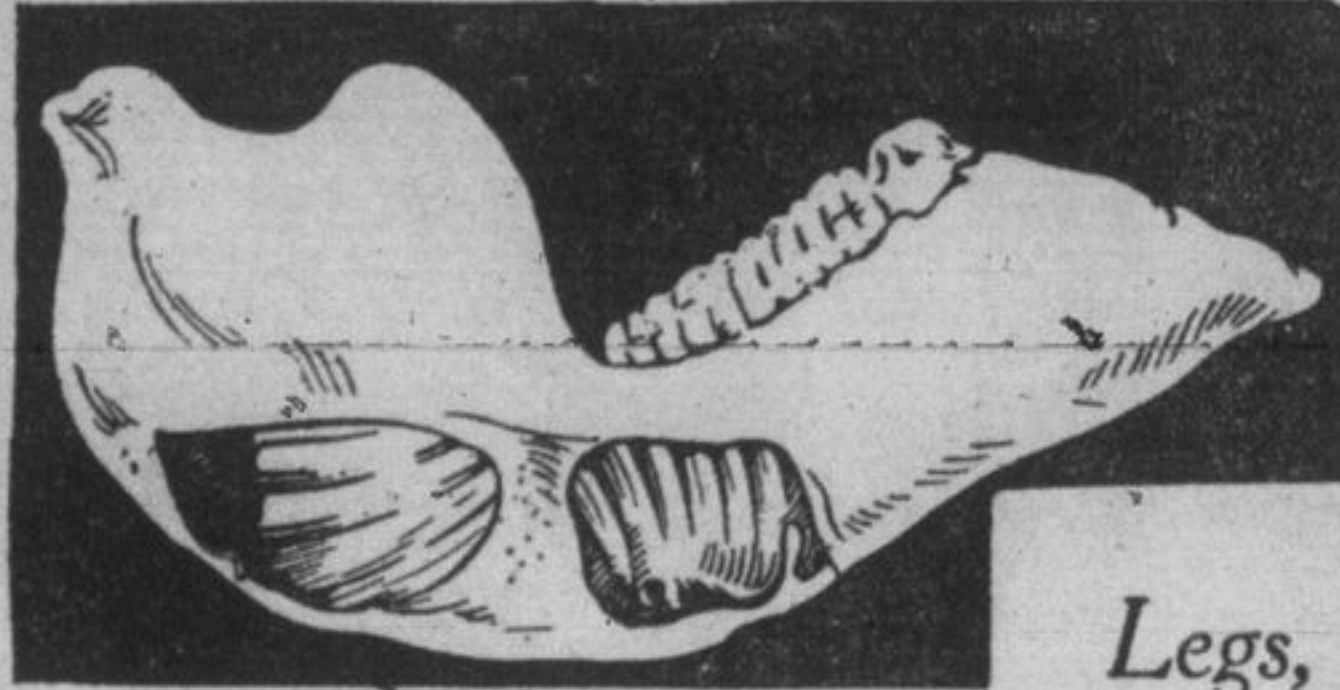


# New and Interesting Facts from Science and Life



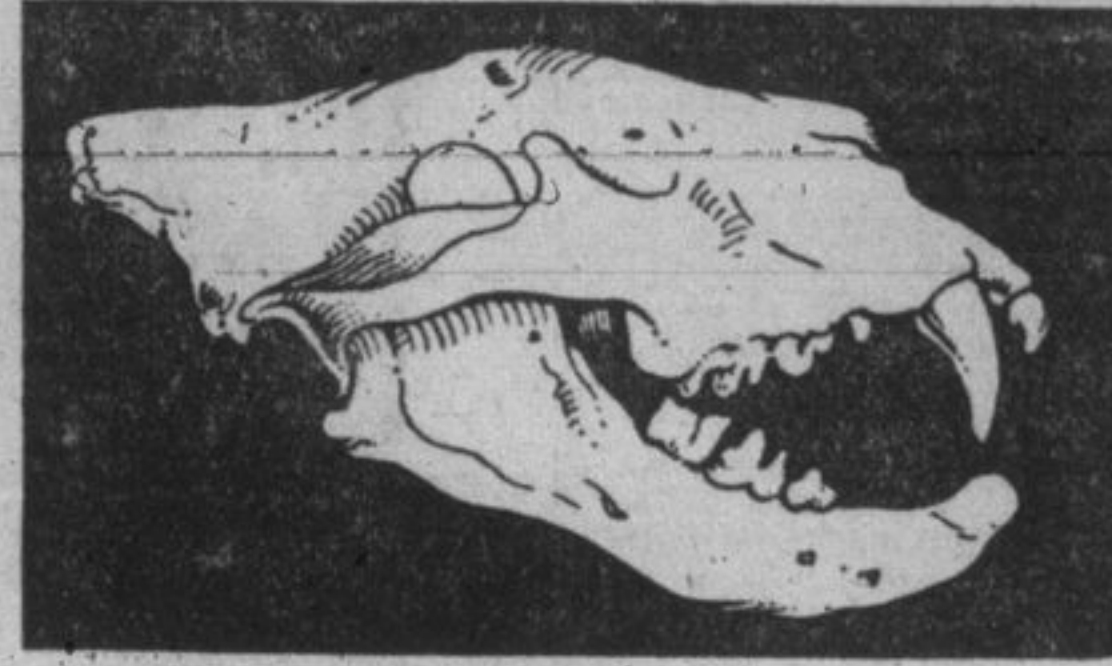
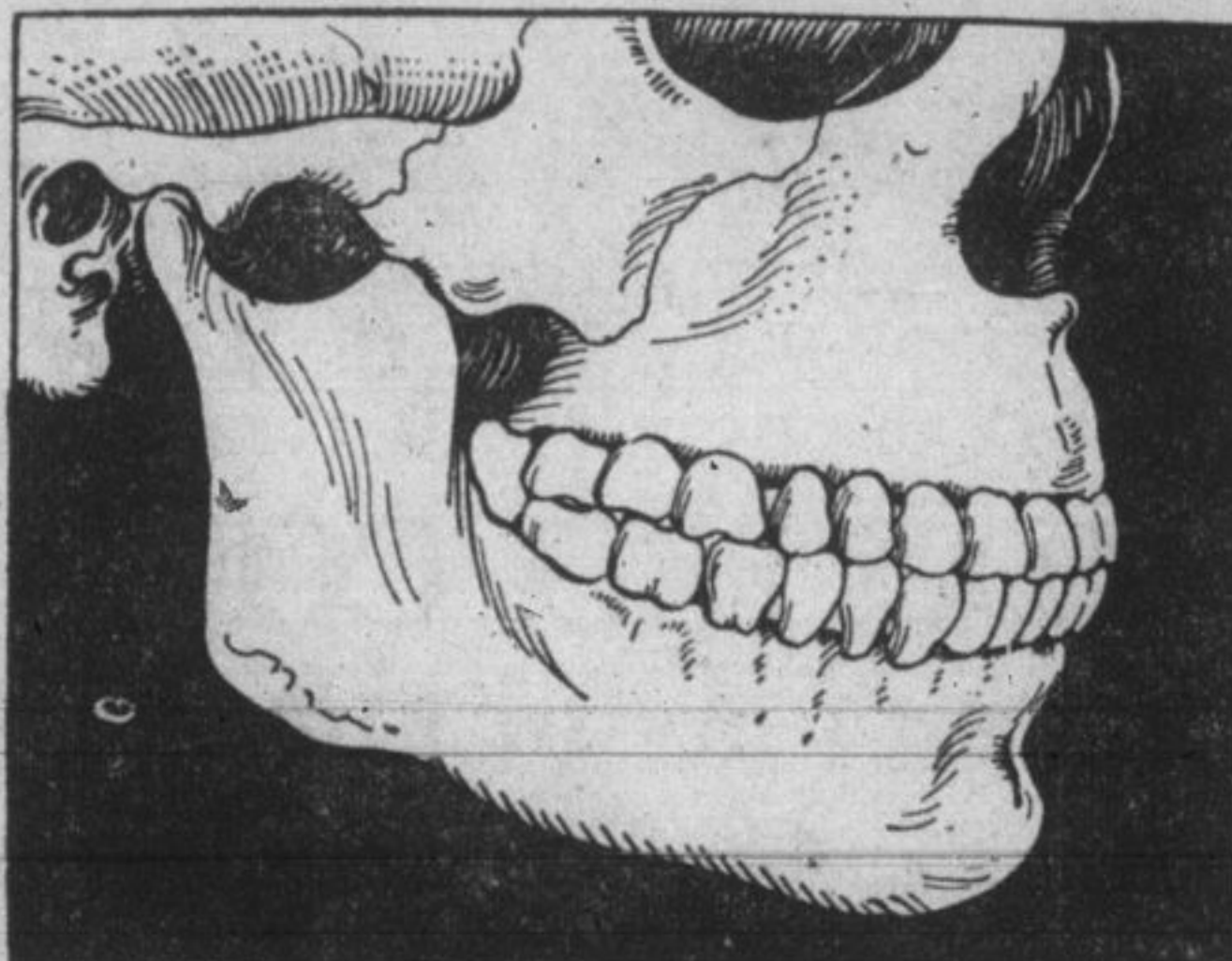
The Elephant Uses Only Two of These Grinders at a Time.

Of the kinds and sizes of teeth there is no end—seemingly. The truth of this statement is indicated by an interesting exhibit of teeth recently installed in the American Museum of Natural History in New York city. A study of this exhibit not only shows how all creation chews, but also imparts much information about the structure of teeth, their location, mode of implantation, growth and replacement.

A bulletin issued by the museum contains a description of the odd varieties of teeth shown in the exhibit, from the complicated apparatus called "Aristotle's lantern," worn by the sea-urchin, up to the fangs of the lion. The former consists of five pyramidal jaws, each carrying a long, slender tooth of continuous growth, which moves forward in the jaws as it wears away at the point. The horseshoe crab wears his teeth on his legs, at the first joints of which is a series of spines and sharp points. The food is torn to bits on these and worked into the mouth-opening. The lobster's teeth are to be found on his fourth to ninth appendages. Some of them are adapted to seizing the food, others to grinding it. The exhibit also reveals the little-known fact that the beetle and worm boast teeth as useful and efficient as any. Quoting further from this bulletin: "There are teeth of many kinds, but the typical tooth of a vertebrate or back-boned animal, consists of pulp contained in a cavity, which by deposition of lime in its exterior portion becomes dentine, ivory, or bone, forming the body of the tooth; enamel, overlying the dentine on the crown

## HOW ALL CREATION CHEWS

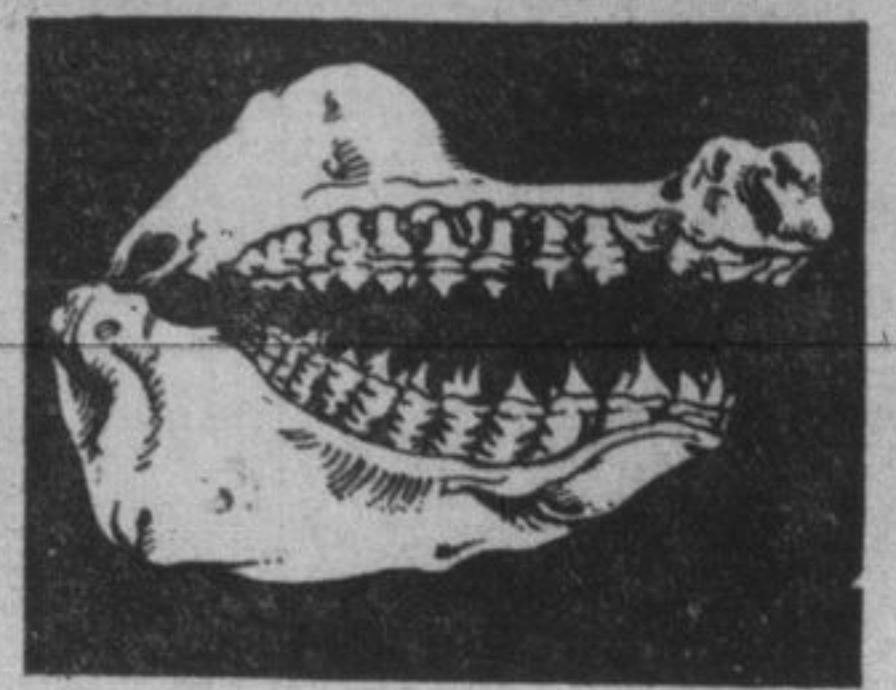
Animals That Have Teeth in Their Stomachs, or on Their Legs, and How They Seize and Grind Their Food.



The Powerful Jaws of the Lion.



The Horseshoe Crab Has Teeth on Its Legs.



The Shark's Rows of Vicious Teeth.

can be worn with propriety. The frog grows teeth only on his upper jaw. The animal known as Hoffman's sloth has teeth only on the hinder parts of both jaws. The gazelle's teeth are permitted to grow on both jaws, with the exception of the front of the upper jaw. Despite these and similar eccentricities, however, most animals, including the majority of mammals, have their teeth grow continuously on the edges of both jaws.

"Of course the form and arrangement of the teeth of some animals differ to meet the various circumstances. The teeth (or saw) of the saw-fish, far removed from the mouth, are designed for wounding or killing the prey. The teeth of the python are made for seizing and grasping, and are long and recurved so as to hold the prey while the gullet is worked over it. The teeth of the ray, which feeds on shell-fish, are adapted to crushing. The lion's teeth are shaped for cutting, rending and killing. His posterior teeth act as scissors. The elephant grinds his food between teeth whose roughened surfaces act like mill-stones. The teeth of the beaver are long, sharp, and chisel-shaped—requisite tools for his life's work of gnawing. The fangs or front teeth of the poisonous snake are really tubes which serve as hypodermic syringes to inject the poison. An opening at the base of the fang connects with the poison sac. Reserve fangs back of the ones in use soon replace those lost, so that removing the fangs of a poisonous snake renders him only temporarily harmless."

of the tooth, and cement, usually surrounding the base and sometimes covering part or all of the enamel of the crown. The teeth of some animals, however, the sperm-whale, for example, have no enamel whatsoever. "Teeth, according to their make-up, vary in growth. Some teeth grow for only a limited time. Others, more energetic, continue to grow throughout life. In the first case the interior

cavity occupied by the pulp fills up and growth ceases. In the latter instance the pulp cavity remains open, the tooth is continually pushed outward, and layer after layer of dentin forms at the base. The continuous growth of some teeth is illustrated in this interesting exhibit by a section of an elephant's tusk containing a wrought iron bullet. The bullet was fired into the hollow base of the young tusk, and the continual formation of dentin resulted in embedding the bullet in solid ivory.

"In man, as in most mammals, the teeth are set in distinct, separate sockets, and are separated by a membrane from the surrounding bone. But nature has other ways of implanting teeth. The extinct sea reptile known to the scientist as Ichthyosaurus had his teeth planted in a continuous shallow groove, as was the habit with certain birds which lived many centuries ago. Modern birds, however, have adopted the fashion of going toothless. Another sort of attachment of the teeth is by means of a bony union of the outer side of the teeth with the inner side of the jaw. In a fourth case the base of the tooth is

completely fused with the side of the jaw. It is another evidence of a beneficent nature that man, the only creature who is given to having his teeth extracted, does not have his teeth implanted in this last way. Some animals have the advantage of teeth which are more or less movable, due to the fact that they are attached to the jaws by ligaments. This is the case with many fishes and some reptiles. With snakes this arrangement facilitates the swallowing of the food."

The bulletin next describes the teeth of those animals that have only one set, which nature designed to last through a lifetime. Most mammals, like man, have two sets—a temporary and a permanent. No mammal has more than two. Generally a tooth is replaced by another forming below it. As the new tooth grows, the roots of the old one are absorbed until finally it falls out. Most reptiles and fishes, however, have several series of teeth, so that more or less continuous loss and replacement are provided for. The shark has several rows of teeth, one behind the other, and as fast as the teeth in the outer row are lost they are replaced by those in the rear.

Replacement may also be accomplished by the formation of a new tooth beside the old one, which is absorbed at the point of contact until the developing tooth enters the base and replaces it. That is the case with crocodiles and lizards. The teeth of the elephant are developed at the back of the jaw, and the entire row moves slowly forward, the front part of each tooth coming into use first and wearing away. While six teeth are developed on each side of either jaw, not more than parts of two teeth are in use at any one time.

"Not all animals wear their teeth in their mouths," the bulletin continues. "Some are partial to the location of their teeth on their legs, while others consider the stomach the ideal situation. And even among those animals who consider that the tooth's sphere is the mouth, there are differences of opinion as to just where teeth

## Collisions in Clouds New Peril of the Air

In ninety-nine cases out of a hundred, according to a noted aviator, a pilot only realizes he is going to crash about five seconds before the actual event.

There are three great causes of crashes—the failure of the man, the failure of the engine and the failure of the machine. The first is by far the most frequent, for the human element is always liable to add danger to the safest exploits, and in flying it often causes fatal accidents. It is not so much the physical failure of a man in a fainting fit, or a sudden attack of sickness, as error of judgment and over-confidence that so often cause disaster.

The largest number of accidents are caused in landing, as it is there that the great skill of flying lies. The pilot has to touch the ground at a speed of 40 or 50 miles an hour, and if he does not do it carefully he is liable to have a severe smash. Again, he may get off the ground and start to turn and climb at the same time, thus losing so much speed that the machine sidslips to the ground. This is one of the commonest of accidents and is very often fatal. The airman may have done this climbing turn a hundred times, but the day comes when he is over-confident or careless and does not allow himself enough speed. Less than a minute after he leaves the ground he lies in a splintered wreck of wood and wire.

Again, an airman may dive very steeply at a great speed and then carelessly pull the stick back with such a jerk that the tail breaks off, and the machine and pilot drop to the ground like a stone. That and similar accidents are cases of man failure, and happen through over-confidence and through putting too much trust in the machine.

Engine failure compels the airman to land at once. He has to choose quickly a landing ground, and it very often happens there are no flat fields within gliding distance of the machine, and so it has to be landed on bad ground and is crashed.

The nearer to the earth the machine is when the engine fails the greater is the danger, as the pilot has less choice of landing ground. If the engine stops when the machine is very low, it is possible that it will crash into a house or a tree, thus causing a fatal accident.

## The BODY'S DOUBLE in DEATH

CONAN DOYLE, the noted English writer whose remarkable revelations of psychic phenomena are startling the entire world, in a lecture on "Death and the Hereafter," said:

"The body is permeated with 'bound ether' even to the smallest tissue, and if my body disappeared, there would still remain a mold of it standing in the place of the physical body, but exactly like it. This body is indestructible. At death this etheric body—this spiritual facsimile of the other—passes over. It disengages itself until it finds itself looking at its own body.

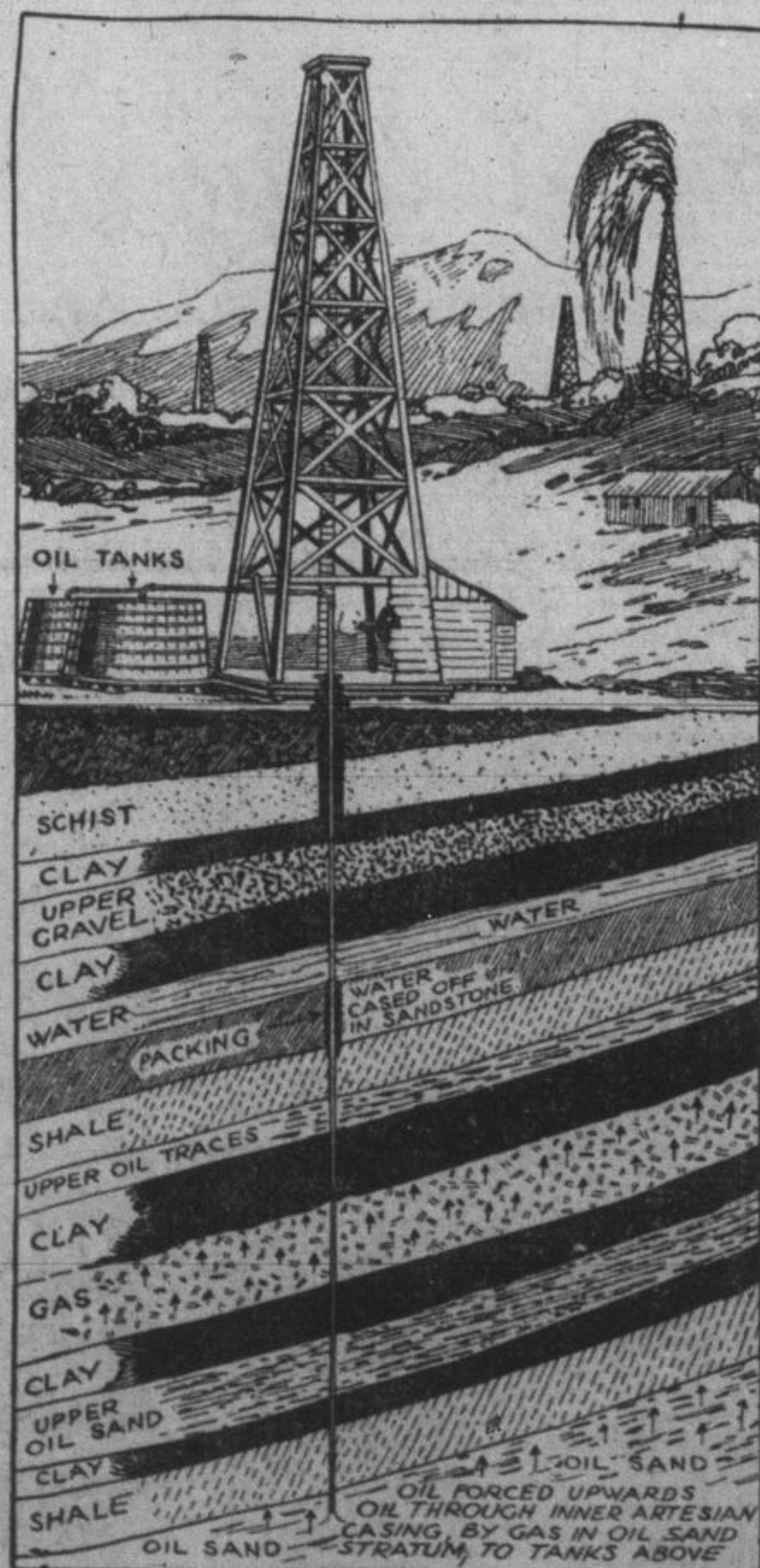
"Conditions in the other world are remarkably like our own, raised to a higher sphere, more beautiful, ethereal and infinitely more happy. It is a 'rest cure' for the trials of this life. Here man knows his worst; there man knows his best. It is a life of congenial work, which gives opportunity for the inherent capacities of man. There is family life, where only those in sympathy draw together. Spiritualists know that this is not a dream.

"The church for 50 years had talked of 'dualism' instead of being alive to the truth of Spiritualism and bringing it into their own fold. If the Established Church would accept the doctrines stated it would get fresh dynamic power which would carry on Christianity. If it does not it is doomed. Nothing can live against truth. "Christ was a psychic. He chose his disciples for their psychic power. Three of them were

always with him when he performed a miracle, as though their presence was necessary to complete a circle.

"All psychical phenomena put a terrible test on the medium and frequently mediums groaned when developing phenomena. When Christ went down to raise Lazarus from the dead, the Bible says, 'Jesus groaned.' Why did Jesus groan? It was because he was making a great effort as a psychic."

## The GREAT RIVALRY of COAL and OIL



HOW OIL IS "STRUCK"  
A Sectional View of an Oil Well, Showing the Various Layers of Strata Pierced by the Heavy Boring Tools Capable of Penetrating the Hardest Rock.

CONSIDERING the fact that oil and coal are generally looked upon as contrasting fuels, it is remarkable that the products obtained from them are so similar. In this country most coal is used in its solid form as fuel to raise heat or to obtain steam, but in other countries, and particularly in Germany, coal is distilled, so as to obtain from it a number of valuable products.

The gasoline used to propel automobiles is counterbalanced by the benzol made from coals, which also can be used for the same purpose. The paraffin oil used in lamps (or something very similar) can also be obtained from coal.

Gas oil, which is a petroleum product used for enriching coal gas, is very similar to a product that can be obtained from coal. Good fuel oil can be made both of petroleum and from coal. It is, of course, well known that the principal part of the navy's fuel oil comes from petroleum. During the last year of the war a considerable quantity of fuel oil was obtained in England from camel coal. In addition to many thousands of cubic feet of gas per ton of coal, there was obtained from this camel coal (and is still being obtained) about forty gallons per ton of excellent fuel oil. This oil, when tested under boilers for steam-raising purposes, proved very efficient, and only a technical disqualification prevented it from being used as naval fuel oil. However, when mixed with fuel oil of petroleum origin, the mixture was suitable for naval fuel.

For many years past products similar to all the principal petroleum products have been secured from a mineral known as oil-shale. From this shale is made an excellent fuel oil, good lamp oil, lubricating oils, and other liquid

products similar to those from petroleum. It is remarkable also that paraffin-wax, which constitutes the ordinary wax candles now in such general use, can be obtained from coal, from petroleum and from shale.

The distillation of coal, and the turning of it into the numerous liquid products which can be so obtained, is a far more economical manner of using coal than that of shovelling it on to fires or into furnaces, according to J. T. Smith, editor of Oil News. All-oil figures have been upset by the war and much of the data on which exact statistics can be founded are not available, but the accompanying diagram gives a rough estimate of the world's annual consumption of oil products.

The British empire's requirement of oil is large because of the enormous consumption of oil fuel by the Grand Fleet during the war. In countries like the United States and Russia, which produce enormous quantities of oil, oil fuel to a large extent takes the place of coal, and this accounts for the large consumption in those countries. America, for example, consumes at home far more oil than she exports; and, as the export trade of Russia has been practically non-existent since the outbreak of the war, all the oil produced there must be consumed or put into storage.

Boring for oil is done with "falling tools," so heavy as to pierce the hardest rock, suspended by a cable and worked by steam. The material powdered is raised by a baler, a pipe-like cylinder holding 40 or 50 gallons. It is lowered full of water, which escapes, the oil rising above it. The baler is then raised and drilling is resumed. The powdered rock mixes with the water, and the baler is again lowered to bring it up.

## UNCLE SAM'S Remarkable FOOD MAP

THERE are many kinds of maps showing many kinds of conquests; but in all the world's history there has never been another map like the one that until recently has hung in the Paris office of Herbert Hoover, director-general, American Relief Administration, in Paris, but is now transferred to the New York offices of that organization. This map represents the greatest invasion of mercy that the world has ever known and its conquest over famine. It shows the phenomenon of a great nation sending

out its man-power with no other weapons other than the hand of friendship and the tangible proof of that friendship in the form of necessities of life.

Since the beginning of the great relief work undertaken by the American Relief Administration in behalf of starving Europe, every ship going to Europe with American food has had its course marked out day by day on this map. Up to date, this map has shown the passage of 512 ships, loaded with American food for Europe.

Tiny American flags pinned to this map in all the recently liberated countries have represented the little groups of American officers and soldiers who have braved pestilence and great handicaps of transportation to penetrate into all the needy districts of Europe to distribute food.

But now, with the relief program of the American Relief Administration practically over, except special foods for children still being sent to Europe, the day of practical usefulness of this map is passed.

It remains, however, a great object of interest—an interest which will increase with the passage of years, for this map presents at a glance America's magnificent part in putting a robbed, bereaved and bewildered world back on its feet.



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