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What this Changing World Means to You

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How to Tell Adulterated Coffee

SIMPLE tests for telling whether coffee has been adulterated are given by C. E. Shepard, chemist of the Connecticut Agricultural Experiment Station.

Examination of coffee samples recently submitted to the station showed one of them to be almost 50% adulterated. A flat taste or lack of kick may be, as coffee drinkers often suspect, signs of adulteration.

Chicory is the most common adulterant of coffee, Mr. Shepard stated. One test for detecting chicory in ground coffee is made by placing a good pinch of the material on a piece of white paper. Examine the individual particles with a hand lens, though you can tell the difference between coffee and chicory without this aid. Coffee grounds are usually light brown and granular, while those of Chicory, being made from a root, are fibrous and darker in color.

The "water test" shows up the difference even more distinctly. Half a teaspoonful of coffee is placed in a glass a quarter full of water. Most of the true coffee will stay on top for a time, but grains of chicory or other fibrous vegetable material quickly become water-logged and sink, often coloring the water brownish.

After allowing the material to soak for ten minutes, the water is drained off, and the grains spread out in a dish or on a piece of white paper. If, on prodding with a match stick or tweezers, a granule appears hard and resistant and "jumps away," it most likely is coffee. But if it is almost like gelatin in consistency, it is a foreign substance, probably chicory.—*Science News Letter*.



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SCIENCE DIGEST

WHAT THIS CHANGING WORLD MEANS TO YOU

Volume 13 . . . Number 2

When Peace Comes to America

Condensed from two chapters of *Goals for America: A Budget of Our Needs and Resources**

Stuart Chase

SOME DAY the bombers will be grounded, the bugles will sound, and the war will end. If the end comes within the next three or four years, the physical picture of the American economy promises to look something like this:

A vast force of trained workers in the war industries to be demobilized and shifted to peacetime occupations. They may be expected to insist vigorously on re-employment.

An industrial plant greatly expanded, especially for the production of machinery and such materials as light metals, rubber, other synthetics and plastics.

Machine tools—the machines which make machines—in great profusion.

An agricultural plant specializing in crops of high nutritional

value, and capable of supplying far more than our own population.

A very great increase in electrical energy.

A vast budget of postponed wants to be filled—houses, clothing, automobiles, tires, radios, washing machines, durable consumer goods of all kinds. Incidentally, many consumers will have stored up purchasing power with which to buy them.

An insistent call from abroad for American food, supplies and industrial equipment.

An imperative demand for public works neglected during the war—conservation, hospitals, highways, schools, water systems, sewer systems, irrigation, transport facilities, and the like.

A promise of freedom from want to be redeemed.

Americans will find themselves with plenty of tasks to do. They

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will have the trained man power, the plant, the energy, the raw materials, the machine tools, to do it with. Failing a very long war which erodes away much of the plant, the outlook in physical terms is encouraging.

There should be no material reason for not carrying American civilization forward, as well as supplying many victims of the war beyond our borders. We shall be physically equipped to do both of these.

Shall we be mentally prepared? Are we going to be flexible enough as a people to adjust our concepts so that these strong physical elements can be fully used? Will the war educate us to put first things first? Or shall we close our eyes to the physical realities as we did in the years after the panic of 1929? . . . That was a strange business—a horrible example of what not to do when and if a postwar depression threatens.

Our economic system for decades before 1929 had been operated on certain traditional customs, concepts and rules concerning markets, prices, debts, credit and money. The rules and concepts said that unless people had money they could not eat; if sales fell off severely workers would have to be discharged; if crops could not be sold farmers would have to destroy them; if rentals were not paid tenants would have to be evicted.

Each citizen did what he could under these traditions. Very few citizens felt that they should be

changed—at least not for the first year or two. Later on came many plans to make new patterns, some of them, like Technocracy and Social Credit, very unorthodox indeed.

The economic system was supposed to be self-regulating, and it was considered "unsound" to monkey with the mechanism. When Mr. Hoover was first importuned to do something drastic about the crisis he said that "economic wounds must be healed by the action of the economic body—the producers and consumers themselves."

Under the rules and customs nobody could do anything about unemployment and starvation except in the most trivial way. Businessmen could do nothing about it, for as their sales and prices declined they had to dismiss their help or go bankrupt. Farmers could do nothing about it, for they had no money and no facilities to take their crops to market gratis. Investors could do nothing about it, for they could hardly launch new enterprises when the chimneys of most of their existing enterprises were cold. Labor unions could do nothing about it, for they had no plants of their own in which their members could work.

Government leaders felt they could do nothing about it, for tax receipts were falling, making the budget harder to balance as it was, let alone spending to increase work.

So it was all reasonable according to the ideas in people's heads, and quite senseless according to the laws of community survival in the physical world.

Mr. Hoover was big enough finally to break some rules. He violated the sanctity of the balanced budget; he put relief on a federal basis, and he organized the Reconstruction Finance Corporation to bolster failing banks, railroads and insurance companies.

Mr. Roosevelt broke a lot more traditions. He abandoned the gold standard, pegged foreign exchanges, deliberately embarked on deficit spending for public works, took farmers out of the free market with the AAA, insured bank depositors against loss, and advanced government credit to citizens so that they would not be evicted from their homes.

Mr. Hoover recognized that somebody had to be responsible for the welfare of the American community as a whole. He was our first national planner in times of peace. The planning was neither extensive nor effective, but a new principle had been laid down.

Mr. Roosevelt carried the principle much further. He did not cure unemployment, but his planning at least checked the downswing, and mitigated some of its most disastrous effects.

Unemployment is the cancer of high-energy societies. In handicraft societies it is practically unknown. It is one of a very few hardships which people will not stand indefinitely.

An economic system which leads to chronic unemployment, therefore, cannot last indefinitely. This senseless performance, of walking

away from our places of work to rot in bread lines and on relief rolls, must not happen again.

If we cannot make changes in our system in a democratic manner so that it does not happen again, a man on horseback will surely try to make them for us, perhaps with considerable mass approval. Hitler seized the government of Germany when unemployment reached one man out of three.

After the war the first charge on the total output of goods and services should be basic necessities for all citizens.

The second charge should be such mass comforts as are capable of quantity production. Prewar industry, for instance, could readily supply every family with a car, a radio, and plenty of trips to the movies. In this country it very nearly succeeded.

Many mass comforts are now in the class of necessities. They are the items which vary with population rather than with income.

The third charge might well be the construction and maintenance of those enduring works which all the people need and which may symbolize a great culture. The citizen of Athens saw the Acropolis and his spirit was lifted up. He was proud to be a member of a community which could produce such a just and lovely thing.

No civilization can be reared without great public architecture to dramatize its greatness to its people. In the Tennessee Valley we are evolving an architecture to fit

widely used chemicals, were discovered to be very different from the previous conceptions.

The latest electron microscope addition is a scanning device that may make it possible to send electron microscope pictures by television in the future. But that is not its present utilization.

The scanning electron microscope, combining the electron scope, television, and radio facsimile, permits the study of the grain structure of opaque objects, such as metals, to an order of minute detail never before realized.

The electron microscope can also be used to peer into the interior of minute objects and determine their molecular structure. In this modification the photograph obtained is not a picture of what the material would look like if we could see such minute objects, but it is a diffraction pattern which allows the physicist to tell how the atoms are arranged in the molecules. Within a few minutes of each other a picture and a diffraction pattern of the same specimen can be made, which is a great advantage in many fields of research.

Another improvement on the electron microscope is the production of stereoscopic pictures so that objects can be "seen" with a three-dimensional effect. The trick is to make two pictures from slightly different angles, and these twin pictures can be viewed through a stereoscope, like the parlor diversion of our great-grandmothers' time.

In a very different way, electrons of extraordinary speed and energy are being used in the world's most powerful X-ray machines. A special machine called the induced electron accelerator whirls electrons to such high speed that a machine actually in operation produces X-rays of 20 million volts while a new machine is designed for 100 million volt X-rays.

A massive concrete building with walls 3 feet thick is necessary to house this powerful machine with safety. It will be used to test armor plate, but the fact that 100 million volt X-rays have the wave length of the weaker cosmic rays causes the speculation that something new about the structure of the universe may be discovered when scientists have had the opportunity of working with such powerful radiation.

Hidden behind the cloak of secrecy that surrounds military research is any progress that is being made on the extraction of power from within the uranium atom through splitting it asunder. From the heavens comes evidence that atomic fission similar to that of uranium 235, on which hopes of atomic power on this earth are based, takes place in the sun's corona, that system of luminous streamers which surrounds the sun and is visible only at a total solar eclipse.

The extraction from the sea of magnesium metal, lighter in weight than aluminum and useful in airplane production, is one of chemistry's major achievements and aids