Poultry Diseases and Enemies

(From the Biggle Poultry Book)

Many of the ills that poultry flesh is heir to are directly traceable to bad breeding and treatment. In-and-in-breeding is practiced and the law of the survival of the fittest is disregarded until the stock becomes weak and a prey to disease.

Yards and runs occupied for any considerable time become covered with excreta and a breeding ground for all manner of disease germs.

Dampness from leaky roofs or from wet earth floors, and draughts from side cracks, or from overhead ventilation slay their thousands yearly.

A one-sided diet of grain, especially corn, moldy grain or meal, decayed meat or vegetables, filthy water, or the lack of gritty material are fruitful sources of sickness.

In the treatment of sick birds much depends on the nursing and care. It is useless to give medicine unless some honest attempt be made to remove the causes that produce the disturbance. Unless removed the cause will continue to operate and the treatment must be repeated.

It is an excellent plan to have a coop in some secluded place to be used exclusively as a hospital. If cases cannot be promptly treated it is better to use the hatchet at once and bury deeply, or burn the carcasses. This is the proper plan in every case where birds become very ill before they are discovered.

Sick birds should in no case be allowed to run with the flock and to eat and drink with them.

In giving the following remedies we make no pretence to a scientific handling of the subject.

FEVERS, from colds, fighting of cocks, etc. Symptoms: unusual heat of body, red face, watery eyes and watery discharge from nostrils.

Give dessertspoonful citrate of magnesia and, as a drink, ten drops of nitre in half a pint of water.

APOPLEXY AND VERTIGO, from overfeeding or fright. Symptoms: unsteady motion of the head, running around, loss of control of limbs. Give a purgative and bleed from the large veins under wing.

PARALYSIS, from highly seasoned food and over stimulating diet. Symptoms: inability to use the limbs, birds lie helpless on their side. Treatment—The same as for apoplexy.

LEG WEAKNESS occurs in fast-growing young birds, mostly among cockerels. A fowl having this weakness will show it by squatting on the ground frequently and by a tottering walk. When not hereditary it usually arises from a diet that contains too much fat and too little flesh and bone-making material, such as bread, rice, corn and potatoes. To this should be added cut green bone, oats, shorts, bran and clover, green or dry. Give a tonic pill three times a day made of sulphate of iron, 1 grain; strychnine, 1 grain; phosphate of lime, 16 grains; sulphate of quinine, ½ grain. Make into thirty pills.

CANKER OF THE MOUTH AND HEAD.—The sores characteristic of this disease are covered with a yellow cheesy matter which, when it is removed, reveals the raw flesh. Canker will rapidly spread through a flock, as the exudation from the sores is a virulent poison, and well birds are contaminated through the soft feed and drinking water. Sick birds should be separated from the flock and all water and feed vessels disinfected by scalding or coating with lime wash. Apply to sores with a small pippet syringe or dropper the peroxide of hydrogen. When the entire surface is more or less affected, use a sprayer. Where there is much of the cheesy matter formed, first remove it with a large quill before using the peroxide. A simple remedy is an application to the raw flesh of powdered alum, scorched until slightly brown.

SCALY LEG, caused by a microscopic insect burrowing beneath the natural scales of the shank. At first the shanks appear dry, and a fine scale like dandruff forms Soon the natural scale disappears and gives place to a hard, white scurf. The disease passes from one fowl to another through the medium of nests and perches, and the mother-hen infecting her brood. To prevent its spread, coat perches with kerosene and burn old nesting material and never use sitting hens affected by the disease. To cure, mix ½ ounce flowers of sulphur, ¼ ounce carbolic acid crystals and stir these into 1 pound of melted lard. Apply with an old tooth brush, rubbing in well. Make applications at intervals of a week.

WORMS in the intestines of fowls indicate disturbed digestion. Loss of appetite and lack of thrift are signs of their presence. Give santonin in 2-grain doses

six hours apart. A few hours after the second dose give a dessertspoonful of castor oil. Or, put 15 drops of spirits of turpentine in a pint of water and moisten the feed with it.

BUMBLE-FOOT, caused by a bruise in flying down from perches or in some similar manner. A small corn appears on the bottom of the foot, which swells and ulcerates and fills with hard, cheesy pus. With a sharp knife make a cross cut and carefully remove all the pus. Wash the cavity with warm water, dip the foot in a solution of one-fourth ounce sulphate of copper to a quart of water and bind up with a rag and place the bird on a bed of dry straw. Before putting on the bandage anoint the wound with the ointment recommended for scaly leg or coat it with iodine.

GAPES, caused by the gape-worm, a parasite that attaches itself to the windpipe, filling it up and causing the bird to gasp for breath. The worm is about three-fourths of an inch long, smooth and red in color. It appears to be forked at one end, but in reality each parasite is two worms, a male and female, firmly joined together. This parasite breeds in the common earth worm. Chicks over three months old are seldom affected. If kept off of the ground for two months after hatching, or on perfectly dry soil, or on land where affected chicks have never run, chicks will seldom suffer from the gapes. Old runs and infested soil should have frequent dressings of lime.

In severe cases the worms should be removed. To do this put a few drops of kerosene in a teaspoonful of sweet oil. Strip a soft wing feather of its web to within an inch of the tip, dip in the oil, insert feather in windpipe, twirl and withdraw. Very likely some of the parasites and mucus will come with it. The rest will be loosened or killed, and eventually thrown out. It may be necessary to repeat the operation.

To kill the worm in its lodgment, gum camphor in the drinking water or pellets of it as large as a pea forced down the throat is recommended. Turpentine in the soft feed, as advised in the treatment for worms in the intestines, is said to be effective. Pinching the windpipe with the thumb and finger will sometimes loosen the parasite.

When broods are quartered on soil known to be infested, air-slacked lime should be dusted on the floor of the coop, and every other night, for two or three weeks, a little of the same should be dusted in the coop over the hen and her brood. To apply, use a dusting bellows and only a little each time.

CHOLERA is due to a specific germ, or virus, and must not be confounded with common diarrhœa. In genuine cholera digestion is arrested, the crop remains full, there is fever and great thirst. The bird drinks, but refuses food and appears to be in distress. There is a thickening of the blood, which is made evident in the purple color of the comb. The discharges from the kidneys, called the urates, which in health are white, become yellowish, deep yellow, or, in the final stages, a greenish-yellow. The diarrhœa grows more severe as the disease progresses. A fowl generally succumbs in two days. The virus of cholera is not diffusible in the air, but remains in the soil, which becomes infected from the discharges, and in the body and blood of the victims. It may be carried from place to place on the feet of other fowls or animals. Soil may be disinfected by saturating it with a weak solution of sulphuric acid in water. Remove at once all well birds to new and clean quarters and wring the necks of all sick birds and burn their carcasses and disinfect their quarters.

For cases not too far gone to cure give sugar of lead, pulverized opium, gum camphor, of each, 60 grains, powdered capsicum (or fluid extract of capsicum is better, 10 drops), grains, 10. Dissolve the camphor in just enough alcohol that will do so without making it a fluid, then rub up the other ingredients in the same bolus, mix with soft corn meal dough, enough to make it into a mass, then roll it and divide the whole into one hundred and twenty pills. Dose, one to three pills a day for grown chicks or turkey, less to the smaller fry. The birds that are well enough to eat should have sufficient powdered charcoal in their soft feed every other day to color it slightly, and for every twenty fowls five drops of carbolic acid in the hot water with which the feed in moistened.

ROUP.—The first symptoms are those of a cold in the head. Later on the watery discharge from the nostrils and eyes thickens and fills the nasal cavities and throat, the head swells and the eyes close up and bulge out. The odor from affected fowls is very offensive. It is contagious by diffusion in the air and by contact with the exudations from sick fowls. To disinfect houses and coops burn sulphur and carbolic acid in

them after turning the fowls out and keep closed for an hour or two. Pour a gill of turpentine and a gill of carbolic acid over a peck of lime and let it become slaked, then scatter freely over the interior of houses and coops and about the yards.

For the first stages spray the affected flock while on the roost or in the coop with a mixture of two tablespoonfuls of carbolic acid and a piece of fine salt as big as a walnut in a pint of water. Repeat two or three times a week. Or, if a dry powder is preferred, mix equal parts of sulphur, alum and magnesia and dust this in their nostrils, eyes and throat with a small powder gun. The nasal cavities should be kept open by injecting with a glass syringe or sewing machine oil-can a drop or two of crude petroleum. A little should be introduced also through the slit in the roof of the mouth. Give sick birds a dessertspoonful of castor oil two nights in succession, and feed soft food of bran and corn meal seasoned with red pepper and powdered charcoal. A physician advises the following treatment: hydrastin, 10 grains; sulph. quinine, 10 grains; capsicum, 20 grains. Mixed in a mass with balsam copaiba and made into twenty pills; give one pill morning and night; keep the bird warm and inject a saturated solution of chlorate potash in nostrils and about 20 drops down the throat.

PIP, so-called, is not a disease but only a symptom. The drying and hardening of the end of the tongue in what is called "pip" is due to breathing through the mouth, which the bird is compelled to do because of the stoppage of the nostrils. By freeing the natural air passages the tongue will resume its normal condition.

DIPHTHERIA is a contagious disease. The first symptoms are those of a common cold and catarrh. The head becomes red and there are signs of fever, then the throat fills up with thick, white mucus and white ulcers appear. The bird looks anxious and stretches its neck and gasps. When it attacks young chicks it is frequently mistaken for gapes. When diphtheria prevails, impregnate the drinking water with camphor, a teaspoonful of the spirits to a gallon of water, and fumigate the house as recommended for roup.

Spray the throat with peroxide of hydrogen or with this formula: 1 ounce glycerine, 5 drops nitric acid, 1 gill water. To treat several birds at once with medicated vapor, take a long box with the lid off, make a partition across and near to one end and cover the bottom with coal ashes. Mix a tablespoonful each of pine tar, turpentine and sulphur, to which add a few drops, or a few crystals, of carbolic acid and a pinch of gum camphor. Heat a brick very hot, put the fowls in the large part and the brick in the other, drop a spoonful of the mixture on the brick and cover lightly to keep the fumes in among the patients. Watch carefully, as one or two minutes may be all they can endure. Repeat in six hours if required.

CROP-BOUND.—The crop becomes much distended and hard from obstruction of the passage from the crop to the gizzard by something swallowed; generally, it is long, dried grass, a bit of rag or rope. Relief may sometimes be afforded by giving a tablespoonful of sweet oil and then gently kneading the crop with the hand. Give no food, except a little milk, until the crop is emptied. Wet a tablespoonful or more of pulverized charcoal with the milk and force it down the throat. Should the crop not empty itself naturally pluck a few feathers from the upper right side of it and with a sharp knife make a cut about an inch long in the outer skin. Draw this skin a little to one side and cut open the crop. Remove its contents, being careful not to miss the obstruction. Have a needle threaded with white silk ready, and take a stitch or two in the crop skin first, then sew up the outer skin separately. Put the patient in a comfortable coop, and feed sparingly for a week on bran and meal in a moist state, and give but little water.

SOFT OR SWELLED-CROP arises from lack of grit, or from eating soggy and unwholesome food. The distended crop contains water and gas, the bird is feverish and drinks a great deal. By holding it up with its head down the crop will usually empty itself. When this is done give teaspoon doses of charcoal slightly moistened twice at intervals of six hours. Restrict the supply of water and feed chopped onions and soft feed in moderation.

EGG-BOUND, DISEASES OF THE OVIDUCT. Overfat hens are often troubled in this way. Forcing hens for egg production will sometimes break down the laying machinery. Give green food, oats, little corn, and no stimulating condiments. Let the diet be plain and cooling in its

nature. To relieve hens of eggs broken in the oviduct, anoint the forefinger with sweet oil and deftly insert and draw out the broken parts. When the hen is very fat and the egg is so large it cannot be expelled, the only way to save the hen is to break the egg and remove it as above directed.

WHITE-COMB OR SCURVY, caused by crowded and filthy quarters and lack of green food. The comb is covered with a white scurf. This condition sometimes extends over the head and down the neck, causing the feathers to fall off.

Change the quarters and diet, give a dose of castor oil and follow this with a half a teaspoonful of sulphur in the soft food daily.

RHEUMATISM AND CRAMP caused by cold and dampness. Chicks reared on bottom-heat brooders are particularly subject to these troubles. Damp earth floors and cement floors in poultry houses produce it in older birds.

Give dry and comfortable quarters, feed little meat, plenty of green food, and soft feed seasoned with red pepper.

DIARRHŒA of chicks with clogging of the vent. Remove the hardened excretion and anoint the parts. Chamomilla is useful in this complaint, a few drops in drinking water.

FROSTED COMB AND WATTLES.—As soon as discovered bathe with compound tincture of benzoin.

FOR LICE on perches, walls and coops, use kerosene or lime wash. To make the lime-wash more effective, pour a little crude carbolic acid on the lime before slaking or mix with plenty of salt.

For use in nests, pour crude carbolic acid on lime and allow it to air-slake. Put one or two handfuls of the carbolized lime dust in the nest box.

Pyrethrum powder kills by contact and is effective for dusting in nests, and through the feathers of birds. Its judicious use in the plumage and nests of sitting hens will insure immunity from lice for the hen and her young brood.

Chicks and poults are often killed by large lice that congregate about the head, throat, vent and wings. To destroy them, soak fish berries in alcohol, take the birds from under the mothers at night and slightly moisten the down of the infested parts with the poison.

How to Preserve Eggs

Now that eggs are dearer as a rule than they have been for years, many people are inquiring about the methods of preserving them. The old way was to pack them in salt or lime. This served the purpose, but it gave the eggs a very strong taste.

The approved method now is the one which calls for the use of "water glass," or silicate of soda. This is a thick, syrupy liquid which can be had at most drug stores for about 10 cents a pound, and a pound is enough to treat five dozen eggs, so that the cost of preserving is about two cents a dozen.

There are several grades of water glass, and it is wise to get the best. To prepare the solution, stir one part of the silicate of soda into sixteen parts of water which has been boiled, cooled and carefully measured.

It is essential to have the eggs fresh, or the experiment will not be a great success. Those over three days old should not be used, as the air has already had a chance to penetrate them. The very best way is to keep the solution made up ready and put the eggs into it just as soon as they are brought in from the nests, if you have your own chickens.

It is worse than useless to try to preserve eggs that are not fresh or that have been cracked or washed.

Incubation and Gestation Tables

Chickens	20-22 days
Geese	28-34 days
Ducks	28 days
Turkeys	27-29 days
Guinea fowls	28 days
Pheasants	25 days
Ostriches	40-42 days

The period of gestation in animals varies considerably, but the following is an average period based on a long series of observations:

Elephant	2 years
Camel	11-12 months
Ass	12 months
Mare	11 months
Cow	9 months
Sheep	5 months
Goat	5 months
Pig	3½ months
Bitch	9 weeks
Cat	8 weeks
Rabbit	30 days
Guinea pig	65 days

Hog Ailments and How to Treat Them

(From the Biggle Swine Book)

More has been spoken and written on the subject of hog cholera than upon any other one subject connected with hogs. It has ever been a fruitful source for discussion at farmers' institutes and an endless theme on which to write. The Government has appropriated large sums of money and has employed learned men who have labored with seeming diligence for years, and yet after all these years of waiting and all this expenditure of money we are forced to admit, whether humiliating or not, that we know but very little that is of practical benefit about the whole matter.

But two things are absolutely known about the disease. One is that it sweeps unrestrained over vast areas of country, leaving death and destruction in its wake; and the other is that hogs which contract the disease usually die.

We shall not attempt to deal with this subject in a scientific way, but shall deal with it rather from a practical standpoint.

A somewhat recent means of preventing the disease is the serum or antitoxin cure. It consists in introducing into the system of the animal a serum which enables the body to more successfully combat the disease. The Government officials seem to be highly pleased with the results so far and seem to believe that relief from the dread disease is likely to come through this means. The serum produced last year, wherever used in cholera-infected herds, saved over eighty per cent. of the animals. It is easily applied, and its good effects in sick hogs are seen almost immediately.

Page after page has been written as a means of telling hog cholera, but much of it is difficult of comprehension to the average reader. If you have never had it in your herd you are to be congratulated on your good fortune; and if you ever do, when you are done with it you may not have as many hogs as you did before, but rest assured of one thing, and that is you will know hog cholera when you see it again. As a rule hogs do not look well for weeks before an attack. At other times it will come like a bolt of lightning from a clear blue sky. The first thing noticeable is a loss of appetite; the hair will look harsh and dry; sometimes a slight cough will be noticeable, at other times not. The disease is sometimes of slow development, at other times quite rapid. Instead of the sprightly, rapid movement so characteristic of the young and growing hog, he moves slowly and indifferently; he looks gaunt and tired; his back is arched, and he moves his hind legs with a dragging motion; his temperature will most likely be high, probably from 104 to 108—the normal temperature of the hog is from 100 to 102. His bowels may be costive or the discharges may be thin and watery in substance, but usually black or dark in color, emitting an offensive odor peculiar to the disease.

The disease may be of a lingering character and the animals linger for weeks, or they may die in three of four days. Usually the lingering type is less fatal than the more rapid forms of the disease. Hogs which discharge freely in the first stages of the disease are more likely to recover than when the bowels remain constipated. Dark blue spots will often appear under the skin. The bowels will be more or less inflamed inside; in the small intestines and sometimes in the stomach will be found ulcers; this, however, is not common in the first stages of the disease. The bladder will most likely be full of a dark thick substance, showing that the kidneys, and in fact the whole internal organism, are affected.

If we were to say what we thought was the best thing that could possibly be done when cholera appears in a herd, we would unhesitatingly say, take the well hogs to clean new quarters where no hogs have been for years. Then if more of them take sick move them again, and it is our belief based on actual experience that more can be accomplished in this way than by the use of all the medicine in the country. For various reasons it is not always possible to move hogs, and in that case treatment may be resorted to, sometimes with fairly good results. The treatment should consist in separating the well from the sick hogs, and in dividing the sick hogs according to age and size and severity of the attack. Not more than four or five hogs should be in the same pen, and fewer would be still better. Feed but little, and let that be food which is easily digested. Use air-slacked lime and crude carbolic acid freely as a disinfectant. Use it both on the hogs and on the ground, in

the sleeping places, on the fences and in the drinking vessels. As much depends on a thorough use of disinfectants as upon any other thing. If the bowels are constipated give something to move them. If too loose give something to check them. In short, use good common horse sense (so to speak) and you will usually succeed very well. There is nothing better than salts or oil to move the bowels, and nothing shows better results in checking them than a few drops of crystal carbolic acid. We know of no food better, if indeed as good, for sick hogs than ship stuff, or middlings as it is sometimes called; it seems to digest easily and is soothing to the bowels.

If the weather is wet and cold keep the hogs dry and warm. In wet weather (if not too warm) keep the hogs in a floored pen, or at least in a pen where no water will lie in sinks or holes, as dirty water is one of the worst things a sick hog can possibly have. If the weather is warm, shelter the hog from heat. In other words, make him as comfortable as possible.

Let it be borne constantly in mind that much depends on good nursing. It would seem natural and reasonable that an animal afflicted as he is would do best if allowed plenty of fresh water to drink, but actual experience demonstrates that a greater number recover when the supply of water is limited than when it is not.

Hogs that are very sick should be kept by themselves, as others seem to disturb them, and often their recovery depends on being perfectly still at the critical period of the disease. As a rule hogs that are too sick to eat die. All hogs that die of cholera, or of any other disease for the matter of that, should be burned and not buried, as abundant evidence can be produced to prove that the carcasses of hogs dying of cholera have been the cause of an outbreak years afterward. By all means burn all dead hogs as the only absolutely safe way of disposing of them. The burning operation is very simple. Lay the bodies across two logs, sticks or pieces of iron that will keep them up off the ground so that the fire can get under them, and the grease from their own bodies will usually do the work, with a little wood or corn cobs added occasionally.

Experience teaches that the disease more commonly appears in large herds than in small ones. The moral of this, then, is easily understood. Do not keep hogs in large droves. Not over twenty-five or thirty hogs at most should long remain together, and half the number would be infinitely better and safer in every way. Hogs of different sizes and ages should not be kept together, excepting of course sows and suckling pigs. Hogs should not be kept on the same ground from year to year if it can possibly be avoided. Plow up the lots and pens and cultivate them for a year or two; it will greatly assist in keeping your lots free from the germ. The disease is much more prevalent in the summer and fall months than in other seasons of the year. Then as far as is possible reduce the number of hogs on the farm at this season of the year.

If your neighbor's hogs have the disease, stay away from his pens and be sure he stays away from yours. Shoot a crow, a buzzard, or a stray dog that comes on your place as unhesitatingly as you would kill a mad dog. This trio does more to scatter the disease than all the other causes combined. If your hogs are fit or any way near fit to go to market when the disease makes its appearance in the neighborhood, sell them without delay. "A bird in hand is worth two in a bush." If your hogs have cholera this year, don't get discouraged and quit, but try it again, on fresh ground.

If your brood sows have passed through the cholera, keep them; they are valuable. They will never again have the disease, and their pigs are not nearly so apt to contract it as pigs from sows that have not had the disease. Look out for streams which come down from some neighbor above you. This has been found a frequent cause of cholera outbreaks. The germs of hog cholera possess great vitality, and will live in the soil, in moist matter and especially in water, for months.

If you feed corn, rake the cobs together often and burn them; pour water on the coals and then put salt on the charcoal thus made and you have an excellent preventive for diseases, with little or no cost. Keep your hogs, excepting brood sows, ready for market. It may come handy some day. Strong, vigorous hogs are less liable to contract the disease than hogs of less strength and vigor. Then breed and feed for both these things. Eternal vigilance in hog breeding, as in other kinds of business, is the price of success.

Here is a formula for the treatment of hog cholera that is probably as good as

any, which is not saying much. It is suggested by the Department of Agriculture:

Sulphur	1 pound.
Wood charcoal	1 pound.
Sodium chloride	2 pounds.
Sodium bicarbonate	2 pounds.
Sodium hyposulphite	2 pounds.
Sodium sulphate	1 pound.
Antimony sulphide	1 pound.

Thoroughly mix and give a large tablespoonful to each 200-pound hog, once a day. If the animal does not eat, add the medicine to a little water, thoroughly shake and give from a bottle by the mouth. If the animal will eat, mix the medicine with sloppy food. The same remedy is recommended as a preventive to those animals that do not as yet show signs of disease.

If you have had cholera on your place, and you have small, inexpensive pens, burn them at once. In a piggery, burn all the litter and loose inexpensive parts; renew the floor, if possible, and disinfect the remainder by washing it with hot water and washing soda. After washing, apply with a whitewash brush, or better yet a spray pump, a solution of one part of carbolic acid to fifty parts of water. Then thoroughly whitewash. Treat the fences in the same way. Earth floors should be removed to a depth of at least six inches and the ground sprinkled with chloride of lime and a few days later a good coating of air-slacked lime. Don't put pigs in the quarters for at least six months, and, if possible, have them vacant over the first winter.

An Ohio breeder of large experience, in the Miami valley, where hog cholera first appeared in 1856 and has recurred at frequent intervals, holds that drugs, virus and antitoxin have all been fairly tried sundry times by him and his neighbors. He believes that prevention will do more to hold in check the plague than drugs and hypodermic infusions. The most important help to prevent spread of disease is not to allow the hog farm to become infected with the excrement of diseased hogs. This can be done by quarantining the herd in a field, that is to be put under cultivation the following year. This quarantine must be established as soon as the first pig is taken sick. If the disease is in the neighborhood, carefully watch for first symptoms of disorder. Do not wait until several are sick and scouring, for this excrement is loaded with germs of disease, and these germs may retain vitality many months when covered in the corners of pens, or filth of yards, or about an old straw stack; but when exposed to sunlight or dryness they lose vitality in a few days, and under some very drying sunlight conditions in a few hours. Carefully observing these facts, he has in forty years been clear of hog cholera the year following an attack, and on until the disease has become epidemic in his neighborhood. After the herd has been placed in quarantine away from the permanent hog houses, lots and feeding floors, he kills and burns, or buries five feet deep, each animal as soon as it shows distinct symptoms of disease. They are burned or buried beside the quarantine, and in the field to be cultivated the following year. It requires nerve to kill breeding stock of great value, but they are as liable to spread and entail disease as any other, when once attacked.

If, by any means, we can prevent spread of germs, by so much do we hold the disease in check. A farm, with its feed lots and pens and shelters infected by the excrement of the diseased, becomes as deadly a centre as the public stock-yards and filthy stock cars on the railroads, and these are so thoroughly infected that we can never safely take stock hogs from these to our farms. This is not theory, but well proven fact.

Pig ailments are numerous; we shall speak only of some of the most common.

It is always best to give medicines mixed with food or drink where possible. If the animal refuses food or drink and it is necessary to administer drugs, it may be done by placing a stout chain (an ordinary harness breast chain does very well) within the mouth and well back between the jaws, which are thus kept from crushing the bottle. Two or three men are necessary for the undertaking, one or two to hold the chain and one to pour the medicine. The head should be well elevated, which places the pig on his haunches. Do not pour the medicine fast enough to strangle the animal.

Hogs will not do well when the skin is covered with filth. Bad air will bring on coughs; all corn for food, fever; a wet bed, rheumatism; and a big bunch together will breed disease. With a clean skin, good air, a variety of food, a dry bed and a few together, and lots of out-of-doors, they will do well.

When at pasture they find many roots, nuts and pebbles, besides being continually active, which does more than food

for their hearty health, rapid and easy digestion and speedy, profitable growth.

THUMPS.—This disease is quite common (especially in the early spring) and is exceedingly hard to handle when once contracted. More can be done to prevent than to cure. You visit the sow and litter in the morning to give them their accustomed feed, and you notice that one of the fattest and plumpest ones does not leave his bed as do the others. You enter the sleeping room and compell him to come out, which he does somewhat reluctantly, and you will notice that his sides move with a peculiar jerking motion, and if allowed he will soon return to his bed. Rest assured he has thumps, and nine chances to one he will die. It is caused by fatty accumulations about the breast, which interfere with its action, and the lungs work hard—pump for dear life to keep up the heart's action—to send the blood through the body. The pig is faint because of feeble circulation, and he is cold, and soon dies from exhaustion or weakness. He has no strength to suck or move.

To prevent thumps, get over into the pen several times a day and hustle the little pigs about the pen; also stint the sow so that she will give less milk. Pigs when they stir about, and when they are thin in flesh, rarely have thumps.

Thumps rarely occurs among pigs farrowed after the weather is fine, but does quite frequently occur among pigs farrowed in early spring. If the weather is cold and stormy and the sow and litter keep their bed much, then be on the lookout for thumps. Guard against it by compelling both sow and litter to exercise in the open air.

CANKEROUS SORE MOUTH is a disease which is quite common and which if not promptly taken in hand is often quite fatal. When pigs are from a few days to two weeks old, you may notice a slight swelling of the lips or a sniffling in the nose. An examination will show a whitish spongy growth on the sides of the mouth just inside the lips or around the teeth. This is cankerous sore mouth, and if not taken promptly in hand will result in the death of the entire litter, and will sometimes spread to other litters.

Some claim the disease is caused by damp and filthy beds, others say it comes from a diseased condition of the sow, and still others claim it is caused by the little pigs fighting over the teats and wounding each other with their sharp teeth, and stoutly aver that if the teeth are promptly removed no case of sore mouth will ever occur.

Hold the pig firmly and with a knife or some cutting instrument remove all the spongy foreign growth, and be sure you get it all even though the pig may squeal and the wound bleed; your success in treating the disease will depend largely on the thoroughness with which you remove this foreign growth. After removing the fungous growth apply an ointment made of glycerine and carbolic acid in about the proportion of one part of the acid to from five to eight parts glycerine. Repeat this each day for three or four days and the disease will usually yield. You may discover in a day or two after commencing treatment that you did not succeed in removing all the cankerous growth at first, and if so, repeat the cutting operation till you do remove it all.

Another treatment which we have heard recommended is to catch the diseased pig and dip his nose and mouth up to his eyes in chlora naptholeum without diluting it. This is certainly easily done and is highly commended by the person suggesting it.

BLIND STAGGERS, INDIGESTION, SICK STOMACH, FOUNDER.—Causes, over-feeding, especially common with new corn; sour or decayed food. Sudden warm sultry weather predisposes in highly fed hogs. Insufficient exercise is also a predisposing cause.

Symptoms.—Loss of appetite, bowels constipated, or maybe diarrhœa. In some severe cases blind staggers and great paleness of mouth and nose, coldness of surface of body; abdomen may be distended and drum-like from contained gases.

Treatment.—Remove sick animals, provide clean, dry, well ventilated quarters, with chance for exercise, and fresh earth and water. If animal will eat, give light feed. Give charcoal in lump form, also mix soda bicarbonate in food at rate of two tablespoonfuls per day to each half-grown animal. It is rarely necessary to drench with medicine. If recovery begins, use care not to again feed too much.

MILK FEVER occurs in sows immediately after farrowing or within the first few days afterwards. The symptoms are loss of milk, swollen, hard condition of the milk glands, which are more or less painful on pressure. Sow may not allow the pigs to suck; she may lie flat on her

belly or stand up, and in extreme cases the sow has spells of delirium, in which she may destroy her young.

Cause.—Injudicious feeding, overfeeding on milk-producing foods. Do not feed sow quite full rations for few days just before and after farrowing.

Treatment.—Give sow plenty of cool clean water; bathe the swollen glands for half hour at a time with water as warm as she will bear, dry thoroughly with soft cloth and give good dry pen. If bowels seem constipated give the sow internally one-half pint pure linseed oil. (Never use the boiled linseed oil used by painters; it is poisonous.) If the sow starts killing her young, or has no milk for them, it is best to take most of them, or all, away from her and feed by hand with spoon or ordinary rubber nipple and bottle. For this use one part boiled water and three parts cow's milk. The pigs may be returned to the sow if her milk returns.

Scours among pigs is another common and very troublesome though not dangerous disease. This disease is not confined to any particular season, but is more common in the wet, damp weather of April and early May than in other seasons of the year.

As in thumps, remove the cause. This disease is almost invariably caused by some improper food eaten by the sow. A sour swill barrel is often the cause. It should be borne in mind that pigs once affected will be more liable to a recurrence of the disease than those never affected, and greater care should be used with them for some weeks till they fully recover.

Constipation.—Cause, improper feeding, exclusive grain diet, lack of exercise. Not dangerous in itself, but frequently followed by prolapsus of the rectum, or what is commonly called piles. The constant straining causes this. The only remedy is laxative food and exercise. The protruding bowel must be washed clean as soon as seen and well covered with olive oil or lard. It should then be returned by applying firm pressure with the hand, and when once in place should be retained by three or more stitches of waxed linen or heavy silk thread, passed from side to side through the margins of the opening, care being used to take a deep hold in the skin.

While this operation is being done the animal should be held by the hind legs by two assistants, thus elevating the hind quarters. Allow stitches to remain two or three weeks.

Rheumatism.—A disease of the joints, manifested by pain, heat and lameness, with swelling of one or several joints. There may be high fever and loss of appetite. May be acute and rapid in its course, or slow, chronic and resulting in permanent enlargements of the bones of the legs, especially the knee and hock.

Causes.—Primarily deranged digestion, lack of exercise; dampness and exposure to draughts of cold air also a cause. The tendency to rheumatism is hereditary in certain families of hogs.

Treatment.—Endeavor to prevent by proper exercise, food and attention to surroundings. Do not breed rheumatic specimens even if fully recovered from lameness. In acute cases an adult hog should have twice or three times daily one drachm salicylate soda.

Asthma sometimes occurs in adult hogs.

Symptoms.—Shortness of breath on lease exercise, noisy breathing, more or less intermittent. Do not breed; butcher early.

Congestion of the Lungs sometimes occurs, the result of driving or chasing. May be rapidly fatal.

Symptoms. — Sudden shortness of breath and sudden great weakness. The hog is not adapted to rapid driving; if it must be driven at all, give plenty of time.

Pneumonia (Lung Fever) may follow congestion of the lungs; may be induced by crowding too many hogs together, when they heat and become moist, after which they are in poor condition to withstand cold.

Symptoms.—Loss of appetite, chills, short cough, quick breathing.

Treatment.—Separate sick at once from the drove; give dry quarters with abundance of dry bedding; tempt appetite with small quantities of varied food. Apply to sides of chest, enough to moisten the skin, twice daily, alcohol and turpentine equal parts; continue until skin becomes somewhat tender.

Tetanus (Lock-Jaw).—Caused by introduction into the system of the tetanus bacteria, which gains entrance through a wound.

Symptoms.—A stiffness of more or less the entire muscular system, generally most marked in the jaws, which are greatly stiffened. Eating very slow, or entirely stopped; appetite not lost.

Treatment.—Some cases recover if

carefully nursed. Give nourishing drinks, elevate trough or bucket so the patient can get its snout into the drink; give dissolved in hot water and mixed with the slop forty grains bromide of potash two or three times daily until improvement is noticed. Do not attempt to drench. Any wound which seems to be a cause should be cleansed and wet often with five per cent. solution of carbolic acid and water.

Lice.—Very commonly found upon hogs. They are introduced by new purchases or by visiting animals.

Caution.—Examine the newly purchased hog well on this point before placing with the drove. Hog lice are quite large and easily detected on clean white animals, but not readily on dark or dirty skins.

Remedy.—Wash well with soap and water, if weather is not too cold, then warm water, if weather is not too cold, then apply enough petroleum and lard, equal parts, to give the skin a complete greasing. If weather is too cold for washing, clean with stiff brush. Creolin one part to water five parts is also a safe and sure remedy. Two or more applications are necessary at intervals of four or five days to complete the job. The woodwork of pens and rubbing places must be completely whitewashed.

Mange.—Caused by a microscopic parasite which lives in the skin at the roots of the bristles.

Symptoms.—Intense itching with redness of the skin from the irritation of rubbing. Rather rare, but very contagious.

Treatment. — Separate diseased animals; scrub them thoroughly with warm water and strong soap; apply ointment composed of lard, one pound; carbonate of potash, one ounce; flor. sulphur, two ounces; wash and re-apply every four days.

Maggots.—The larvæ of the ordinary blow-fly frequently infests wounds on hogs during the summer months. Watch all wounds during hot weather; keep them wet frequently with creolin one part and water six parts, or five per cent. watery solution carbolic acid. If the maggots gain entrance to the wound, apply either above remedies freely, or ordinary turpentine with a brush or common oil can.

Round Worms. — Very common in shotes and young hogs, not apparently harmful, unless in great numbers, when they cause loss of flesh. They may be exterminated by keeping the hog without food for twenty-four hours, and giving to each shote or old pig one tablespoonful of turpentine thoroughly beaten up with one egg and one-half pint of milk.

Tuberculosis (Consumption). — A contagious disease common in man, cattle and not rare in the hog.

Symptoms.—Loss of flesh, cough, diarrhœa, swelling about the head and neck, which may open and discharge with little tendency to heal; death in from few weeks to months. Post mortem shows various sized tubercles, which may be situated in any part of the body, most commonly in the bowels, lungs, liver, or glands of the neck.

Causes.—Direct contagion from other hogs, but generally from feeding milk from tuberculous cows, or by eating butcher offal from such cows.

Prevention.—Care as to the source of the milk fed; if suspicious, boiling will render it safe. Do not feed butcher offal; separate suspicious hogs at once, and if satisfied they are tuberculous, kill and bury deep, or burn them. The tuberculin test can be applied to the remainder of drove, as without it it is impossible to say how many may be diseased.

Wounds generally heal readily in the hog if kept clean and free from maggots. The result of neglected castration wounds is sometimes serious. Have the animal clean as possible when castrated, and endeavor to keep it clean and give opportunity for abundant exercise until wound is healed. There is probably nothing better and safer to apply to wounds of the hog than creolin one part, water six parts.

Travel Sickness.—Similar to ordinary sea-sickness in man; very common in shipping pigs by wagon.

Symptoms.—Vomiting, diarrhœa, great depression; seldom if ever fatal. May be rendered must less severe by very light feeding before shipment.

To Find the Amount of Wall Paper Required to Paper a Room

Measure the distance around the room deduct the width of each window and door, take two-thirds of result. Divide this result by the number of strips that can be cut from each roll and you have the number of rolls required. A roll is generally a foot and a half wide, 24 feet long and contains 36 square feet, or 4 square yards.

Concrete

Concrete is made by mixing together Portland cement, sand and stone (or gravel). Various proportions of each are used, depending upon the use to which the concrete is put. About half an hour after mixing these materials together, the mass begins to stiffen, until, in from half a day to a day, it becomes so hard that you cannot dent it with the hand. By a month the mass is hard as stone—indeed, harder than most stones. The best way to buy cement is in cloth sacks. Manufacturers charge more for cement in cloth sacks, but allow a rebate for the return of the empty sacks. A bag of cement weighs 95 pounds, and four such bags make a barrel of 380 pounds.

It is important that your stock of cement be kept in a dry place. Once wet, it becomes hard and lumpy, and in such condition is useless. If, however, the lumps are caused by pressure in the storehouse, the cement may be used with safety. Lumps thus formed can be easily broken by a blow from the back of a shovel.

In storing cement, throw wooden blocks on the floor. Place boards over them and pile the cement on the boards, covering the pile with a canvas or a piece of roofing paper. Never, under any circumstances, keep cement on the bare ground, or pile it directly against the outside walls of the building.

Do not use very fine sand. If there is a large quantity of fine sand handy, obtain a coarse sand and mix the two sands together in equal parts; this mixture is as good as coarse sand alone.

Sometimes fine sand must be used, because no other can be obtained; but in such an event an additional amount of cement must be used—sometimes as much as double the amount ordinarily required. For example, in such a case, instead of using a concrete 1 part cement, 2½ parts sand and 5 parts stone, use a concrete 1 part cement, 1¼ parts sand and 2½ parts stone.

Besides being coarse, the sand should be clean. The presence of dirt in the sand is easily ascertained by rubbing a little in the palm of the hand. If a little is emptied into a pail of water, the presence of dirt will be shown by the discoloration of the water. This can be discovered also by filling a fruit jar to the depth of 4 inches with sand and then adding water until it is within an inch of the top. After the jar has been well shaken, the contents should be allowed to settle for a couple of hours. The sand will sink to the bottom, but the mud, which can be easily recognized by its color, will form a distinct layer on top of the sand, and above both will be a clear depth of water. If the layer of mud is more than one-half inch in thickness, the sand should not be used unless it is first washed.

To wash sand build a loose board platform from 10 to 15 feet long, with one end a foot higher than the other. On the lower end and on the sides nail a board 2 by 6 inches on edge to hold the sand. Spread the sand over this platform in a layer three or four inches thick, and wash it with a hose. The washing should be started at the high end and the water allowed to run through the sand and over the 2-by-6-inch piece at the bottom. A small quantity of clay or loam does not injure the sand, but any amount over 5 per cent. does.

Great care should be used in the selection of the stone or gravel. The pebbles should be closely inspected to see that there is no clay on their surface. A layer of such clay prevents the "binding" of the cement. If necessary, stone or gravel may be washed in the same way as above described for sand. Dust may be left in the crushed stone without fear of its interfering with the strength of the cement, but care should be taken to see that such dust is distributed evenly through the whole mass, and when dust is found in stone, slightly less sand should be used than ordinarily. As to the size of stone or gravel, this must be determined by the form of construction contemplated. For foundations or any large thick structure, use anything from ½ to 2½ inches in diameter. For thin walls use ¼ to 1-inch stone. The best results are obtained by the use of a mixture of sizes graded from small to large. By this means the spaces between the stones or pebbles are reduced and a more compact concrete is obtained. Moreover, this method makes it possible to get along with less sand and less cement.

Water for concrete should be clean and free from strong acids and alkalies. It may be readily stored in a barrel

beside the mixing board and placed on the concrete with a bucket.

If you are at all in doubt about the purity of the water that you contemplate using, it would be well to make up a block of concrete as a test, and see whether the cement "sets" properly.

For ordinary work a very satisfactory concrete mixture is 1 part of Portland cement, 2½ parts of clean sharp sand, 5 parts of broken stone. In heavy foundation work, the quantity of cement can be considerably less. The important thing is to have the sand and cement thoroughly mixed, and to use only clean sand. Use only as much water as necessary. It is not well to work concrete in freezing weather.

Cold Storage Without Ice

Why not have a cold storage room somewhere on the farm? Winter apples may be kept in such a place until spring, thus avoiding the necessity of marketing the fruit at unprofitable times. A Pennsylvania farmer has such a place built in one part of his barn—a double-walled, double-doored, paper-lined space wherein he stores many hundred bushel crates of selected fruit. He says that the main essentials are to keep out heat and frost from the room. On cool nights he leaves the doors open, shutting them again when the sun begins to warm things up in the morning—the idea being to use cold air instead of ice for reducing the room's temperature. He aims to get the temperature in the room as low as possible without freezing the apples, and then hold it there. Night air is cheaper than ice, he says, and about as good.

How to Make and Use a Fireless Cooker

A saver of time, fuel and labor is the fireless cook stove, which can be made at home, absolutely without expense, and, though not adapted to all kinds of cooking, answers well for food that requires long, slow cooking to soften tissues, bring out flavors and conserve the juices, such as stews, pot roasts, soups, cereals, rice, tapioca, dried fruits, vegetables, etc. It consists of a kettle of agate or tin, inclosed in a box with insulating material between them to prevent the heat of the kettle from escaping. Food brought to the boiling point over a fire, and inclosed, still boiling, continues to cook. This is the whole principle. Choose a kettle with tight-fitting lid and a box large enough to allow six or eight inches of insulating material. Line the box, bottom, sides and hinged-on lid with stout packing paper, or several thicknesses of newspaper. Make a firm, cylindrical shape to fit easily around the kettle and fasten a circular bottom to it. This might be of asbestos paper, or paper soaked in alum water and dried. Then no matter how hot the kettle there would be no danger of scorching. Fill the bottom of the box with packing, which can be of cotton, wool, ground cork (in which imported grapes are packed and which grocers are usually willing to give away). Hay will answer, but does not pack so closely as these. Pack hard to a depth of three inches, place the cylinder, containing the kettle in the middle, and pack tightly around it, even with the top. The insulating material can be covered neatly with cloth, or a thin board with a round hole in the middle. A thick cushion will insulate the space between this and the lid, which must be fastened down tightly. If desired to cook several things at once it is best to have two or three such cookers, as the box should not be opened after the food is put in, except to reheat. Some persons prefer using a sort of double boiler, the inner kettle, containing the food, being placed in a larger one, partly filled with hot water. In this case the water in both kettles must be actually boiling. An additional vegetable can be put in the outside kettle, or water kept hot in it for dishwashing.

Ready-made cookers can be bought, but are rather expensive. Some of these will also bake and roast by means of thick disks of concrete which must be made very hot on the stove, then put under and over the kettle containing the food. The idea might be applied to the home-made cooker by heating soapstone griddles. These might be heated at the same time with a large iron pot. The meat or chicken, which should be seasoned, can be put in a kettle, a hot disk put in the bottom of the pot, the kettle set on this; the other disk put on top, then put the lid on the pot and bury in the cooker. The pot, however, should be inclosed in asbestos paper to avoid possible ignition. It would be interesting for each housekeeper to experiment and invent improvements on the central idea. The time required for cooking vegetables varies according to their age and freshness, so only the approximate time necessary can be given. There is little danger of their being overdone, or at least injured by long cooking, and if underdone it is always possible to take out the kettle, reheat, and return to the cooker, or if needed quickly, to finish on the range.

It is not worth while to use the cooker for food that takes but a short time to cook, such as corn, spinach, young peas, asparagus, etc., since the water for these must be brought to the boil anyhow, they can as well be cooked on the stove. Do not place the kettle next the flame but always have a lid under it.

Potatoes

Five minutes over fire, an hour in the box. Potatoes must not be left overtime in box or they become watery.

Rice Pudding

Mix together in the kettle ½ a cupful of rice, a quart of milk, a tablespoonful of butter, ½ a cupful of sugar, a little salt and grated nutmeg. Boil on stove five minutes, in cooker six hours.

Bread Pudding

Soak ½ a pint of bread crumbs in a pint of milk, add a beaten egg, 2 tablespoonfuls of sugar and a pinch of salt. Beat with a spoon; heat on the stove till just short of boiling, stirring all the time. Put in the cooker an hour and serve with vanilla sauce.

Chicken Fricassee

Disjoint a chicken, roll in flour and brown in a little fat; as the pieces brown pack them in the kettle, and make some gravy in the skillet. Put this and a little water to cover the chicken. Boil twenty minutes, then put in cooker over night.

Boiled Ham

If wanted for 6 o'clock dinner, put ham weighing six pounds in kettle at 9 a. m. Cover with cold water and bring to a boil; boil briskly fifteen minutes. Put the lid on the kettle when it begins to boil and don't take it off till it is taken out of the hay box, in which it should be put while still boiling. At 2 o'clock take out, boil up again, put in a few cloves and 2 or 3 peppercorns. At 5.30 take out, skin, put in a pan, fat side up, stick in a few cloves, sprinkle slightly with sugar and plentifully with bread crumbs and bake in the oven till well done.

Onions

Of moderate size, boiled ten minutes on the range, should be tender after four hours in cooker.

String Beans

Cut off the strings and slice down the middle; give five minutes over the fire, four hours in cooker.

Cauliflower and Young Cabbage

Five minutes over fire, five hours in cooker.

Cereals started over the fire at supper time and placed in the box should be ready for breakfast with just reheating. Half a cupful of cereal poured into three cupfuls of boiling water, with a teaspoonful of salt is about the proportion.

A fireless cooker can be used for things to be kept cold as well as hot. Ice cream, if frozen, then packed in a kettle with ice and sunk in the box will not melt, and butter if put in it cool and hard will keep in the same condition, as the air is practically excluded.

Boston Baked Beans

Soak 2 cupfuls of beans in cold water a whole day. At supper time drain, cover with fresh water, put over the fire and simmer slowly for half an hour; pour off the water, scrape a ¼ pound of salt pork, cut off a slice and push it down through the beans to the bottom of the pail; score the rest and put, rind side up, in middle of the beans. Mix a teaspoonful of salt, a tablespoonful each of sugar and molasses, just a dust of mustard, a half teaspoonful of baking soda and a cupful of boiling water. Add enough more water to come to the top of the beans. Cover, and boil ten minutes; then put in cooker. In the morning reheat for ten minutes, return to the box and about half past five in the afternoon take out, sprinkle a tablespoonful of sugar over the top, leave off the cover, put in hot oven for half an hour.

Pot Roast

Season the meat with salt and pepper, brown on all sides over a flame, and put in a stone jar, dry, no water whatever. Cover tightly. Put the jar in a kettle of hot water. Boil fifteen or twenty minutes. Place in a cooker for six hours. Even tough meat becomes tender and the juice at the bottom is very rich.