



Dr. Frank Fessler, New York chemist and one of the developers of the new compound, in a lab where he tests effect on the color of fabrics

Is Germfree Living

Before long, you may be buying clothes, toothbrushes and other articles which, thanks to treatment with a new chemical, will stay sterile throughout normal use. Tests indicate it will kill more germs than any of the wonder drugs

SILVER, long one of the most useful of metals, is about to play a new role in your life—as the base of a germicide which promises to be the most effective weapon against bacteria ever developed. Science has known for half a century that silver has great germ-killing powers, and for years men have been trying to find a way to mobilize those powers effectively. Now a group of researchers have succeeded, and a new silver complex compound which they have created will soon be available to the public in the form of products treated with it.

The compound, called Permachem

(pronounced *per-ma-kem*), will not only sterilize cloth, paper, powder, bristles and cosmetics, but in turn will give these products the power to kill many forms of bacteria on contact.

Up to now scientists have been unable to do much more than temporarily sterilize such objects; upon exposure to air they lost their surgical cleanliness. Under the new treatment, laboratory evidence indicates, common articles of use will stay sterile during the entire period of normal use.

By **MORTON SONTHEIMER**

Yet the compound doesn't affect the feel, color or odor of products treated with it. It can't be detected in a material except by chemical test. Fabrics containing it have been washed and dry-cleaned as many as 25 times, subjected to heat and ironing, and still remained self-sterilizing. Like other germicides, Permachem can be overwhelmed by a large concentration of bacteria, so that a bandage treated with it and applied to an infection would certainly no longer be sterile once it was removed.

But the chemists who developed the compound are confident that any item treated with it will stay permanently self-sterilizing throughout normal use.

If the new germicide fully lives up to its promise, the medical potentialities alone will be immense. Among the more obvious would be its use in bandages, dressings, surgical gowns and masks, and all hospital and sickroom linens. It would also have quite a wide range of possibilities for everyday use—in clothes, handkerchiefs, diapers, cleansing tissues, toilet paper, dentifrices, articles of feminine hygiene and baby toys.

Dr. Frank Fessler, one of the developers of the germicide and an officer of the Permchem Corporation, which owns it, describes Permchem as a process as well as a substance. The actual silver complex compound is a colorless solution of chemicals combined with another chemical manufactured by the company. However, the compound is of little value without the process. Objects to be treated are not only treated by the silver solution but are also passed through other solutions that protect them from discoloration and bind in the germicidal property.

Years of Work for Chemists

The treatment chemically fastens minute particles of germicide into the material's molecules without changing the color. This method of binding silver to various materials to make them deadly to germs was discovered in Europe but developed here. Chemists worked for 15 years to produce the Permchem formula and process.

Paper, textile and drug manufacturers are now testing the process and analyzing marketing problems with a view to negotiating rights with the Permchem Corporation to use it in consumer products. Treated commodities may be available in stores within six months. Only the treated products, not the compound, will be available to consumers.

How much they will cost the consumer is now being mulled over by interested manufacturers, but in any event the prices will vary; obviously, it will cost more to treat a large blanket than a small toy. The compound is cheap to make because of the minute quantities of silver used, and its addition to any item should not add materially to the cost.

The claims made for Permchem are large. They should be viewed with some of the skepticism that the medi-

cal profession will certainly manifest. When the writer described the company's experiments and expectations to a public-health authority, an expert on germicides, he commented: "I am frankly dubious. There appears to be little clinical evidence of the product's purported powers, there is insufficient assurance that it will be harmless to humans, and there is doubtful need for it in many of the forms in which people will surely want to use it."

Although this doctor had never had any experience with Permchem, his was the typically guarded reaction of medical men, who have learned to go slow concerning new discoveries. As wonder drugs have piled up in the great research surge of recent years, many have failed to live up to early promise. Only studied use over a long period of time can prove the effectiveness and safety of any medical discovery. And no germicide is 100 per cent effective. One reason is that germs develop resistance to lethal environments.

More Clinical Testing Needed

Nobody can foretell, therefore, whether or how they might resist the killing power of silver until it comes into popular use as a germicide. And since the new formula is comparatively untried, no one can say with absolute certainty what it will accomplish or what its limitations may be. Much wider clinical testing will be needed before Permchem meets the standards of the medical profession.

At this stage, laboratory tests are the chief gauge of Permchem's effectiveness. After its own successful experiments, the company turned over textiles and powders it had processed to independent laboratories for study. Reports from private laboratories indicate that the Permchem-treated substances overwhelmed a greater variety of bacteria than did penicillin or any other anti-

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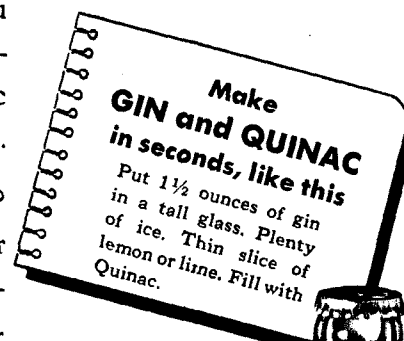
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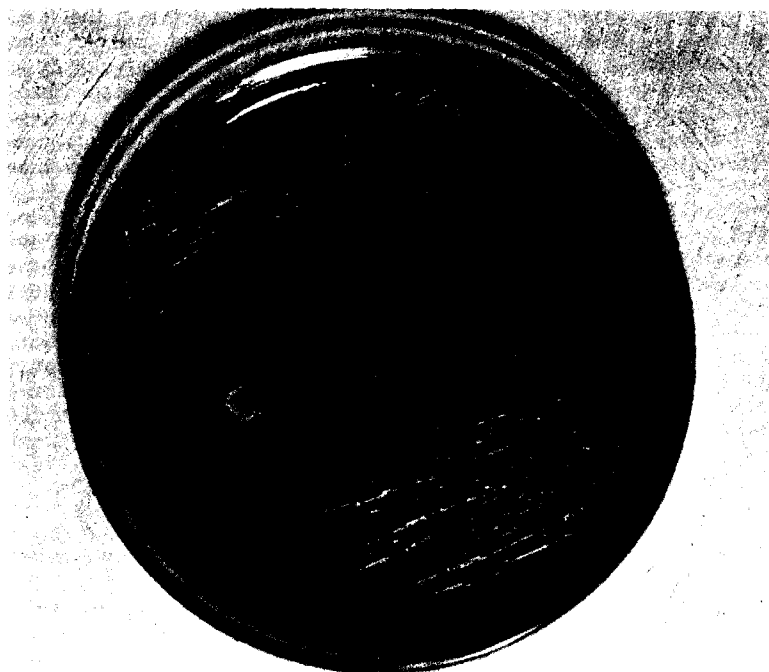
GIN AND Quinac

QUININE WATER



Next?

Three pieces of paper toweling were put over a dish containing *Staphylococcus aureus*, the germ causing boils. Two (marked 6 and 7) were Permchem-treated. Darkening shows the bacteria in them were destroyed. The third (marked C) was not treated



Researchers report the new germicide is effective against 14 organisms. One of

biotic. These reports were not endorsements of the product, but simply routine accounts of test results.

In addition, the company permitted this writer to submit samples of treated powders and fabrics to the bacteriological labs of a leading Midwestern university—one which must go unnamed because of a university ban on publication of its name in connection with such experiments. The university tested three separate samples of both powder and fabric against four common and dangerous germs: staphylococcus, which is present in practically all sinus, nose and throat infections and produces boils, abscesses, carbuncles and impetigo; streptococcus, the general cause of so-called "blood poisoning"; colon bacillus, which is found in peritonitis, diseases of the genitourinary tract and female pelvis, and sometimes meningitis; and *Neisseria catarrhalis*, which causes inflammation of the mucous membrane and is believed to be one of the germs that may be involved in the cold.

The university technicians heavily inoculated glass plates with the living bacteria, then put small quantities of the Permachem-treated powders and textiles on them. Within 24 hours, the samples were free of bacteria. So was an area around them.

The other independent laboratory tests have indicated that the formula is effective against fungi, molds and mildews as well as disease germs. A fungus that it destroyed was trichophyton gypseum, one of the fungi which cause athlete's foot. In the opinion of Permachem's developers, it is possible that the hosiery you wear in the future may protect you from athlete's foot, and that active cases of the disease could be treated with a combination of the powder and processed hosiery.

Old Fungus Infection Cured

A Liberian diplomat, a friend of one of the doctors working with Permachem, had a fungus infection of the hand that had resisted treatment for many years. The doctor allowed him to sprinkle the new powder over the infections, and the diplomat came back 24 hours later showing every evidence of a cure.

Another physician gave his patients 100 toothbrushes with Permachem-treated bristles. He instructed them to use the brushes at least twice a day and bring them back after a month. On examining the returned toothbrushes in his laboratory, he reported that all were free of bacteria.

Another prospect advanced by Permachem's sponsors is the use of the process in hairbrushes. Some barber and beauty shops steam-sterilize brushes every time they are used, but many do not, and if the latter group would employ Permachem-treated articles, a suspected major cause of scalp infections probably would be eliminated.

Chemists in the New York laboratory of the Permachem Corporation also have combined the silver with liquid soap and laundry starch, raising the possibility that household linens and wearing apparel may someday be treated at home. While this treatment should give the materials a germicidal property, the effect would be only temporary, and tests have revealed that it might not be deadly to fungi. The re-



searchers are now trying to introduce Permachem into a solid soap.

An officer of the Permachem Corporation points out that germicidal laundering has a special interest for travelers, who sleep between laundered sheets. Hotels and Pullmans could achieve the last word in sanitation with self-sterilizing blankets and mattresses.

Only a fraction of the items that might be treated with Permachem have been tested to date. Company technicians hope to combine it with floor wax, rugs, plastics and cement. Theoretically, at least, there appears little reason why these could not be made germicidal, too. Thus far, the only common substance the researchers have found that usually nullifies the germ-killing power of the silver is glue; the chemical structure of glue is such that the germicide rarely can penetrate it.

Experiments at a medical college showed Permachem to be effective against 14 organisms, including one of the organisms which is said to cause dandruff and another generally blamed for tooth decay. The company's own labs have already produced an experimental tooth powder, and lotions that can be applied to the skin or scalp, all containing the compound.

Independent laboratory studies provided evidence that the formula has some effect against the bacillus of TB, and that it inhibits one of the viruses that cause influenza. These findings, Permachem officials believe, make their product particularly promising for use in handkerchiefs and for sanitary measures in sanatoriums.

Even if Permachem should live up to all its discoverers' hopes, Dr. D. K. Kitchen, an officer of the Permachem

Corporation, points out, it would be able only to reduce disease, certainly not to eliminate it.

Besides, Permachem researchers are sure they will encounter strains of bacteria against which the silver preparation is ineffectual. The company doesn't offer the process as a complete substitute for the present steam-sterilizing of surgical dressings, but as a supplemental measure to maintain their sterility.

Wartime uses for any method that would make cloth self-sterilizing would be innumerable. One of the gravest problems connected with our defense against atomic attack is that there could be a dire shortage of dressings available to treat the burns and wounds of casualties. But if every bedsheet could be sterile, that problem would be considerably smaller.

For Defense in Germ Warfare

The silver compound has been pitted against one of the bacteria that could be expected in germ warfare, and reported effective. Permachem technicians are planning a new study to determine whether it can be incorporated into paints and air-conditioning units to cut down the possibilities of infection in shelters.

Another wartime role for the germicide may lie in the protection of equipment. During and after the last war, millions of dollars of military supplies were destroyed by mold and mildew, particularly in the tropics. While researchers have not determined how many kinds of fungi the silver compound will eradicate, they are convinced that coverings of Permachem-treated paper and cloth can preserve much material for the armed forces and industry as well.

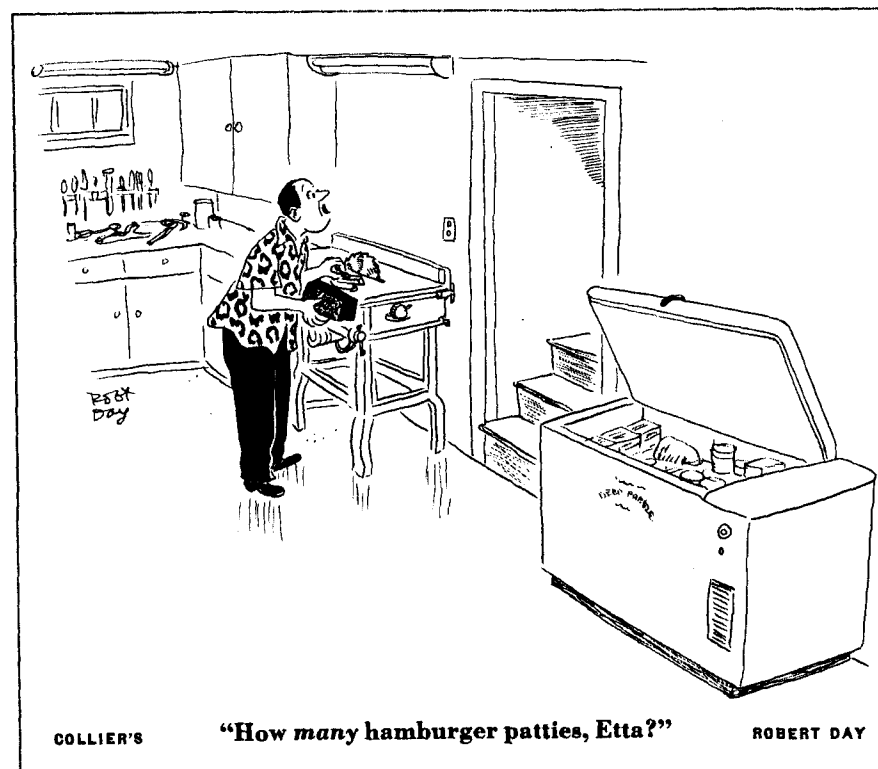
The researches that culminated in the new process were begun in 1893, when a Swiss botanist named Carl Nägeli discovered that traces of certain metals kill bacteria. Scientists soon recognized that silver was best suited for the job because it was least harmful to human life.

But for a long time, they were unable to find a satisfactory way of using it. The nearest approach was the common antiseptic, silver nitrate, a salt of silver that is highly inflammatory to human tissues.

Several years ago a German scientist, A. G. Krause, developed a method of sterilizing water by forcing it over substances like sand and gravel that had been impregnated with silver. The method, known as the Katadyn process, is widely used in Europe. Other European researchers adapted the process to preserve fruit juices. They found that the metal killed the organisms that ferment fruit juices.

Then Samuel Rosenzweig, a Viennese chemist and pharmacist, discovered a way of using silver to make bristles and natural sponges germicidal. Brushes with Permachem-treated bristles and sponges actually went on sale in Austria and France before the war. Their popularity suffered because the silver treatment turned the bristles and sponges a disagreeable black in color.

Rosenzweig was still troubled by this blackening problem when he fled the Nazis and came to America with his secret. In New York he met and interested Dr. Walter M. Fuchs, a German



them causes dandruff, another tooth decay

scientist. Fuchs helped develop the process of impregnating textiles with the silver complex compound and patented it.

It remained for Dr. Frank Fessler, a New York chemist, to achieve the final improvement. Rosenzweig told him: "Here is what amounts to a dyeing process. We have found that it will give germicidal properties to materials at the same time that it changes the color. Your job is to stop it from changing the color, yet combine it with the material as before so that the germicidal properties remain."

Scientists who specialize in developing dyes have never discovered the exact means by which a good dye locks

the body to replace bone fragments."

If Permchem formula lives up to its experimental promise of potential, a typical day in your future might shape up like this:

You brush your teeth in the morning with a sterile tooth brush and germicidal dentifrice, then use antiseptic shaving preparations or make-up (including lipstick).

You sit down to a breakfast starting with fruit juice which the manufacturer has treated to prevent spoilage. Next comes cereal poured from a germ-proof wrapping.

You grab a germfree strap on the bus and go to work in a room with air filtered free of bacteria. The working



"But it's hardly worth while when you consider the work involved in digging up the other 75%"

COLLIER'S

HERB WILLIAMS

itself into the molecules of a material to remain there for life. All Fessler knew was that the silver complex compound acted in approximately the same way as a dye.

When he finally succeeded in eliminating the discoloration without destroying the germicidal properties, he exposed his treated fabrics to sunlight for four months and to ultraviolet rays for 80 hours. There was no darkening.

Chemist Tried It in Candy

The researchers' conviction that the metal in certain states can be deadly to germs while remaining safe for humans was partly confirmed by studies of the American Silver Producers Research Project of the U.S. Bureau of Standards, published in 1940. The experimental uses of Permchem on humans and animals have brought no reports of irritating effects. Although the compound is not intended for internal use, Fessler even put some of it in candy and ate it.

"It tasted awful," he reported, "but it had no harmful results. After all, we've been using silver table utensils for centuries without being poisoned. Even the surgeons of early times found they could safely insert silver plates in

surface under your hands is also treated. In the lavatory you use a self-sterilizing toilet seat, wash your hands with germicidal soap and dry them on sterilizing towels.

You blow your nose into germ-killing handkerchiefs or tissues. At the restaurant at lunch you wipe your mouth on a germicidal napkin.

Your baby, meanwhile, is playing on a sterilized floor in a sanitary diaper, sucking safely on an uncontaminated calico cat. When he gets a little older, he may study out of treated textbooks that can carry no infection from one child to another.

You'll wash the supper dishes with germicidal soap, and after you've read the old-fashioned germ-ridden newspaper and put out the carefree cat with all his bacteria, the whole family can turn in for a night's sleep on sterilized bedding. You might even wear germicidal night clothes.

Not that Permchem promises a wholly antiseptic existence in the future. Germfree living is probably not only impossible to bring about, but it's almost certainly undesirable. If some bacteria kill us, others make it possible for us to live. The new silver germicide may give us a golden chance to strike a better balance in Nature. ▲▲▲

Yes...MIRACLES Happened at Fatima!



You may not agree with the Catholic belief in miracles.

Perhaps you don't believe in miracles at all... and especially not in miracles attributed to the prayer of the Blessed Virgin.

But if God does look with special favor upon Mary... and does wondrous things at her request... is it not of vast importance to you to find out? Is it not worth the few minutes required to examine the evidence?

What, for example, did God's angel mean when he said:

"Hail, full of grace, the Lord is with thee; blessed art thou amongst women..."

Was she to be "full of grace" only temporarily—and "blessed amongst women" only during her life on earth?

This is not reasonable in view of Mary's unique role as the earthly mother of the Son of God. Nor can we discard and forget Mary if we believe Holy Scripture, for there we find Mary's words (Luke 1:48); "...henceforth all generations shall call me blessed." Where, excepting among Catholics, does anyone honor Mary as did God Himself?

"But," you may insist, "show me a miracle! And prove that the Blessed Virgin had anything to do with it."

We might, of course, recall that Christ's mother appeared to Bernadette at Lourdes in France, and that scientifically-authenticated cures have been occurring there ever since. Or we might cite similar apparitions to the three children at Fatima, Portugal, and the subsequent awesome spectacle of the sun spinning and dancing on its axis and then seeming to plunge toward the earth... a spectacle witnessed by 70,000 persons. And we could mention Mary's prophecies concerning the conditions under which Russia would be converted.

But Catholics don't require earth-

shaking supernatural demonstrations to attest Mary's love, nor to prove her influence at the throne of God. It's the little "miracles" that take place in their daily lives when... in faith and trust... they pray: "Hail, Mary, full of grace, the Lord is with thee..."

Catholics pray for one another. They also ask the saints in Heaven to join them in prayer. "I believe," says the Apostles' creed, "in the communion of saints." And Mary, the Mother of Jesus, is in Catholic hearts the greatest of the saints. So we ask her to intercede for us with God... and God has often performed miracles in answer to her prayer.

An exciting pamphlet on Fatima... containing prophecies by the Blessed Mother concerning the conversion of Russia and a peace plan from Heaven will be sent in a plain wrapper at your request. And nobody will call on you. Write today for Pamphlet No. C-41.

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Personal To Women With Nagging Backache

Nagging backache, loss of pep and energy, headaches and dizziness may be due to slowdown of kidney function. Doctors say good kidney function is very important to good health. When some everyday condition, such as stress and strain, causes this important function to slow down, many folks suffer nagging backache—feel miserable.

Don't neglect your kidneys if these conditions bother you. Try Doan's Pills—a mild diuretic. Used successfully by millions for over 50 years. It's amazing how many times Doan's give happy relief from these discomforts—help the 15 miles of kidney tubes and filters flush out waste. Get Doan's Pills today!

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"Pardon me, aren't you that famous television star Kitty Clyde?" I said. "Oh, yes, I am," she said, and fell on my neck, weeping most bitterly