

Vegetables Next Oil Source?

By JEAN ARNOUX
in La Science et La Vie, Paris

The problem of the gradual exhaustion of the world's petroleum supply has stimulated research on synthetic carburants. Pure alcohol occupies the first place on the list of such carburants, but even if it were to become the carburant of the future, only the problem of light oils would be solved. What is needed is a synthetic petroleum that would combine all the elements of the natural product.

There are two hypotheses on the origin of petroleum: the organic and inorganic. They suggest two methods of production of synthetic petroleum. The inorganic origin, that is, the formation of petroleum from mineral substances, is accepted by such eminent scientists as Berthelot, Moissan, Sabatier and others. From acetylene, produced synthetically through the combination of carbon and hydrogen in the electric arc, it is possible to obtain, by means of condensation, a synthetic petrol and substances analogous to toluene and xylene, which are at the basis of California petroleum.

According to the other hypothesis petroleum is the product of a process of dry distillation which animal and vegetable substances undergo under high pressure and under the influence of the heat of the earth. By distilling whale oil it is possible to obtain a product analogous to the natural petroleum of the American East. This was the origin of research on the action of distillations on all sorts of fats.

Fats, especially vegetable oils, are a combination of an alcohol with glycerine and a fatty acid, like stearic or oleic acid, the molecules of which are rich in atoms of carbon. If glycerine is subject to the action of a fat acid, it decomposes into water and fat; this process is called saponification. The inverse reaction, that is, the action of water or an alkali on fat, is called saponification.

The chemical composition of vegetable and animal oils being essentially the same, the results obtained with whale oil should be obtainable also from vegetable oils. Professor Mailhe of the Sorbonne has proved that by distilling oil at a high temperature (1112 deg.), one can obtain water, gases, liquid products and acrolein, which is the result of the destruction of glycerine. The gases burn with an illuminating flame and have a very high calorific power, due to their considerable contents in substances analogous to methane and ethane.

The condensed liquid consists of carbohydrates and is perfectly utilizable as a fuel for explosion motors. Its chemical composition is identical with that of the natural Rumanian or Californian petroleum. Only the problem of synthetic heavy oils remains therefore unsolved. Mailhe has proved that, upon addition of chloride of zinc, the oils distilled according to the above process, yield after a few hours more distillation at high temperature a heavy liquid identical with heavy mineral oil, and a viscous substance, which is nothing else than vaseline.

We are therefore justified in saying that the synthesis of petroleum has been discovered. The technique has undergone several slight modifications and is still being improved, because it is desirable to obtain a complete synthetic petroleum right from the start, without having to subject the oils to two processes. It is also important to devise some means by which the destruction of the very valuable glycerine could be prevented. Both can be achieved through the use of suitable catalysts. From an economic viewpoint a ton of oil yields 100 kg. glycerine and 900 kg. fatty acid, from which 630 kg. petrol can be derived.

The problem of the utilization of vegetable oils in combustion motors is therefore not insoluble. Even now they could be used successfully instead of mineral oils for Diesel engines. They even present advantages over mineral oils, inasmuch as they offer greater security against explosions.

Castor oil is at present the only lubricant used for airplane and other high speed engines, because it retains its fluidity well and is very little influenced by temperature. Moreover, its combustion leaves less solid residue than that of mineral lubricants. Besides, the quality of a vegetable oil is subject to modifications through a careful selection of the oleaginous plants. The only inconvenience of castor oil is that it turns sour very quickly, whereas mineral oils are inalterable, but it is hoped that this defect can be eliminated through improved refining.

The adoption of vegetable instead of mineral oils as lubricants for explosion motors presents many advantages. Their viscosity is almost inalterable, contrary to mineral oils. Like castor oil, all other vegetable oils leave very little residue after combustion. This is probably due to the fact that the molecules of vegetable fats are rich in oxygen. The use of vegetable oils on a large scale is equivalent to the best possible utilization of solar energy.

25 lbs. OF FAT GONE

Rheumatism Went With It

A threefold benefit came to this woman when she lost unwanted fat. Up to a few months ago I was always troubled with rheumatism. My joints were getting so swollen it was misery to walk. I was then 155 lbs., which is a great deal, seeing I am only 5 ft. 2 inches in height. I thought I would try Kruschen, although I did not then believe it would reduce weight, but I thought it would perhaps ease the pain. I took half-a-teaspoonful in a tumbler of hot water each morning, and to my great delight I started to lose weight, also pain. This week I was weighed and was 130 lbs., which I think is proof positive. My friends are all asking me what I am doing to lose weight, so it is very noticeable. Also I look and feel a lot better in health.—Mrs. M. H.

The six salts in Kruschen assist the internal organs to throw off each day the waste and poisons that encumber the system. They, little by little, that ugly fat goes—slowly, yes—but surely. The pains of rheumatism and neuritis cease. You feel wonderfully healthy, youthful and energetic—more so than ever before in your life!

—Burke.

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Instead of having an acid stomach and being constipated, Mr. Frank C. is well. "I can eat anything since trying Carter's Little Liver Pills," he says. Because they are PURELY VEGETABLE, a gentle, effective tonic to both liver and bowels, Dr. Carter's Little Liver Pills are without equal for correcting Constipation, Bilioussness, Headaches, Poor Complexion and Indigestion. 25c. & 75c. red pkgs., everywhere. Ask for Carter's by NAME.

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Healthy complexions come from healthy systems. Free the body of poisons with Feen-a-mint. Effective in smaller doses. All druggists sell this safe, scientific laxative.

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RESTFUL SLEEP for FRETFUL, FEVERISH CHILD

With Castoria's regulation

When your child tosses and cries out in his sleep, it means he is not comfortable. Very often the trouble is that poisonous waste matter is not being carried off as it should be. Bowels need help—mild, gentle help—but effective. Just the kind Castoria gives. Castoria is a pure vegetable preparation made especially for children's ailments. It contains no harsh, harmful drugs, no narcotics. Don't let your child's rest—and your own—be interrupted. A prompt dose of Castoria will urge stubborn little bowels to act. Then relaxed comfort and restful sleep! Genuine Castoria always has the name:

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Huge Study Centre Opens in Germany

International Exchange for Educators Takes Over an Old Citadel in Mainz

New York.—Among the many important developments in the field of international education the opening of the Institute of International Education this Spring at Mainz, Germany, is of particular significance, according to Professor T. Alexander of Columbia University.

Housed in the citadel lying above the city, the institute has objectives far different from those which the military background of the scene would lead one to expect. For centuries the currents of civilization have moved up and down the Rhine Valley under the battlements of this historic stronghold.

This new institution promises to become an invaluable source of information and place of study for educators throughout the world, and it should become, if the hopes for it are realized, a centre for the exchange of ideas and experiences of the leaders in thought of all nations.

The chief purpose is to provide in the several hundred rooms at the disposal of the institute a centre for the study of international and comparative education. This will be accomplished by establishing an educational museum and library in which will be gathered exhibits of school and school life and educational literature from all leading nations of the earth. Here will come professors and students to live and study independently or in groups without the interference of the usual university machinery, restrictions and regulations.

Expenses Kept Small

In order to provide these facilities, living accommodations have been arranged at the institute where a professor who wishes to carry on a piece of investigation may receive board and lodging over a period of months or even a few days, or students may come singly or in groups and pursue their educational investigations and observations. The expense has been reduced to a minimum. It is possible to get full board and lodging at the hostelry of the institute for as little as \$1 a day.

The location of the Institute at Mainz is fortunate from the point of view of accessibility to centres of culture in Europe, especially in Germany, France and Switzerland. This is particularly true with reference to opportunities to observe at first hand some of the outstanding educational systems and institutions of these countries. Within a ride of an hour or so one may reach Heidelberg, Frankfurt, Glessen, Marburg, Cologne, Coblenz, Wiesbaden, Mannheim and Darmstadt, all of which possess outstanding institutions, such as universities and technical institutions and museums, and each of which furnishes fine libraries and progressive modern educational systems.

Seminars and conferences will be organized under the auspices of the institute, to which foreign groups will be invited and at which international problems will be exchanged. For example, this Summer from July 20 to 26, two international meetings will be held at Mainz—the first a symposium on American education for the benefit of German teachers and educators organized by the writer, and others will come to address educators in Central Europe on the organization and procedures in education in the United States.

Immediately following this conference there will be a seminar on the political and social changes affecting education, to be conducted by the institute for the benefit of visitors from all over the world who are en route to attend the New Education Fellowship Conference at Nice, to be held from July 29 to Aug. 12.

Aids For Students

Among its services the Institute foresees providing visitors from foreign lands with expert advice and guidance with reference to educational systems and schools which foreigners may wish to visit for the purpose of studying European schools at first hand. This service will include not only advice about which schools to visit, but the provision of letters of introduction and entree, which will facilitate the work and save time. Those who have visited schools in foreign countries know how important it is to spend the time in the schools rather than in seeking admission to them.

One of the most interesting features will be the vast educational museum. Every phase of schools, for example, will be illustrated by means of a well-organized exhibit showing the organization, buildings, administration, equipment, text books, methods of instruction, training of teachers, and so on.

A Vast Exhibition
This year every sort of illustrative material is being collected in order to objectify the school systems of the leading countries. Forty-five rooms of the historic fortress, high above the city where Gutenberg invented the art of printing, are devoted to an impressive survey of German schools. Two separate buildings contain models and architects' designs of modern school-houses, school furniture, and the like, and in another of the time-hallowed buildings is an equally extensive exhibit of modern school-room equip-

"Winning" Smile



Alice Cash sure cashed in on her smile. This young Californian miss entered against 15,000 others in a smile contest. "Radioman" Weiss of KFI congratulates Miss Cash on winning the dough.

Growing Girls!

Profit by the Experience of Others at This Vital Time

When I was 16 I was so ill my people thought I was going to die. I writes Mrs. Annie Wilson, S. U. S. E. X. Ave., Toronto. "I had scarcely any blood, and was so weak I could hardly walk. Had no appetite and I lost ground every day for a long time, until a friend recommended Dr. Williams' Pink Pills. I got them, and before I had finished the first box I was feeling much better. I continued taking the Pills until I was completely well. I went to all the dances and had the time of my life again. I certainly recommend Dr. Williams' Pink Pills to any one who is anaemic or run-down in any way, for they certainly rebuilt my health."

Don't let anaemia rob your growing daughter of health and vigor. Give her Dr. Williams' Pink Pills. They banish the condition by creating new blood which imparts health, vigor and vitality. Equally good for all run-down or nervous conditions. At your druggist's. 50c a package.

Gems from Life's Scrap-book
LOVE
"The heart of him who truly loves is a paradise on earth; he has God in himself, for God is love."—Lemmenais.

"To love is everything: love is God."—Leon Gozlan.

"To love is to believe, to hope, to know; 'Tis an essay, a taste of heaven below."—Edmund Walker.

"The religion of humanity is love."—Mazzini.

"Love is the liberator."—Mary Baker Eddy.

Remember—The gentle Quaker, Elizabeth Fry, pioneer of prison reform, was loving.

YOUTH
Youth is a call that frees the heart. And youth is morningtide; Youth is the caravan that breathes With zest the steep hillside.

Age is a sword put up again. After the day-long light; Age is a journey ending, and A quiet inn at night.—Marjorie Wilson.

"Waiter, there were five matchsticks on the plate with my meat." "That was the asparagus, sir."

Teething
"Baby's Own Tablets take away that teething fever," writes Mrs. Alfred Bungay, North Sydney, N.S. Effective also in relieving colds, fever, colic, upset stomach, constipation. Children like them. Absolutely SAFE.—See analyst's certificate in each 25c package. 231 Dr. Williams' BABY'S OWN TABLETS

Upward Smart Bon Mot
Dr. Nicholas Murray Butler is responsible for one of the smartest bon mots in many a moon: "I divide the world in three classes—the few who make things happen, the many who watch things happen, and the overwhelming majority who have no notion of what happens."—London Free Press.

Red Rose Tea

at reduced prices

Red Label, 25¢ 1/2 lb.

Orange Pekoe, 38¢ 1/2 lb.

Recreation

By Viscount Grey of Fallodon
It is sometimes said that this is a pleasure-seeking age or not, I doubt whether it is a pleasure-seeking age. We are supposed to have great advantages in many ways over our predecessors. There are supposed to be more opportunities for enjoyment: there are moving pictures, motor-cars, and many other things which are now considered means of enjoyment and which our ancestors did not possess, but I do not judge from what I read in the newspapers that there is more content.

Indeed, we seem to be living in an age of discontent. It seems to be rather on the increase than otherwise and is a subject of general complaint. If so it is worth while considering what it is that makes people happy, what they can do to make themselves happy, and it is from that point of view that I wish to speak on recreation.

Let it be admitted that recreation is only one of the things that make for happiness in life. I do not even recommend it as the most important. There are at least four other things which are more or less under our own control and which are essential to happiness. The first is some moral standard by which to guide our actions. The second is some satisfactory home life in the form of good relations with family or friends. The third is some form of work which justifies our existence to our own country and makes us good citizens. The fourth thing is some degree of leisure an dthe use of it some way that makes us happy.

To succeed in making a good use of our leisure will not compensate for failure in any one of the other three things to which I have referred, but a reasonable amount of leisure and a good use of it is an important contribution to a happy life.

Books are the greatest and the most satisfactory of recreations. I mean the use of books for pleasure. Without books, without having acquired the power of reading for pleasure, none of us can be independent, but if we can read we have a sure defence against boredom in solitude. If we have not that defence, we are dependent on the charity of family friends, or even of strangers, to save us from boredom; but if we can find delight in reading, even a long railway journey alone ceases to be tedious, and long winter evenings to ourselves are an inexhaustible opportunity for pleasure.

Recreation—Riverside Press—Houghton Mifflin Co.

Only One Mother
Hundreds of stars in the pretty sky;
Hundreds of shells on the shore to gether;
Hundreds of birds that go singing by;
Hundreds of flowers in the sunny weather.

Hundreds of dewdrops to greet the dawn;
Hundreds of butterflies on the lawn;
But only one Mother the wide world over.—George Cooper.

UNDERSTANDING.
To understand everything would be to pardon everything.—Madame de Staël.

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