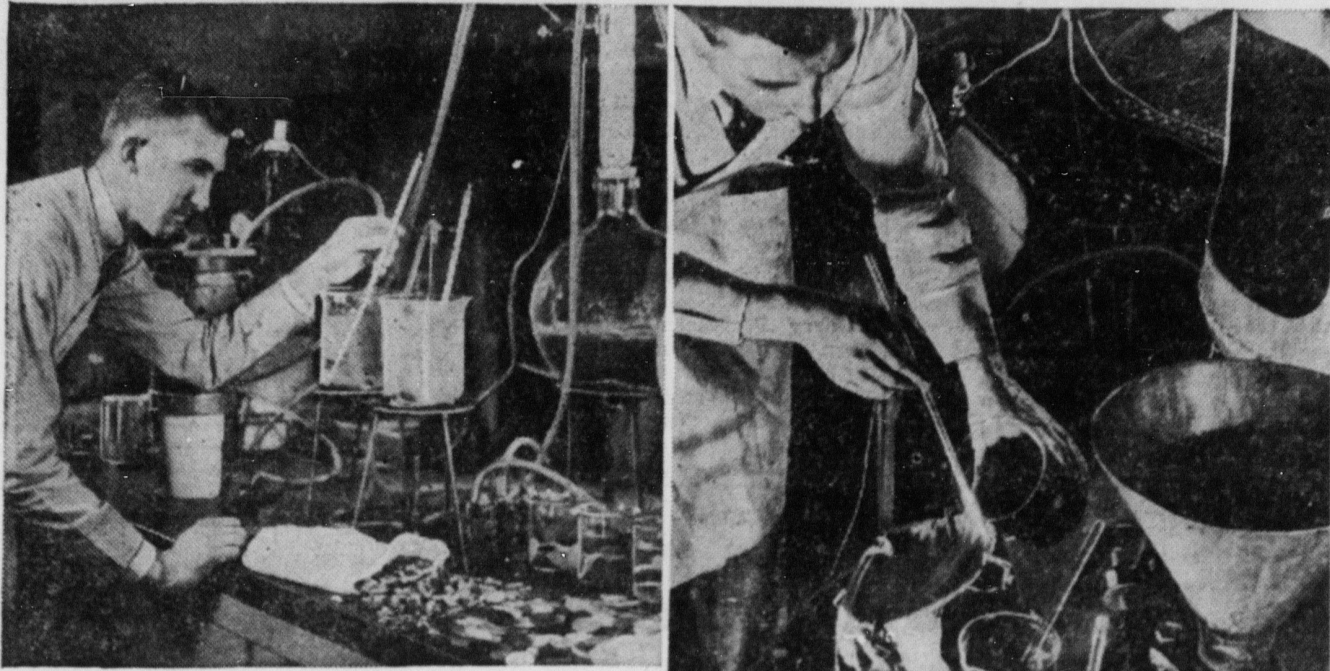


GEMS MADE FROM CARBOLIC ACID

Country Newspaper Editor's Discovery Led to Huge Industry, Affecting Every Walk of Life in "the Plastic Age."



By WILLIAM C. UTLEY

COUNTRY newspaper editors have exerted upon American life an influence which is perhaps second to that of no other group of men. But one country editor little dreamed 65 years ago that he had started something destined to become a new and amazingly common factor in the daily life of virtually all Americans—indeed, in the lives of persons in every corner of the world. He simply believed he had failed to win \$10,000.

Now country newspaper editors are not wealthy as a rule, and John Wesley Hyatt, editor and printer of Starkey, N. Y., was no exception. He had ideas, though. And when a billiard ball manufacturer, discouraged by the expense of stalking African pachyderms for the raw material of which his product was made, offered \$10,000 for a synthetic ivory substitute, Hyatt began some serious tinkering with test tubes, retorts and a Bunsen burner in the back of his shop.

Somehow, between type cases, an old Washington hand press and his laboratory, Editor Hyatt managed to keep from getting highly explosive gun cotton mixed up with the local items and the legal notices, and conducted exhaustive experiments. From this gun cotton (nitrocellulose) he failed to produce synthetic ivory, and of course he missed out on the \$10,000 prize. But he did stumble upon something of far vaster importance to the human race than all the ivory in the world—he found the formula for celluloid.

Celluloid was the first commercially usable plastic; it opened the pages of history to what we now think of as "the plastic age." They make billiard balls, jewelry and a few fancy doo-dads out of ivory, and they still do. But today, through the magic of modern chemistry, more than 300,000 articles in general use are manufactured by the men who pioneered in plastics.

What Plastics Are.

The end is nowhere in sight; in fact the plastics industry is still in its swaddling clothes. But the effect it will have upon society in the days to come is not going without recognition. The national resources committee, in its much-publicized report to the President, recommending social planning for the development of new inventions and young industries, named plastics with television, airplanes, the mechanical cotton-picker and other innovations, as one of the inventions most likely to have profound effect upon our society of the next fifteen years. Yet you cannot find one person in fifty who can tell you much about how plastics are made, or one person in ten who can even tell you what they are.

Actually, a plastic is anything that can be molded or pressed into a desired shape. In industry the term applies to a wide range of synthetic materials classified according to their chemical nature and the way they are made. The most important classification in industry—and in our daily life—is phenolic resin. The utility of this plastic was accidentally discovered; in fact fortunate accidents were largely responsible for "the plastic age."

Ten years after Editor Hyatt stumbled upon celluloid, the material was in general use; 10,000 highly diversified articles were made from it, the most famed probably being the old celluloid collar that reached popularity in the days of handlebar moustaches.

Catalin Was a War Baby.

Next in the succession of plastic accidents was the discovery made by Dr. Leo Baekeland, Belgian-American scientist, forty years after the Hyatt incident. Experimenting in his laboratory at Yonkers, N. Y., Dr. Baekeland was searching for a highly insulating material much in demand by the electrical industry. He inadvertently hit upon the formula for a cast phenolic resin which was non-inflammable. This was highly important. Any

one who can remember back three decades can recall when "the best dressed man in town" had to be mighty careful with his cigar because his celluloid collar, which could be wiped off with a damp cloth, could also be touched off by a tiny spark, leaving him a bit hot under the collar. The inflammability of celluloid and the consequent hazard of storing it had precluded the extension of its use, but the discovery of the new non-inflammable material gave impetus to the broadening use of plastics.

The World war set the stage for the third and most recent important development in the world of plastics. European Entente chemists worked feverishly trying to create a synthetic rubber from phenol (the carbolic acid derivative of coal) and formaldehyde (a gaseous derivative of wood alcohol captivated in water).

Desperate they were, these researchers. With their ports blockaded and supplies cut off, the Entente nations needed raw materials. Rubber was sorely needed to soften the screech of iron-tired wheels of military equipment, which creaked and rattled, indicating their positions to the enemy just as definitely as if they had shouted, "Here we are." Gas masks, footgear and other articles required the precious rubber.

Synthetic rubber eluded them. But the German scientists did discover catalin, a material similar to that discovered by Dr. Baekeland, and made from the same ingredients, but so processed that it would be produced in a new aurora of color ranging from water-clear white, resembling glass, to delicate pastels, vivid hues, black, white, ivory and many combinations of colors definitely divided or blended by mottling.

The Germans had too much other business on hand to spend a great deal of time in the development of catalin, so the formula, patent rights and manufacturing privileges were bought by Americans.

Industry Still in Infancy.

Three important plastics had now been introduced to American industry. It was not long before 3,000 manufacturers, many of whose wheels had been idle, learned that they could make many salable items from plastic materials, using the same machinery which had formerly been used in tooling wood or soft metals and with the same craftsmen and technique. A shining example is a Canadian firm which made spools for thread. Its community depended upon the employment it offered for a living; yet its market had fallen to nearly nothing. The plant turned to the manufacture of catalin articles and now, with the same equipment and craftsmen, it produces buttons, jewelry and scores of other items that amaze the public with their brilliant beauty.

The flood of plastic articles to the market has in a few years altered fashion trends in costume jewelry, made insignificant accessories an important part in the fashion picture, created thousands of new versions of useful articles—and the President's natural resources committee warns that the industry is only in its infancy, that society will have to plan to adjust itself to its development. Thus is the magnitude of this "plastic age" being recognized by men who contemplate our future!

How do the 300,000 articles now made from catalin and other plastics affect our daily lives? We start the day with a plastic-handled tooth brush, razor and comb. At the breakfast table we may find knives, forks and spoons with colorful handles of catalin—the insulating handles of the toaster and percolator are of the same material. The kitchen electric service comes

through a plastic switch, plate and fittings, and in all probability serves a table lamp with a plastic shade. (For lamp shades are now being made of paper, glazed with liquid phenolic resin, as the most commonly used plastic is called, commercially. Dials for clocks, radios and speedometers are similarly treated, providing an attractive, efficient and economical substitute for previous processes.)

This is just a fair morning start. Driving to business, we use a plastic steering wheel, gear shift lever handle and all sorts of gadgets on the instrument panel. At the office the telephone instrument is made of plastic, and it is an "odds-on" bet that so are the inkwell, pen and ashtray on the desk. Veneer surface woods in the furniture are cemented in place with a liquid plastic adhesive.

How Catalin Is Made.

Almost no matter what you do, you encounter plastic products. Colorful wall panels in modern theaters, dwellings and ocean liners are made of them. So are jewelry, toilet articles, cosmetic containers, buckles, umbrella handles, bag and golf club fittings and game fish lures. Even "store teeth" are made of plastics, as are the dental plates to which they are affixed. For those who like to quaff the flowing bowl, the advent of catalin dental plates was a welcome boon, for the old type plates were deteriorated by alcohol, while catalin is not. But dentistry is only one of the numerous professional fields in which plastics has left an indelible mark. You can turn into almost any other line of endeavor and there it is—plastics, making important new strides.

Catalin is made by mixing formaldehyde and phenol in nickel-lined kettles of approximately 3,000 pounds capacity. The weight is reduced to about 1,500 pounds by the time the first production phase is complete. The mixture is cooked at a low temperature. Heat is produced by the reaction of the two ingredients and held down to an even temperature by the use of water, vacuum or steam in an outside jacket. At this stage the color is added.

Here catalin has the consistency of molasses, and is poured into lead molds to form the shapes required by the fabricators. Two or three color combinations may be cast at a single pouring, the mold leading the different colors into their proper places. Catalin is also poured into pans and when semicured (heated until it becomes gelatinous) is sliced into required thicknesses.

Magnificent Future Seen.

In the curing ovens, the even, moderate temperature of which would permit a man's walking around in them, catalin is completed by curing for about 50 hours. It is then ready for delivery to the fabricator, who cuts it, lathes it, buffs it and otherwise works it into the finished product which he sells.

So great has been the public curiosity about plastics, especially since the national resources committee's report, that one of the leading moving picture producers in Hollywood has filmed the manufacture of multi-colored catalin in full colors. The picture was scheduled for release in 8,000 theaters in October.

What of the future? The almost utter lack of limitations in the field for cast resins defies description. Because of its beauty, its low cost, its extreme "workability," and its many peculiar characteristics it is the stuff for pioneers in almost every branch of industry.

Country newspaper editor John Wesley Hyatt really started something when he began dabbling outside his chosen field 65 years ago.

Ask Me? Another

A Quiz With Answers Offering Information on Various Subjects

1. How much wood will a giant Sequoia tree yield?
2. How many persons out of a million will live to be one hundred years old?
3. Who was the first American to receive the Nobel prize for peace?
4. How fast can currency be counted?
5. Where is the oldest painting of the Virgin and Child in existence?
6. Does it cost more to educate a child in a city school than in a rural school?
7. When gold is hammered into the thinnest leaf possible, what color is it?
8. What is the definition of a split infinitive?

Answers

1. A giant California Sequoia tree yielded 3,000 posts, 650,000 shingles and 100 cords of firewood. The upper one-third and the branches of the huge tree were not used.
2. It is estimated about thirty in a million will live to this advanced age.

3. Theodore Roosevelt, for his efforts in bringing about the treaty of peace between Japan and Russia in 1905. It was awarded him in 1906.
4. The expert counters of the Department of the Treasury have counted approximately as many as 40,000 new notes a day, and 25,000 old ones.
5. The oldest painting of the Virgin and Child in existence, done about 150 A. D., is on a wall in the famous Priscilla catacombs in Rome.
6. The average cost to educate a child in a rural school in the United States is \$53.31 a year, and the average in a city school is about \$96.18.
7. In this condition it appears green by transmitted light.
8. A split infinitive is one in which an adverb is introduced between the word "to," and the verb form, such as "to largely decrease." The word "to" as used with the infinitive is not to be classed as a preposition; it is an integral part of the infinitive and hence should not be separated from the verb form.

Achievement of Peace

YOU may either win your peace or buy it; win it, by resistance to evil; buy it, by compromise with evil. You may buy your peace with silenced consciences; you may buy it with broken vows—buy it with lying words—buy it with base connivances—buy it with the blood of the slain, and the cry of the captives over hemispheres of the earth, while you sit smiling at your serene hearths, muttering continually to yourselves, "Peace, peace," when there is no peace; but only captivity and death for you.

We Humans

In going through life we often bewail our misfortunes, but seldom dwell upon our blessings; the illness is reckoned to a day, the bad debt to computed to a cent, the sleepless night is spoken of with deep self-commiseration; but we forget to reckon the many months of our health; we take as a thing of course, and not worth mentioning, that we enjoyed hours of calm and refreshing sleep undisturbed even by a dream. — Wamego Times.

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