume of brassing solution from which a good deposit of brass could be obtained with the current from two Bunsen cells. On analyzing the deposit from the mixed solutions heated to 40° C., only a small amount of copper was found. With four Bunsen cells a black deposit (probably oxide) was given by this solution.

On increasing the amount of brassing solution the amount of copper in the deposit increased, until, when the amount of silver originally present in the solution was zero, a brass was obtained containing a little silver.

We have not worked out the exact conditions for obtaining an alloy containing an equal proportion of the three metals, silver, copper, and zinc; but it is evident that the amount of silver present in the solution and in the anode must be much in defect of the proportion required for the alloy.

3. Deposition from Solution Containing Aluminum.—In 1855 Thomas and Tilley took out patents (Nos. 2,724 and 2,756) for depositing alloys of aluminum and silver, aluminum, silver and copper, etc. A solution of aluminum hydrate in potassium cyanide, or in a mixture of sodium carbonate and potassium cyanide, was used in their experiments.

We found that aluminum hydrate does not readily dissolve in potassium cyanide alone, for which we therefore substituted a mixture of caustic potash and potassium cyanide.

A cyanide solution was prepared containing aluminum and silver in the proportions present in the alloy (17·15 grammes of silver being dissolved per liter). On analyzing the deposit given by this solution with a current of about 6 amperes, it was found to contain not more than 0·8 per cent. of aluminum.

A solution of aluminum was prepared containing 70 grammes of aluminum nitrate to the liter, the alumina then precipitated and redissolved in excess of potash and potassium cyanide. Using the silver alloy with 10 per cent. of aluminum as anode and a current of 8 or 9 amperes, at a temperature of about 50° C., a deposit was obtained which still consisted almost entirely of silver, only a faint precipitate being given by ammonia, after precipitating the silver as chloride and filtering.

Our results therefore tend to confirm those of C. Winkler (Chemical News, vol. xxvi., p. 157; Jour. Chem. Soc., New Series, vol. x., p. 1134), who states that plating with aluminum cannot be effected by electro-deposition.

DISCUSSION.

The chairman said that the paper now carried him back nearly thirty years, to the first research work he did under the late Professor Graham at the Mint on a series of nickel and silver alloys, in which considerable difficulty was experienced owing to their segregation and lack of uniformity. On rolling out the buttons obtained, the lack of homogeneity was at once apparent. He would like to ask the exact conditions under which these fused alloys were prepared. Were they quickly cooled? In his own case he believed most were cooled slowly.

Mr. R. Pettigrew stated that silver alloys could be electro-deposited on a commercial scale, and he had two years ago, at a meeting of the Institute of Electrical Engineers, in London, shown, along with samples of every metal which could be electro-deposited, specimens of plates plated with an alloy of silver and cadmium, the percentage composition varying on the one side from 90 per cent. silver and 10 per cent. cadmium to 90 per cent. cadmium and 10 per cent. silver. The difficulty was not in getting these metals to deposit together as an alloy, but to regulate the current density and other features when an alloy process is worked on a commercial scale and where articles of varying size are plated, so as to get an even composition on all parts of the plated goods. The deposit on the inside of a large vessel, for instance, had often a different percentage composition from that on the outside, and hence a different color readily detected by the experienced eye. This difficulty could, however, be got over by using varying sized baths, according to the class of articles to be plated, and keeping the articles moving. The percentage composition of electro-deposited alloys depended on many features, among others the current density, chemical composition of bath, relative amounts of metals in the bath to each other, free cyanide and impurities, as well as to the position of the metals to each other in the electro-negative series; and he had found that silver and cadmium fulfilled the conditions more closely than any of the metals mentioned by the authors. He had tried electro-depositing zinc and silver together, but with a far less quantity of silver present than mentioned in the paper, and found that even with as low as an eighth of an ounce of silver to the gallon and a pound of zinc, he only got down from 5 to 7 per cent. of zinc; and even then it was not possible on a large scale, owing to the large current density required, making the surface rough. Again zinc was so difficultly soluble in potassium cyanide that the zinc cyanide formed on the alloy anode could hardly be got to dissolve, even when an excessive amount of free cyanide was present. He had never tried tin and silver or aluminum and silver in aqueous solutions, because tin was such a difficult metal to manage by itself in electro-deposition that it was hopeless to get it satisfactorily as an alloy. Aluminum he never considered suitable, because it had yet to be got by itself from an aqueous solution, at least with current density suitable for silver plating, and in the analysis given in the paper he rather thought the aluminum got had not existed as metal, but oxide. He had, however, succeeded in depositing these metals satisfactorily from fused salts, but of course this was out of the question for electro plating. With regard to fused alloys with silver, he could corroborate most of what was said in the paper, and gave an instance of an alloy of silver 92·5 and aluminum 7·5, which was so brittle that when he tried to scratch figures on it, it came away in fine powder—in fact, an ingot ¼ inch thick could be broken between the fingers. He also had noticed that alloys often had fine colors, and mentioned one of silver 60 per cent. and cadmium 40 per cent. which was hard and brittle, but the fracture of which had a lovely pink color. Mention had been made in the paper of the tarnishing of silver as compared with electro-deposited alloys, but his experience was that electro-deposited alloys tarnished less rapid yl than pure silver, and then the tarnish which did form was more easily removed and was of a brown color—not the well known purple tarnish of pure silver. Fused alloys acted somewhat differently, and the difference of action had something to do with the chemical compounds formed, for a true alloy did not act as a mere mixture; and he had found that a standard alloy of copper and silver tarnished in spots and streaks, which tended somewhat to show that this alloy was not a definite compound but a mechanical mixture. Zinc and silver alloys he found tarnished usually of a grayish color. The properties of electro-deposited and fused alloys had little relation to each other, as he considered that an electro-deposited alloy was not a definite compound, but merely, as it were, a mechanical mixture. The author gave their method of testing the luster, but he considered it much better to work with a number of plates set in an oblong box, so that the number of reflections from a given point could be ascertained.—Journal of the Society of Chemical Industry.

SORGHUM FOR FORAGE.

YOU take great interest in the introduction of alfalfa clover for hay and fodder, which is right in my estimation. But you lose sight of the most valuable hay, or rather fodder, plant for the average farmer to raise as a sure crop for feed in winter, and that is the old, time-tried sorghum cane plant. No farmer can afford to raise anything else for a feed crop. Millet or Hungarian is nowhere to cane, neither in value as feed nor in quantity of tons per acre, nor to stand drought or chinch bugs. There are many of our upland farmers who, if they had sown four or five acres of cane for feed last year could have done well. The cane would have made all the feed they wanted for their stock and they could have sold their wild or prairie hay that they now have to feed, and could have made a good profit in doing so. But they depend on corn fodder to too great an extent, and at times like the past season has been it makes it too expensive, when sorghum can be raised so cheaply and without any care, simply by plowing the ground well in May or June and sowing the seed and harrowing in, or better, drill same as wheat, and you are done till time to mow the hay. Do not cut too soon. Let it head out but not get too ripe. It is the best when in blossom. Cut and let dry and rake in windrows and take the hay gatherer and put it in large shocks and let it stand until wanted. Put one ton or more in shock. It will keep all winter in fine condition, and the stock will eat it and get fat on it if given all they want. But if fed as I have seen stock fed, by putting a few straws to them once a day, and then have a protection of the north side of a three-strand barb-wire fence, they will not do for export beef next spring. A man might as well think of keeping warm with the thermometer ten degrees below zero by lighting a match once or twice a day. This would be as much sense as some men use in feeding stock. The farmer who will feed and care for stock well is the farmer who will succeed in the end.

Sorghum cane is the best feed for a substitute for hay that I know of to-day. I have tried Kaffir corn and millo maize, and they don't take the place of sorghum. They are non-saccharine, and sweet is what produces fat. Sour is anti-fat. There is no kind of stock that will not eat cane if it is put in the right shape. Some cut it too soon. If you cut it before it heads, it is watery and rank and stock don't like it. It is the same as green corn before it gets in tassel. I would advise farmers to sow largely of cane and secure the seed early this year, as seed is scarce, as the seed crop is light and there is a combine or trust trying to corner all of the cane seed in this State. The seed crop of last year was short 40,000 bushels and seed will be high. There will be a rush in the spring to get seed. The man that gets his seed early is the lucky man this year.—Kansas Farmer.

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