The heavy line shows progress of "gas" output, dotted line indicating probable course of curve this year. Below, in circle, is Dr. Walter

cracking process, whose outlook on gasoline question is optimistic,

n account of the Immense demand for

SUBSTITUTES FOR GASOLINE

lephol and kerosene-were discussed by

"Alcohel," he continued, "will not become

Substitutes for ganoline-length, to

Rittman, inventor of Rittman

NATIONAL PROSPERITY PROPPED BY MOTORCAR

Stable Fourth Industry Forms Big Part of Country's Financial Backbone

ZENITH NOT REACHED

The automobile, once the representative of a mushroom industry, today is regarded by bankers and business men as one of the chief props of the prosperity that will undergo a secret test in the commercial arrangle promouthly the end of the war. Not only will the motorcar industry undergo the test without detriment, in their opinion, but it will not as a great stabilizer of business. This prediction is based on the fact that the manufacture of automobiles, a \$1.50,000,000-a-year activity, ranks fourth among American industries; and, forthermore, that its foundations rest not men the shifting sands of opportunism, but emore, that its foundations rest not the shifting sands of opportunism, but saly upon a ruck—economic necessity, summary of the motorcar manufac-spoint of view runs as follows: a motorcar industry received its greatesignition in the year just closed. In may be said to have anchored itself kelly. Last year was marked by the insent of maney that theretofore had unity avoided entanglement with what viewed as an untrustworthy enter-financial backing came with a gen-

maneral backing came will a gen-ind from the great money centers munify. Leading financiers par-t in mergers and expansion, laying tone of the structure that has been building only thirteen years. MONEY BACKS INDUSTRY

definition of the state of the

profits, another all records in incombile broke all records in infrowth and established a stable
tive enterprise because it is a
Economy in transportation, both
so and recreation, follows in the
se motorcar. Excluding the citter
to littly up by the industry, the
twelf has blazed new traits, built
linked together sparsely settled
On the farm and in the city it
sel theelf firmly to American life
some a part of it.

he automobile industry. Never there been such an activity in an activity that surpassed all is. Predictions made at this time that the end of 1916 would see be foundy in the United States. estimates that every eighth an automobile. Inasmuch as own in were arrived at indepen-of one another, a mean between a apparently is a safe conclusion.

1817 TO BREAK RECORD

The automobile will continue to be in demand. Its necessity, when the end of the war will find Europe a continent depleted of horses, will be paramount in the reconstruction era of the now-warring nations. Just export sales will be no one is in

being felt, with European automobile irles taken over by their respective Gov-ents for the manufacture of war mu-as. The American motorcar maker is oving the benefit of the shortage of cars ting throughout the world. Australia, in, China, Egypt, Denmark, South rica, Holland and even little Iceland frest where American-made automo-formerly were in little demand—have a liking to the Yankee motor ve-Large numbers of them are being ted to these countries, partly on ac-of the war and partly because of the

All in all, the future, as viewed by the tomobile maker and dealer, is brighter in the luminous past.

KAURI PEAT YIELDS "GAS"

New Zealanders Find Way to Increase Supply

A new source of gasoline production has been discovered and utilized in New Zen-land and Australia, where the peat formed by prelistoric lauri trees in the swamps of these countries is transformed into gaso-A yield of six or seven gallons of

motor fuel is realized as a by-product from every ton of peat. The hardenede kauri gum or copal, a The hardenede kauri gum or copal, a resinous product of the piney tree, is too valuable to be refined for fuel, as it finds a ready market as a substitute for amber and in the making of varnishes. But vast quantities of peat are in the fossit remains and from these an oil is extracted. From twenty to thirty gallens of oil is the Average yield of each ton of peat. About twenty-five per cent of this is converted into motor fuel, the larger amount being sold at high prices to the varnish industry.

THE SCORCHER

Surry, Serry, Off with a flurry, Dodging the cable cars, Pushing his way through the thoroughfare With many a joit that jars.

Speeding,
Impeding,
Others unheading,
An oath for those who protest;
A laugh fur the pedestrian he brushes uside,
And never a thought for the rest.

Dashing, Splashing, Nothing absoling, Over streets all alippery with alime;
Then an extra spurt and a finishing jerk,
And he saves a minute of time.

Anonymous. -Anonymous

Automobile Pills A pill of "actidified gasoline" has been lavented by a New Yorker, who asserts that \$30 worth of these pills will provide motive power to take an automobile across the continuer.

Automobiling Archibald Asks:

Reliable Auto Radiator

Repairing Co. Manufacturing and Repairing of All Sheet Metal Parts for Automobiles

RADIATORS of all Descriptions Repaired and Built to Order, are tested under pressure and guaranteed water-tight

1422 Fairmount Ave., Phila.

Gasoline Outlook Good, Says Rittman

Continued from Page Two man points out that the question of meeting the demands of the motorcar mulitudes is not involuble. On the contrary he says the situation can and probably will be met in

First, By Increasing the production of gasoline from crude oil by cracking as long as the crude oil supply lasis. Second. After the crude oil supply is gone

Second. After the crude oil supply is gone (a) by cracking the oil obtained from shale, coal, peat, lignite, etc., and (b) by using alredul abtained by increasing the raising of potatoes and corn.

Cracking is a process of extracting gasoline from crude oil, a process that produces many mere times the amount of motor free than is possible by the conventional deutilation. The use of cracking, which incolves superboating the crude oil and breaking it up into the volatile compilies for the alleviation of the gasoline stringency; and to tehemista and oil producers look for the solution of the problem.

Alreads it has thrown added millions of dollars into the automobile industry. Truly.

there into the automobile industry. Truly, steems to be a failfilment of the Jesting ophicy of Lord Macaulay, who, referring the chemist of the thirteenth century.

"And soon all his hetties and griding will be turned into pure gold."

ENOUGH "GAS" FOR AUTOS Although the process is young, the effect of it on the motor fuel industry already has been so marked that the immediate future, 1917, does not contain any gasding shortage bigation. The gasciline supply for this year looks good, neording to Doctor Rittman.

Rittman.

"There are in operation today between 3,300,000 and 4,000,000 automobiles in the United States, or one for every twenty-fivour thirty persons," he said. "Machines are being made at the rate of between 7,000 and 8,000 and aday. Therefore, a total of 5,000,000 can be expected before the end of 1917. Allowing two gallons of gasoline for each of, say, 4,500,000 cars means 1,800,000,000, gallons for automobiles under exception of the property of the said of the sai card of, say, 4,500,000 cars means 1,800,000,000,000 gasilons for automobiles alone, exclusive of fractors, motorboats, farm engines, motorbycles, etc. We must produce in this country alone during this year at least 3,000,000,000 gallons of mater fuel.



"This year, according to my estimate, we all need 1,000,000,000 gallons, which is a ginerease. If one looks at a curve of isoline production he will at one realize

Ductor Rittman drew a curve, showing graphically the increase in the production of gasoline from 1909 to 1916, with the probable course of the curve this year. If his estimate is correct, the country must produce 700,000,000 more gallons of gasoline this year than last, or more than the total production eight years ago.

Is cher Bittman was asked what he thought the price would be this year.

thouser the price would be this year,

"The price of motor fuel varies widely throughout the country, differences that are absolutely unwarranted," he replied, "For instance, in December, 1916, when gasoline in Philadelphia was selling as high as twenty-five cents a gallon, in Chicago the price was seventeen and one-half cents, and in Kansas City fourteen and three-quarter cents; these differences are much greater than the freight differentials. Therefore, we have no solid basis for es-Therefore, we have no solid basis for etimates.

25-28 CENTS TO BE PRICE

"However, I expect to see gasoline find a level in the East of about twenty-five to twenty-eight cents, ranging between seventeen and thirty cents for the entire country

provided the number of automobiles does not no above the 10,000,000 mark. The cracking method of extracting gasoline from crude oil would check the price, he said, by increasing the supply.

said, by increasing the supply.

Doctor Ritiman regards the increased use of the new method as very significant. By 1920 he expects that nearly seventy-five per cent of all the gasoline on the market will be produced by cracking. The reasen is very simple: Distillation produces only ten or fifteen per cent gasoline out of the crude oil content, whereas cracking transforms fifty or seventy-five per cent of the crude oil into gasoline.

"The percentage of gasoline found in crude oil and extracted by distillation variety widely for the different oils," he said.

'High-grade castern and Oklahoma crudes

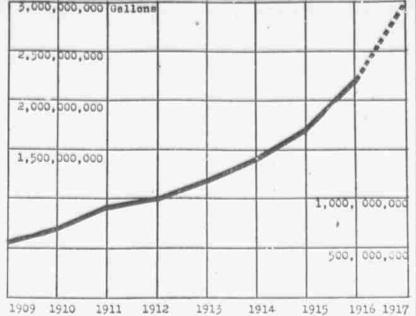
contain from twenty to thirty per cent of gasoline, white half the oil produced in California contains no gasoline whatever. Ten to fifteen per cent of the crude oil would represent a good average for the entire country's crude oil content of gaso-

CRACKING YIELDS MORE "GAS" "The percentage of gasoline extracted from the base by cracking also varies. Exaggerated claims are made by different inventors, but practice does not bear them out. A conservative estimate is fifty to seventy-five per cent of the crude oil converted into gasoline. That is more than

three times as much as the amount made by distillation." The bright future in store for cracking processes was shown by Doctor Ritman in the following table, which represents his prediction as to the growth of the crack

20 33 1-3 66.2-8 The cracking processes, in which cham

GRAPH OF GASOLINE PRODUCTION



How Chemical Engineer Views Fuel Question

GASOLINE supply for 1917 is promising. Prices should range between 17

and 30 cents a gallon for entire country; 25 to 28 cents in East. Cracking processes, whereby more gasoline is extracted from crude oil

than by distillation, are coming to rescue and dominate situation. Benozl, toluol and alcohol are practicable substitutes for gasoline. but are not in sufficient quantity now. Heavy kerosene is unsatisfac-

Supply of crude oil is at its height and geologists believe it will continue for thirty years. By increasing gasoline extraction from crude oil, country will be supplied until expected day when gasoline, failing will be supplanted by alcohol and by motor fuel taken from oils extracted from coal, peat, lignite, shale and al-

bits mee the cue for the gasoline produced differ from fractional distillation in that the latter involves the separation of the various products by the use of heat, the lighter and more volatile constituents being tile constituents, which are then dis-

HOW CHACKING WORKS

Chief among the new methods are the Rittman and the Eurton cracking processes. The Burton process is employed by the Standard Oil Company. The Atlantic Redning Company plant here uses a modification of it. The Rittman process, which has been offered free of charge by the Government to producers, was invented by Doctor Rittman while he was in the research department of the Bureau of Mines. It differs from other cracking processes. They crack the oil as a liquid, subjecting it to high heat as a liquid. The Rittman process first vaporizes the oil and cracks it as a vapor, applying high heat to the The fact that the number of plants that HOW CRACKING WORKS

The fact that the number of plants that are adopting cracking is rapidly increasing is sufficient testimony as to the value of the processes, according to Doctor Litt-

"No other method of producing gasoline is in sight now," he said, "Gasoline from natural gas supplies less than 5 per cent of the total, and will not reach more than ten per cent. Benzol and toluol from coke ovens never will be a relatively large item

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R

a factor until gasoline passes thirty-five cents a gallon. Again, to produce a suf-ficient amount of alcohol for motor fuel a big part of the United States would have to be given over to the raising of corn and potators. I doubt if we will see heavy kereicene used coreniavely, because it is difficult to get prosper explosive mixtures with air. The lighter heresenes today are noticed with gasoline for the market."

EFFICIENT METHODS NECESSARY

REFECIENT METHODS NECKSSARY

Judge Editions combatically expressed
the opinion that efficient, practicable methods of converting the available supply of
cride all this disselline were all-important.
The simply is not evertainties.
"Geologists seem to agree that we are
today at the reak production of cride oil,"
for will. "That is, for years house our words
production will not be materially greater
than it is today. Geologists see thirty
years' supply of cride. Dur way out is rul
in the terresol cride shipily foll by using
more efficiently the present cride profiletion.

When this summly is exhausted we shall When the summy is extended we shall turn to shale and, peak, lightle, etc. We shall extract in from these and crack the aid. The obtains oil supply through these uniterists is greater than our visible crade oil supply. We must develop cheap and efficient methods for proceeding the oil contained in these materials.

"Veshall too, would become at once transcolounly important of the origin of supply stable in a says at the origin of supply stable in the says at the origin of supply stable in a says at the origin of supply stable in a says at the origin of supply stable in a says at the origin of supply stable in a says at the origin of supply stable in a says at the origin of supply stable in a says at the origin of supply stable in a says at the origin of supply stable in the origin or supply stable in the origin of supply stab

other there is a way out of the as printen. We must crack while to of supply facts. After that is must use abstant, and, when us off from the vect storedouse of end and its allied materials, we must crack that. Just as the closuist came to the front stat raised the day when the crude oil simily fathered as Dactor Hittman expects the chemist to device a means of meeting the situation squaredy when the supply vanishes it a up to the chemist.

THREE KINDS OF "GAS"

Straight, Blended and Cracked Gasoline Defined by U. S. Government

Gasolino sold in the United States is di-

They are: Eirsti straight refinery gase tine for special purposes, such as aeroplan-use; second, blended casinghead gasoline for use in motocars about two years old, and three cracked and blended gasoline for up-besture cars that can efficiently use the heavier fiel.

32 MILES A "GAS" GALLON

Professor's Car Uses That at Fifteen-Mile Gait

Honestly, how much "gas" a mile do urfily practicable, but their use depends utirely upon the cost and quantity avail-ble. he sail, The mount of crude edged and folial made yearly now is a inted States. With the new overs being until mixed States. With the new overs being violerneted it will become more than \$6,000,000 gallons. But these amounts are not sufficient to make these predicts factors in the motor fuel situation, where we figure it terms of billions of gallons instead of sulliness. titute, reported the following results

abled him to perform this feat



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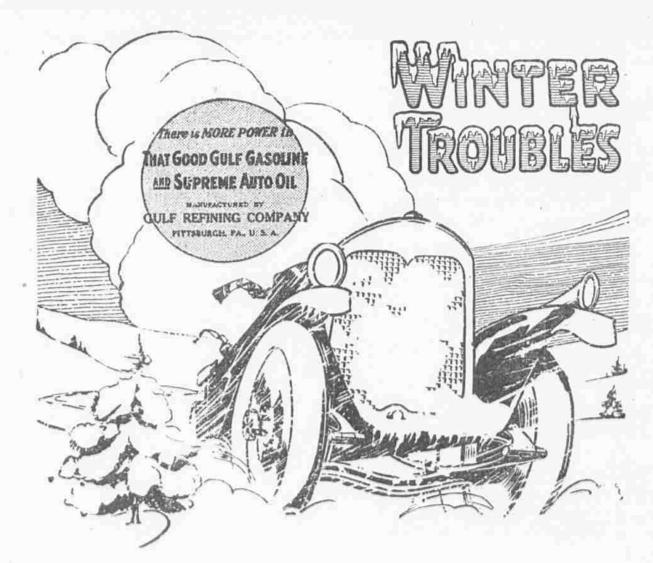
to an extent that will command the attention of all who are interested in Automobile Sales and Service. We do not believe there has ever been shown in one exhibit as complete and comprehensive a line of Garage Appliances as we present at our booths this week.

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