★ Smile a Minute . . .

"You have caused a great deal of discussion."

"Yes," answered Senator Sorghum. "Public interest requires that a man in my position shall either investigate or be investigated."

February Sale

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NATURE NOW

# A Lump of Coal Is A Wondrous Thing

By LYDIA KING FREHSE
Special Writer for The Birmingham Eccentric

The luxuriant vegetation of the carboniferous period which was described in last week's column, reached its culmination in Pennsylvanian times. During this period the great beds of bituminous and anthracite coal of the northern hemisphere were laid down.

If you trace the 40th parallel, you will girdle the earth with coal. These deposits made some 200-300 million years ago furnish us with more than two-thirds of the world's supply.

However coal deposits are widespread over the earth. In the past the process of coal making was continuous wherever peat was formed even as it is today in such areas as the Dismal Swamp.

Mrs. Frehse

Many of the deposits in the western United States were laid down during cretaceous times some 75 million years ago—others laid down during the tertiary 30-60 million years ago were made by plants very similar to those which we find growing in our present-day peat bogs.

THE FIRST stage in the formation of coal took place when an accumulation of vegetable matter settled down in stagnant water forming peat. Under these conditions it did not decay as it does when exposed to the air but retained some of its carbon content.

These deposits were then sealed in alternate layers of sand and mud washed down from higher ground. As the sediments were slowly changed to stone, the plant material was subjected to ever-increasing heat and pressure thus increasing its density.

Another factor in its transformation was the intense heat and pressure generated by the tremendous earthquakes which from time to time shook the earth's crust.

There are many kinds of coal ranging from very crumbly lignite through various degrees of soft or bituminous coal, to hard coal or anthracite.

IN THE formation of these there is a progressive elimination of oxygen and hydrogen (partly as carbon dioxide and marsh gas) and a proportionate increase of carbon. Under extremes of heat and pressure coal turns into graphite which is pure native carbon in non-crystalline form.

Bituminous or soft coal holds first place among all other fuels for supplying the heating and powers needs of the nation. It generally contains a high percentage of volatile matter, ignites easily and burns with a smoky flame.

Of all coals, the best qualities of bituminous will produce the greatest quantity of heat units. When its volatile matter is driven off in closed ovens, coke is formed. This resulting product is almost pure carbon and is a superior fuel for melting iron ores, iron and steel.

CANNEL is a high quality, "non-coking" bituminous coal which because it lights easily and burns with a clear hot flame is much used in fireplaces. It owes its fatty nature to the fact that it was formed from the spores of the ancient plants which were described in last week's column. If our supply of petroleum and natural gas runs out, cannel coal will be an important source for obtaining substitutes.

Soft coals are widely distributed in the United States in seams from an inch to 15 feet in thickness. Our largest deposits are in Pennsylvania, Maryland and Virginia.

Anthracite is the most rock-like of all our coals. It is mined in large pieces, black and shiny. Because it contains a low percentage of volatile matter, it burns slowly with a short flame, makes little smoke and is very desirable as a household fuel.

GEOLOGISTS believe it was formed under the heat and pressure which accompanied the folding and upheaval of the earth's crust during the mountain-making periods. Our most important deposits of anthracite are in Wales and Russia and in the state of Pennsylvania.

The United States is the greatest coal producing country in the world with some 550 million tons mined each year.

There are also tremendous coal reserves, such as those in Alaska, which remain undeveloped. At our present rate of consumption we have enough to last some 4,000 years.

Since we are already tapping tremendous new sources of energy such as that provided by the atom, our need for coal as a fuel may be greatly altered in the future.

Coal is made up of carbon, hydrogen and oxygen with small amounts of sulphur, nitrogen and inorganic materials.

CARBON is a complex substance but briefly it may be spoken of as fixed carbon and volatile matter which consists of gaseous hydrocarbons.

Very soft coal such as lignite may contain only 32 per cent of fixed carbon while a good grade of anthracite may contain as much as 94 per cent.

When coal becomes hot enough to ignite, the carbon is oxidized and energy, in the form of heat, is released. During burning, such products as carbon dioxide, water, sulphur dioxide and nitrogen are given off. The remaining ash is non-combustible silicates and carbonates.

We have long depended upon coal for our physical comfort and economic progress.

NOW, A LUMP in the hands of a modern chemist, has become a magical material which can be converted into many and revolutionary products which formerly "went up in smoke". In the manufacture of coke such by-products as tar, light oils and ammonia are obtained from its gases and vapors. These are the raw materials much used by the chemical, pharmaceutical, textile and plastics industries.

Some of the resulting products are synthetic rubber, nylon, tobacco seasonings, saccharine, synthetic vitamins, dyes, fertilizer, insecticides, perfumes and plastics. Other derivatives are the miracle "sulpha" drugs, now so effective in medicine.

We are 200 million years removed from the fantastic vegetation of the carboniferous swamps. But the secrets which nature locked in a lump of coal in that far-distant age are now being released to us in new ways of ever-increasing importance to our well-being and progress.


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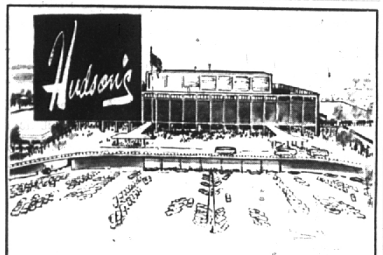


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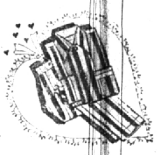

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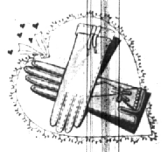

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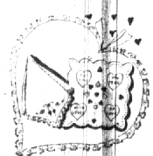

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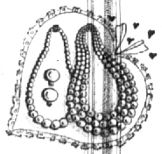

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