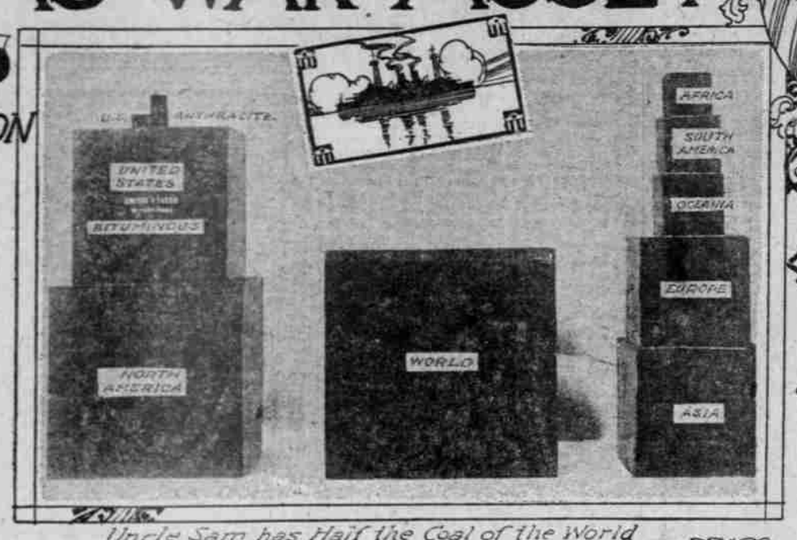
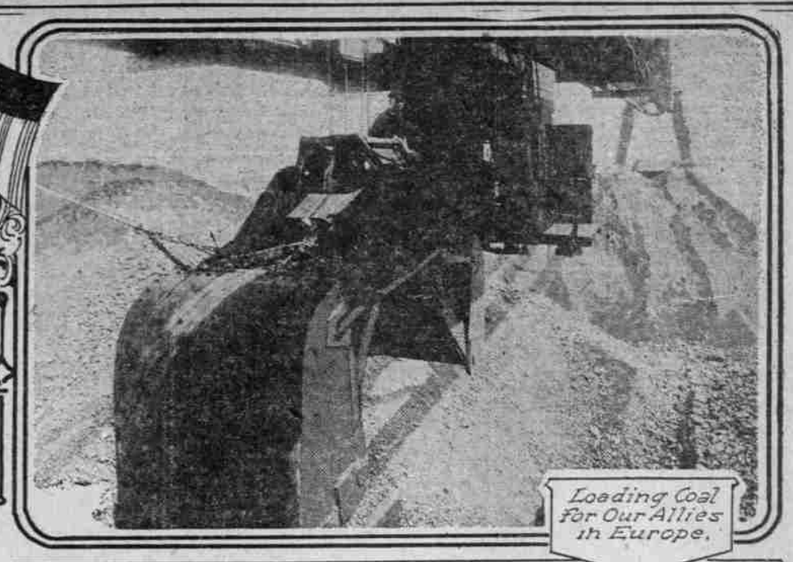
OUR COAL AS WAR ASSET

WE CAN FIGHT FOUR THOUSAND YEARS AT OUR PRESENT RATE OF CONSUMPTION

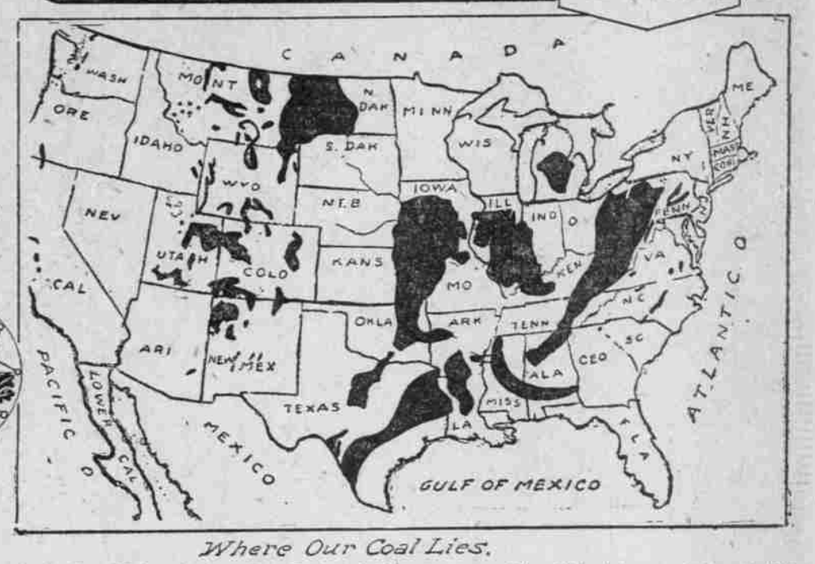
BY FRANK G. CARPENTER.



Uncle Sam has Half the Coal of the World



Loading Coal For Our Allies in Europe.



Where Our Coal Lies.

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WASHINGTON, D. C., Feb. 2.—The age of muscle-fighting has passed. The age of machine-fighting has begun. This war is being waged by machinery, and in machine-fighting the greatest of assets is coal. The war is not confined to the battle-field. For every soldier sent to the front there are 10 behind the lines. They are to be found in our steel mills, our machine shops, our munitions industries which give us our supplies. All of these are based upon coal, and if wars are to continue and nation is to fight to the death against nation, the nation that will finally survive is the one that has the most coal.

On that basis let us see where we stand. In order to give you the best information I have gone over the situation with the experts of the fuel administration and the geological survey. They have been studying the resources of the United States, and can tell us just where we stand. They know about every coal field in Europe, and they know about all the coal deposits on this big, round earth.

According to estimates made by the international geological congress which met in Toronto, Canada, just before the war began, the whole world has altogether just about 8,000 billion tons of coal and of that this United States has more than one-half. Three-fourths of all the coal upon earth is to be found in the North American continent, and the bulk of that outside the United States belongs to our Canadian allies. They have just about one-fourth as much as we have. The continent of Europe has only one-sixth as much coal as North America and only about one-fifth as much as our country. The whole of Asia has only one-third as much coal as we have, and Australasia and Africa put together have less than one-sixteenth of the coal reserves of the United States. It will thus be seen that as far as coal is concerned we could fight the whole world and have billions of tons of fuel left after the supplies of all the other nations have been exhausted. Dr. Charles G. Gilbert, curator of the bureau of mineral technology of the National Museum of Washington, has prepared a graphic coal exhibit of the resources of the United States and the world. He has made blocks showing the proportionate amount of coal in the various countries, and it rejoices one's soul to see how our great block could swallow that of any other country on earth and leave a vast space around the edges.

The whole is a practical illustration of our industrial future. It shows that North America for the next few thousand odd years must be the industrial center of the world, and that the United States must forever be the heart of that center. As for the coal famine of today, that is a temporary matter. It is due to not getting the coal out of the ground, and the war troubles in placing it in the hands of the consumer.

For those who can comprehend figures I give herewith, in round numbers, in billions of tons, a table prepared by the congress I have referred to, showing how the coal-producing countries of the world stand as to their coal reserves. This table is not made up by United States authorities. It comes from the geological experts of every country, and that in congress assembled. It may be relied upon as correct:

	Short tons.
U. S., including Alaska	4,221,000,000,000
Canada	1,300,000,000,000
China	1,097,000,000,000
Germany	400,000,000,000
Great Britain and Ireland	200,000,000,000
Siberia	191,000,000,000
Australia	143,000,000,000
India	97,000,000,000
Russia in Europe	92,000,000,000
Union of South America	61,000,000,000
Austria	58,000,000,000
Columbia	29,000,000,000
Indo-China	22,000,000,000
France	19,000,000,000
Other countries	62,000,000,000
Total	8,147,000,000,000

From this it will be seen that we have more than nine times as much coal as Germany and more than 20 times as much as Great Britain. The only countries that compare with us in our wealth of black diamonds are Canada and China, and so far their mines are practically undeveloped. With the exception of one or two mines, the great coal fields of China are not used at all. In many places the coal for local consumption is dug out with picks, and in some of the Chinese cities coal is so valuable that it is ground to dust and mixed with dirt and sold in balls the size of a biscuit. There is no mention here of the mines of Japan. That country has some excellent deposits, but they are hard to mine. During my travels there I visited a coal property at Nagasaki, which has 50 miles of tunnels under the Pacific Ocean. That coal is being taken out for the Japanese navy. It is the same in South America. The chief coal mines of that continent run under the ocean off the coast of Southern Chile. I have visited those mines, riding on an electric road under the Bay of Concepcion, with the ships sailing about overhead.

Siberia has almost as much undeveloped coal as the amount left in the mines of Great Britain. For years England has been the center of the coal production of the world, and for a long time it furnished half of the coal used by mankind. It has long since exhausted the supplies near the surface, and the miners are now working hundreds and in some cases thousands of feet below ground. The coal veins are thin. In some of the mines the men have to lie on their sides to pick the coal out. The rich Newcastle field has veins from three to six feet in thickness, and many of the Wales veins are only three feet thick. Some of our Pennsylvania veins are from 30 to 60 feet thick, and the bituminous coal near Pittsburg measures from eight to 16 feet, while in the coal fields of Alaska we have great beds which are 40 feet thick.

And now let us look at our own coal reserves. I have before me some figures made this year by Dr. Marius R. Campbell, one of the leading experts of the geological survey. They will show us how much coal we have and how long it will probably last. We need not be worried about the immediate future. The amount so far used is only four-tenths of 1 per cent of our available supply, and we shall be mining coal down to our grandchildren of 10 generations or more. We can keep up our present rate of production, including all the coal we are taking out for fighting the Germans, for three or four thousand years, and still allow an enormous amount for waste in mining and handling.

Some of the mines of Belgium which are now worked by the Germans are 4000 feet deep. They are the deepest coal mines of the world, but the mining of the future probably will be carried to a depth of 6000 feet, or more than a mile underground.

The estimates of Dr. Campbell as to our available coal include those down to a depth of only 3000 feet, or a little more than one-half mile below the surface. His estimates run into the thousands of billions of tons. I shall not give them in figures, but Dr. Campbell says the amount is so great that if it could be dragged forth and laid in one pile as solid as it now lies in the ground it would form a cube more than 18 miles wide, 18 miles thick and 18 miles high.

But even that pile is too big for the eyes of a small mind like mine. Let us build up the coal into great fortifications around our own boundaries. There is coal enough in the ground to make a wall a mile wide and half a mile high around the outside of the United States and leave some to spare. The length of our boundary, according to the coast and geodetic survey, is less than 11,000 miles, and this wall of coal would be almost as much longer as the distance from New York to Chicago. Or we could cut the wall down and run it around the United States in a series of great fortifications with wide trenches between. Suppose we made it 500 feet thick and 500 feet high, or as tall as the Washington Monument, which no tank could climb over. The great wall of China, built to keep out the Mongols, is only 40 feet high. This wall of coal would be 12 times higher. That wall at the top is less than 25 feet wide; this wall would be 20 times thicker and it would be more than 400 times as long. Its actual length would be more than 630,000 miles, over twice as far as from here to the moon, with enough left to make a girdle six times around the earth. That wall would go 60 times around the whole United States or we could build it up in 60 great walls, each as high as the Washington Monument, with factories and munition plants between. With that wall we could make a line of such fortifications reaching all the way between us and Canada all along the boundary which separates us from our sister republic of Mexico. We would have enough to extend the line back off the Pacific from the top of Puget Sound to Lower California, and along the whole length of our Atlantic Coast from northernmost Maine to southernmost Florida, and border the Gulf of Mexico as well. Talk about the Hindenberg line! One fortification of those 60, with its great height and thickness, would be enough to keep out the Germans for all time to come.

And now suppose we add to the wall the small amount of coal we have mined. If we should take every black diamond we have dug from the earth since our first mines were worked, near Richmond, Va., until now, the amount would extend the fortifications less than 50 miles longer. It would only be four-tenths of 1 per cent of the whole.

These figures are amazing. Nevertheless, according to Dr. Campbell, they include our coal to a depth of more than 3000 feet, and as the coal grows scarcer and scarcer we shall carry our mines down almost double that distance. We might add 50 per cent to the estimates of our possible coal supply and not be far out of the way.

Moreover, the coal fields of the above estimates include only those of the United States proper. They leave out the enormous coal beds we have in Alaska, some of which are being opened up by the new railroad now building. We have both anthracite and bituminous coal there and a vast amount of lignite, which may be more valuable in the future. I saw something of the coal fields during my recent trip to Alaska and I have talked about them with Dr. Alfred H. Brooks, who has spent more than 15 years exploring the territory and who knows more about geology than any other man on earth. He says a low estimate of the coal we have there would be 150,000,000,000 tons, which is just about 250 times as much as the coal we used in 1917. Of course, a great part of the Alaska coal does not compare in quality with that we now mine, but the territory has great beds of good coal and the railroad has already reached the Matanuska fields, which have fuel fit for the Navy.

And now let me tell you something about the coal we have in the United States proper and just where it lies. Our deposits here are about the best on earth. There is none that compares in extent and heating qualities with the anthracite bed of Northeastern Pennsylvania, and we have the Pocahontas and other bituminous coals, which are fully as good, if not better, than the famous Cardiff coal of England, which has been the chief steaming coal since the time steam began to be used. We have every grade of coal from this costly high-powered anthracite down to the lignite or brown coal, which the Germans are making into briquettes for their railroads. The fuel administration is urging that we buy our coal from the mines nearest us and that we do not use fuel that requires a long haul. The fact is coal requires more cars than anything else on the railroads. It constitutes 35 per cent of all the freight carried, and in the eastern part of our country it amounts to more than 33 per cent of the tonnage. We are now carrying three tons of coal to every ton of farm products, and this is so notwithstanding coal is mined in 26 states of the Union. There is scarcely a place in the United States farther away from a coal mine than a day or so by fast freight.

It will surprise many to know that the great bulk of our coal lies west of the Mississippi River and that the most of it is in the northern half of the great plains and in the Rocky Mountains. The Rocky Mountains have more coal than all Europe, and the good coal of the great plains is three times that of Germany. There are 500,000,000 tons of anthracite in the Rockies, and that part of the country has plenty of good soft coal as well. The amount runs high into the billions of tons. It includes more than one-fourth of the bituminous coal of the United States, and that means coal that will make steam and can be used to make coke.

There are about 11,000,000,000 tons of good soft coal in Oregon, Washington and California and something like 45,000,000,000 tons in the northern part of the great plains. All of that coal is good for steaming, and this means that those regions will sometime become industrial centers.

Our greatest deposits of bituminous coal lie in the Mississippi Basin and the Appalachian Mountains. It is from those regions that we have gotten the coal supply of the past and from there comes the bulk of the coal of today. The Appalachian Mountain region has a great bed of soft coal which begins in Pennsylvania and Ohio and runs south through Kentucky, West Virginia, Tennessee and Alabama, almost to the Gulf of Mexico. That bed has some of the best coal of the world, and there is enough of it to supply all the industries of the East for hundreds of years. So far we have not mined more than one-tenth of it, and there is still in the neighborhood of 500,000,000,000 tons within 3000 feet of the surface.

As to our anthracite coal, which lies in Northeastern Pennsylvania, we have not used more than one-fourth of the whole. At the time the mines were discovered the deposits contained something like 21,000,000,000 tons and there is still more than 17,000,000,000 within 3000 feet of the surface.

It is the anthracite coal which more than anything else is causing our present congestion of freight and indirectly the coal famine. The coal is about the best in the world as far as domestic use is concerned. It has a great heating value and it burns without smoke. The result is we all want anthracite and the freight clogs the railroads. The fuel administration is urging the people to use less anthracite and to get their supplies from the bituminous coal fields nearby.

We are now using a large amount of semi-bituminous coal for the Navy. This coal is of a higher grade than bituminous coal, and it is almost smokeless if it is properly burned. It has a high heating value and is regarded as the best for naval use. This was not the opinion of the late Admiral Bob Evans. He preferred anthracite, and advocated that the Government should reserve the entire anthracite field of Pennsylvania for the purpose of National defense. He wrote an article about it in the North American Review, in which he said:

"Anthracite is the ideal fuel for American naval purposes. It makes no smoke, and smoke is the telltale signal which betrays the warship." Admiral Evans said that Admiral Dewey came near losing the battle of Manila Bay because he had left coal in his furnaces. He chose the night for coming into the bay, thinking that the darkness would disguise his approach and conceal from the enemy the dense clouds of black smoke emitted by his ships. Nevertheless at the critical moment one of his vessels spouted up blasts of flame and drew upon her the fire of the great guns on Corregidor Island, at the mouth of the bay. This was the little McCullough, which was at the rear of the fleet. It was fortunate that she had that position and that all the fighting ships had passed beyond the range of the fort before she hung her fiery warning out in the skies.

And this brings us to the coal we are using today. Our consumption has rapidly increased since the war began, and to supply the demand of next year we ought to mine and ship half again as much coal as we mined in 1914. The amount we should have for ourselves and for export is said to be 750,000,000 tons. We mined more than 600,000,000 tons last year, and, notwithstanding the shortage over the country, our output is now greater than ever before. Not only do we need more coal for our factories on account of the day and night speeding up for the war, but something like 150,000,000 tons of coal could be profitably used by our allies, and especially Italy and France, which are now in the throes of a coal famine. We need more tons for the Navy and a great deal is required for the ships which carry supplies from this country to France.

It is interesting to see where our coal goes. Only about one-fifth or one-sixth of the whole is used for heating our houses, hotels, schools and office buildings of one kind or other. We now consume annually about 100,000,000 tons for that purpose and this includes both anthracite and bituminous coals.

The great bulk of the coal is used for industrial purposes. About 70 per cent of it went to the making of steam in 1915, and of this one-third was used by the industrial steam plants. We used about one-fourth of all the coal mined for running the railroads, and we burned something like 62,000,000 tons in the coke ovens to get the materials for smelting our steel. There has been a steady increase in the demand for soft coal since the war broke out and our output has gone up with the demand. In 1915 it was 20,000,000 tons more than the year preceding and in 1916 that increase had trebled. It again increased in 1917 and there undoubtedly will be a great increase this year. According to Dr. C. E. Lesher, the coal expert of the United States Geological Survey, we need a ton and a half of coal to make the coke for every ton of pig iron we produce, so that the increased demand for steel will necessitate the use of a vast deal more coke.

Indeed, the industrial demands of the war are increasing our production of coal as never before. We have mined almost a million and a half tons of coal daily throughout the past year. The total amount has been in the neighborhood of 640,000,000 tons, or enough, at 50 tons to the car, to make 16 solid trains of coal reaching from San Francisco to New York and thence across the Atlantic Ocean to where our soldiers are fighting in France, with several thousands of miles of coal cars to spare. Of that coal 550,000,000 tons were bituminous, the greater part of which was used for our industries and the railroads. About 90,000,000 tons of it was anthracite, some of which was employed in manufactures, but a great deal for heating our houses. The most of the coal was used in industrial centers and more per square mile in Pennsylavnia, New York, Ohio and Maryland than anywhere else.

The coal experts say that the question of a famine in coal is largely one of insufficient transportation facilities. We have enough mines open and new mines could easily be brought in if necessary so as to keep pace with our needs. We have an industrial army of coal soldiers of almost three-quarters of a million, and it is important that this force should not be further reduced by the draft. According to John P. White, the president of the United Mine Workers, there is now a shortage of 25,000 miners in the anthracite fields, and the shortage in the bituminous fields of Pennsylvania, Ohio, Indiana and Illinois is more than 30,000. There has been a falling off of labor in the West Virginia coal district, and if these decreases continue the famine in coal will grow worse than ever.

Modern Poultry Culture

The occasional loss of a hen that to all appearances is in good health, is a common experience of most poultrykeepers. In the majority of cases little attention is paid to such a loss, because the owner is not sufficiently informed to reach a conclusion as to the specific cause of the mortality. If death is brought on by some simple non-contagious malady, or through accident, no particular harm is done; but should the disease be of such a nature that the rest of the flock is more than likely to be infected, the failure to take cognizance of these occasional deaths may mean the loss of a number of birds. Efficiency demands that the poultrykeeper have a general knowledge of the external and internal manifestations of disease.

By Charles L. Opperman, Formerly State Poultryman of Maryland

WE do not need to concern ourselves very much with the fowl that is in good health, for almost everybody recognizes the indications of health and vitality. Birds in this condition are active; they rise early and go to roost late; their eyes are bright and clear; when not in the molt their plumage is smooth and glossy, their wattles and earlobes are full and bright and they present a neat, compact appearance, indicating that the body framework is well covered with flesh. It is, of course, true that a bird may come up to these specifications and at the same time be affected with some form of disease. However, this conditions is not common and need not be given any serious consideration. With the exception of apoplexy and similar diseases, there are very few disorders which the poultrykeeper may successfully combat, that do not manifest their presence by the outward appearance of the fowls.

External Indications.

There are two ways in which the poultrykeeper may determine the cause of death. First, by external symptoms; second, by a careful post-mortem examination.

There are a number of general symptoms that may be observed in connection with most of the common diseases of poultry. Such things as sleepiness, loss of appetite, drooping wings, pale comb and eyes, ruffled feathers and so on all indicate a diseased condition, yet in themselves they furnish no reliable clue to the true nature of the disease. Birds which exhibit one or several of these symptoms should be removed from the flock at once and carefully examined in order to obtain a more precise diagnosis.

In making a diagnosis the analysis given below will be found helpful in identifying the disease. In compiling this data the writer has purposely omitted a number of the rare and unimportant diseases, and confined the text largely to the common ailments with which the poultrykeeper has to contend.

Abnormal breathing, wheezing, whistling, snoring and coughing: Colds, catarrh, canker, gapes, air-sac mite.

Mucous discharge from nostrils: Roup, catarrh, colds.

Mucous discharge from mouth; Pneumonia, congestion of the lungs, gapes.

Nausea and vomiting: Inflammation of the crop; copper, lead or zinc poisoning.

Mass of inflamed tissue projecting from vent: Prolapse of oviduct.

Paralysis: Poisoning, heat prostration, apoplexy.

Rough legs, scales raised and uneven: Scaly leg.

Scale and incrusted skin: Body mange.

Staggering: Congestion of brain, leg weakness.

Swollen face and eyes: Roup.

Tumors on head: Roup, chicken-pox.

Watery eyes: Roup.

White patches on mouth and throat: Canker, roup.

Yellow droppings: Cholera.

Choking: Arsenic poisoning.

Convulsions: Poisoning, epilepsy, harvest bug.

Constipation: Simple constipation, indigestion, inflammation of the oviduct.

Diarrhea: Poisoning, blackhead, cholera, tuberculosis, roup, white diarrhea.

Dark comb: Liver diseases, congestion of the lungs, blackhead, pneumonia.

Emaciation: Tuberculosis, viscual gout, mites, diarrhea.

Excessive thirst: Enlargement of the liver, peritonitis, aspergillosis.

Hard, dry tongue: Pip, diseases of the respiratory system.

Hard, full crop: Crop bound.

Lameness: Rheumatism, bumble foot, scaly legs, tuberculosis, leg weakness.

Limp neck: Limber-neck.

Internal Indications.

It frequently happens that a bird will die without cause so far as external indications are concerned, and in such instances a post-mortem examination is necessary to properly diagnosis the case. First lay the bird, back down, on top of an old table or box. Next spread out the wings and legs, driving a small nail through the joint of each wing and through the center of each foot. The feathers should be plucked from the breast and the skin cut in a straight line from crop to vent. The skin is then drawn from back from each side, leaving the flesh exposed. The entire breast is now removed by cutting the ribs on each side and the two large bone joints at the front end of the breast. This operation will expose most of the organs and intestines for examination.

Liver. The post-mortem examination should begin with the liver. In a strong healthy bird the liver is a chocolate brown color and free from nodules spotted areas or discolorations.

In hypertrophy or enlargement of the liver, this organ will be enlarged, deep red in color, engorged with blood and rather firm under the knife.

If the liver is shrunken, hardened, and marbled or spotted with areas of grayish or yellowish tissue, the trouble would be diagnosed as fatty degeneration.

In blackhead the liver is enlarged and covered with whitish or yellowish spots.

In young chicks dying from white diarrhea the liver will be pale in color and streaked with patches of red.

When death is caused by viscual gout, the liver will be covered with a fine chalky sediment.

Heart. The heart should be firm, free from excessive fat and the nodules of tuberculosis. It should also be evenly lobed.

When the heart is found distended on one side and empty on the other, the probabilities are that the bird died of heart failure.

In the case of enlargement of the heart, this organ will be found distended, especially on the right side. In some instances the muscles are fatty and degenerate.

If the bird died from internal hemorrhage, the heart or one of the large blood vessels will be ruptured.

Lungs. The healthy lung should be spongy and pink in color. Healthy lung tissue will float in water, while the diseased tissue usually sinks.

In pneumonia the lungs will be dark in color, engorged with blood and solidified. If a piece of one is placed in a pan of water it will sink to the bottom.

When the lungs are found to be covered with whitish or yellowish nodules, varying in size from a pinhead to a pea, the disease should be diagnosed as aspergillosis, and not tuberculosis, since the latter malady rarely, if ever, attacks the lungs.

Windpipe or Trachea. When young chicks die from the gapes the walls of the windpipe will be found studded with small red gape worms.

Intestines. In bad cases of diarrhea the intestines will be found greatly inflamed and full of mucus.

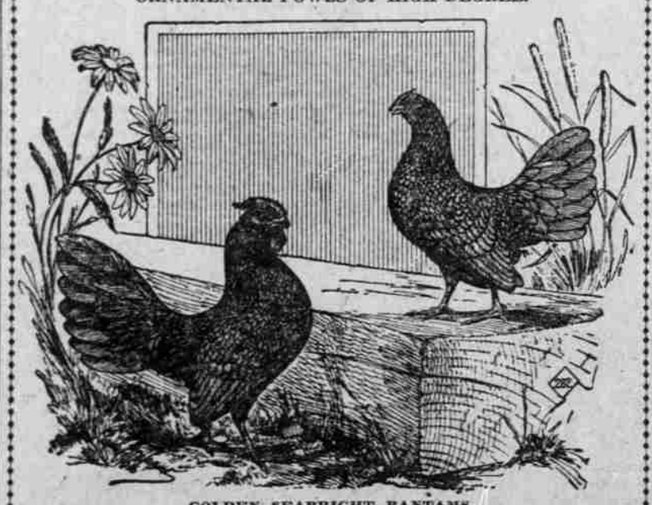
Where intestinal worms or tape worms are suspected, the intestines should be cut open with a small pair of shears and the contents emptied in a bowl of water. If worms are present they can be easily detected in this manner.

In tuberculosis the intestines and surrounding tissue will be found dotted with small whitish or yellowish nodules.

Reproductive organs. In gangrene of the ovary, the ova are found to be brown or black, while in a healthy state they are yellowish pink in color.

If death has been caused by a ruptured oviduct, one or more eggs in various stages of decomposition will often be found in the body cavity.

ORNAMENTAL FOWLS OF HIGH DEGREE.



GOLDEN SEABRIGHT BANTAMS.

Golden Seabright Bantams are essentially an ornamental breed, for both eggs and carcasses are too small for commercial purposes. Sir John Seabright, an Englishman, spent a lifetime originating and perfecting the breed. Later, in 1820, a club was formed for their advancement.

Mature male Seabrights should not exceed 26 ounces in weight, and females 22 ounces. They have small, firm rose combs, short blue legs, drooping wings, well-spread fan tail and an alert, upright carriage. The male must be "hen feathered," that is, the tail is devoid of curving sickle feathers, which denote the male in other fowls, and the feathers of the neck hackle and saddle are not pointed, as in other cocks. This hen feathering is the distinguishing feature of the Seabright Bantams. The plumage is described as golden bay, each feather distinctly outlined with a narrow edge of glossy black.

"IWANTA" MALADY RAGES

Bad Epidemic Reported in Washington; Adults Affected Most.

WASHINGTON, Dec. 23—The ancient malady that is sweeping the world today, has arrived in Washington. They're all getting the Iwantas. Along F street, small boys tagging along after their mothers, are afflicted to a terrible degree. Every window, in holiday attire, every street vender, catches their eye. Then ensues a struggle.

"Ma, Iwanta piece of candy."

"Mother, iwanta rocking horse."

"Ma, iwanta soldier's suit and a gun and—"

The malady has afflicted the Government service. Army and navy officers meet in their offices, their homes, hotel lobbies and on the streets.

"Iwanta commission in the Reserves."

And the average Washingtonian has it even more terribly than his children. His is a particularly bad case. One hears it especially in those palaces where "the merry elbow used to be crooked in good cheer" by both young and old. Here is the way it affects them.

"Iwanta vote."

And the sweet young things whose are in cantonements and th Franc other halfs and bope-to-be other halfs have a plaint.

"Iwanta picture."

"Iwanta Hun helmet."

"Iwanta soldier button."

"Iwanta be drafted" is the only thing one does not hear.

Greatest Danger From Within.

Boy Scout News.

As a democracy, our country faces great danger—not so much from submarines, battleships and armies. Thanks to our allies, our enemies have apparently little chance of reaching our shores. Our danger is from within. Our enemies have representatives everywhere. They tell lies; they misrepresent the truth; they deceive our own people; they are a real menace to our country.

Fortunately here in America the people are better educated—they want the truth. The President knew that the Government would need the confidence, enthusiasm and willing service of every man and woman, every boy and girl in the Nation. He knew that the only possible way to create a genuine feeling of partnership between the people and its representative in Washington, D. C., was to take the people into his confidence by full, frank statements concerning the reasons for our entering the war, the various steps taken during the war, and the ultimate aims of the war.