

CHEMISTRY

Packaging for Protection

Packages, instead of being wrapped in paper, are now protected by sprayed-on coverings which keep the contents water-proof. Unwrapping means peeling off the film.

By CAROLINE PARKINSON

➤ A NEW washing machine arriving in a skin-tight package sprayed on before shipping will probably not amaze a returning serviceman as much as it will his mother when she receives it in the postwar future.

On duty at a debarkation center for war goods, soldiers have helped "unwrap" entire fighter planes. This involves peeling off the transparent, plastic film which has protected them from rain, sleet, and sea water on the passage across.

Beer in bags, a day's supply of cold cream in a gelatine capsule, and a tractor in a form-fitting package may be a postwar surprise for us, but old stuff for GI Joe. He knew them when they were new war weapons developed in the face of mildew in India, rains in New Guinea, and breakage in passage. By destroying one-fifth of all war goods before they could ever be used at the front, these damages of nature were a greater menace than submarine warfare.

New Wrappings

The most ingenious packages which we will see on the market in a few years are the ones devised to keep our equipment dry. The old way involved smearing fighter planes in waterproof petroleum compounds before loading them onto the deck of a transport. In the course of an ocean voyage, the greases would harden, and admit moisture through shrinkage cracks. At the end of the voyage, it took 250 man-hours of labor as well as large quantities of solvents to unpack one plane.

Today a new fighter plane first has its small openings covered with heavy tape, then larger ones with plywood filling. The entire plane is sprayed with three coatings of plastic film, based on a vinylite resin. The plane can be completely "wrapped" in two hours by a two-man team.

The transparent, form-fitting coat is elastic enough to flex with the movement of the plane and does not get brittle in sun, wind, or cold. Three or four

soldiers can strip the plane in about an hour.

Refrigerators, washing machines, farm equipment, hydraulic presses and outboard motors may soon be shipped in spray-gun packages.

Another hero of the packaging front is the good old brown paper bag. Impregnation with a synthetic resin to give it wet-strength properties has allowed the paper bag to save valuable cargo space and weight. It carries vegetables, meats and chemicals, formerly packed in heavy metal containers.

Water-Proof Cartons

A paper board carton which can sit in steaming jungles or tumble in the surf for two weeks and still deliver the goods dry is another product of cooperation between chemist and paper manufacturer. Fresh fish surrounded by water ice can be sent back and forth across the country, packed in the V-board cartons.

Wet-strengthening, grease-proofing, dirt-proofing, heat-proofing, multi-wall processes have made cardboard so valuable that it is now on the critical list of materials along with the metals it has replaced.

While the Japs sneaked through the jungles to attack South Pacific forces from behind, tropical storms from above would rust valuable guns and equipment beyond use. So experts at home developed a plastic compound which would harden as a waterproof coating on machine parts dipped into it. It saves 60 to 90 per cent of the time required for conventional wrapping or wax dipping and will enable postwar industry to keep articles of machinery in stock indefinitely.

Metal machine parts are wrapped in transparent plio-film to keep them from rusting while waiting in assembly lines. Bags of silica gel are tied to the metal parts before wrapping to absorb any moisture from the air which has been trapped within the plio-film package. Silica gel is used because it is too inert to start up any chemical reaction with the metal finishes.

An ingenious color indicator enclosed in the package is used as a signal: when

the upper limit of humidity is reached it changes color, which can be seen through the transparent plio-film. This means that the silica gel bags have absorbed their fill of water and must be recharged.

Plane parts and medical instruments come to the men at the front in laminated grease-proof, heat-proof transparent bags. Some day meat loaf and scrap-ple will come to the housewife in similar reinforced wrappings ready without washing to slip into a baking dish. Dill pickles will arrive brined in neat little packages of two. Cleaned, scraped and trimmed carrots, beets, and other vegetables will come in cellophane bags similar to the ones now sealed around airplane parts.

The Twin-Pack idea that enables the housewife to open one half of a loaf of bread and keep the other half fresh is regulation for Army K rations. The concentrated meat, biscuits, chocolate, and fruit of each meal are separately wrapped in grease-proof, moisture-proof paper. In this way a pilot in action can grab his meal over a period of hours if necessary without danger of part of it spoiling while the rest is being eaten.

Each meal is in a wax-dipped box



"LIQUID ENVELOPE" — A P-47 Thunderbolt gets a spray of hard skin which will protect it against wind and weather during its ocean voyage.



WELL WRAPPED—The food and equipment sent our troops must withstand all kinds of treatment. These provisions for Allied forces are shown being landed on the drab shores of the western Aleutians, in this U. S. Navy photograph.

which the Quartermaster has specified because it guarantees that the meal will be in good condition whether the soldier opens it in a steaming South Pacific jungle, in the baking heat of North Africa, or in the sub-zero cold of Arctic regions.

Wax paper replaces the aluminum foil around chewing gum and cigarets, thus releasing the metal for more direct use in war industries.

Open-Mesh Bags

When the supply of boxes and crates runs out, fruit and vegetable shippers use an open-mesh bag, made from strips of tough paper spun into yarn and woven into open-mesh cloth. They are made in various colors to contrast or harmonize with the contents. Because of their low cost, space and weight saving, and ease in filling and closing, they are likely to persist after the war as improvements instead of substitutes.

One of the biggest problems has been to design a method of packaging that would withstand sudden extremes of temperature. A plane, for example, is loaded in a tropical jungle. It flies at high altitudes where the temperature is frequently 60 degrees below zero; it lands on another steaming jungle airstrip. To lick this air transport problem, Army Ordnance provides a type of container

that expands and contracts without breaking the outer protective seal and covering.

The problem of breakage is solved by balanced rather than rigid packing. Heavy equipment is suspended by supports in specially constructed boxes. Like yolk in eggs, it remains balanced even when tossed around.

Today, gelatine capsules provide the gay colored camouflage for vitamin pills. Tomorrow, with stiff necks and screw tops, they will package a day's supply of shaving cream or perfume. Flavoring extract, and cigaret lighter fluid in individual containers will be the peacetime versions of the gelatine capsules now substituting for metal and plastic tubes in the soldiers' kits.

Automatic filling, uniform dosage, low-cost, high-speed production, long-term protection and sanitation are the obvious advantages of capsule packaging. We may look forward to having these gay capsules, containing just enough toothpaste or cold cream for our week-end visit, become a standard part of our peacetime traveling equipment.

Science News Letter, October 21, 1944

The *Oranje mountains* in New Guinea have many snow-capped peaks, although they are very close to the equator; they are over 15,000 feet high.

CHEMISTRY

Unusual Body Chemical Acts as Storage Depot

➤ AN UNUSUAL body chemical with the specific job of acting as storage depot for iron for the blood was announced by Dr. Leonor Michaelis and Dr. S. Granick, of the Rockefeller Institute for Medical Research, at the meeting of the American Chemical Society in New York.

The chemical is a protein called apoferritin. When it contains iron, it is called ferritin. Neither ferritin nor apoferritin is found in the blood, but ferritin is found in many organs of the body. The ferritin of one animal species is not quite identical with that of another, but within one animal species, it is the same whether derived from liver, spleen, bone marrow or blood.

Apoferritin is a novel type of protein, differing from all other protein compounds of the organism. The iron it stores is rather special, too, in that its magnetic property or susceptibility is of a magnitude not found in any other of the normally occurring iron compounds of the living organism and extremely rarely in iron compounds in general.

The role of apoferritin, the scientists reported, is to store the iron from food or from blood cells used up by age and decay and to make the iron available for manufacture of fresh hemoglobin. Hemoglobin is the red coloring matter of the blood which has the vital role of carrying oxygen throughout the body.

"Why a particular, specific protein is needed to accumulate iron for storage remains a puzzling problem," the scientists stated. "In any case the iron of ferritin accounts nearly quantitatively for all of the iron of the organism which is not a blood pigment or a derivative of such."

Science News Letter, October 21, 1944

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