TECHNOLOGY

Keeping Afloat

Milkweed, glass and plastic used to make new life-saving devices. Promise to be more satisfactory than war-scarce materials which they replace.

By DR. FRANK THONE

➤ KEEPING AFLOAT, these stormy days, has become a problem. Not just in the figurative sense, but literally afloat, in actual water. Life preservers, rescue floats, life rafts and other kinds of floating gear must be produced in much greater volume now than ever before. At the same time there are war-caused shortages in the long-accepted standard materials, notably cork, kapok fiber and balsa wood.

Substitutes shown on the cover of this week's SCIENCE NEWS LETTER promise to prove more satisfactory than the originals. For some uses at least, there is every likelihood of their keeping their war-won jobs permanently, even against reviving competition which returning peace may bring.

A substitute may or may not resemble closely the material for which it is taking over. The important thing is that it shall do the same job at least as well, and if possible do it better.

It happens that one of the new flotation materials does closely resemble the stuff it replaces. This is milkweed floss, subbing for kapok. Kapok is the downy floss that carries the seeds of the tropical tree of the same name. Some kapok trees grow in tropical America, but most of them are in the Japanese-occupied East Indies.

But we have no end of milkweed, growing wild over vast areas in this country. Until recently, it has never been cultivated, but it can easily be grown in fields if we want to. It is a perennial, but grows easily from seed, and then bears its fluffy crop year after year. Being a perennial, it has distinct value as a soil-holder, to combat erosion.

Most active in promoting the use of milkweed floss as a replacement for kapok is a Chicago physician, Dr. Boris Berkman, former director of the Pasteur Station in Moscow. He has been experimenting with possible products from milkweed for several years, so that when the emergency arose he was ready to do something about it.

Farmers were encouraged to grow the plant, and about a million pounds of the floss, worth $200,000, are being produced for the U. S. Navy from the pods of this once neglected weed.

One reason why milkweed did not come into its own any sooner was the high cost of separating the floss from the seed by hand. Dr. Berkman has designed machinery to loosen the seed and winnow the floss away with a current of air. This cuts the cost very materially.

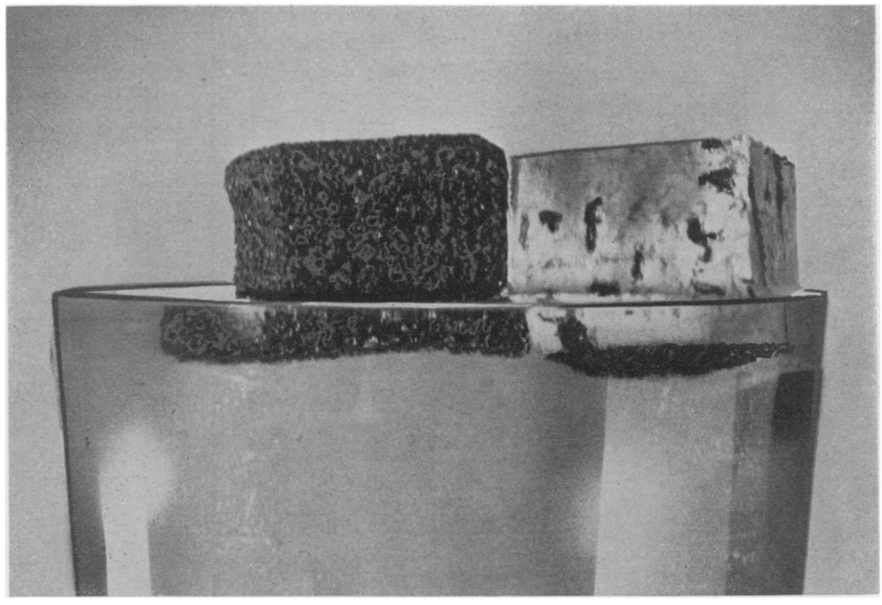
Promising by-products from the new milkweed industry are fiber and cellulose from stalks and leaves, furfural from the pod shells, and oil and stock feed from the seed.

Bubbles have long captured the fancy of children (of all ages up to 95) by the way they float on top of the water.

They would make ideal fillers for life-belts if they could only be made permanent.

That is just what chemists of the great du Pont firm have done. They have spun out continuous strings of bubbles made of light, transparent cellulose plastic, which have been given the trade name of Bubblfil. The material is now being manufactured at the du Pont's Tennessee plant.

Tests already made show that the



BETTER—The chunk of glass filled with tiny bubbles (left), floats with even more buoyancy than war-scarce cork.

cellulose bubbles are fully as buoyant as kapok. The new product has been considered for life jackets of the type used in the Navy, for which kapok has been used in the past. Bubblfil has also been used in the air compartments of lifeboats and life rafts, and it is proposed for bridge pontoons. If these air compartments are punctured by bullets or shell fragments the tough, shining bubble masses will keep the craft afloat.

Bubblfil is an excellent example of a substitute surpassing the original material in at least some properties, for tests show that it loses buoyancy less rapidly than kapok upon prolonged immersion in water. That means that a life belt, or a pontoon that had been punctured, would stay afloat much longer before it began to become waterlogged and in danger of sinking.

The bubbles cannot be broken by squeezing, nor will they rupture at the extremely low pressures of high altitudes. In laboratory tests they remained intact when air pressure was reduced to that found at an altitude of over 50,000 feet. The transparent cellulose that forms the bubble walls is also quite stable at extreme temperatures. Heating above 200 degrees Fahrenheit for three days and chilling to 28 degrees below zero failed to break the bubbles.

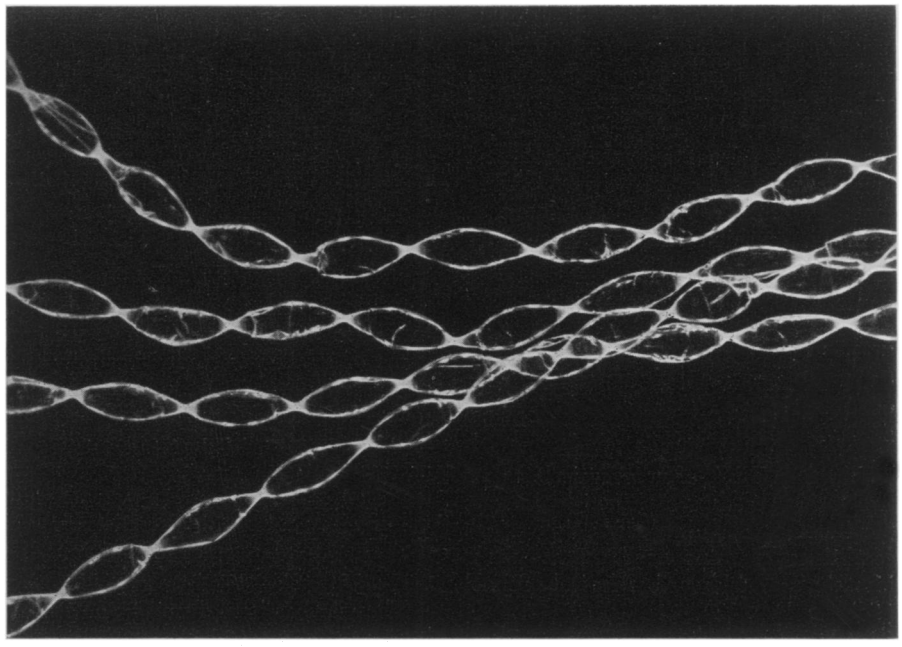
Floating Glass

Bubbles of another material give high flotation value to a third product, known commercially as Foamglas, which is manufactured by the Pittsburgh Corning Corporation.

Foamglas is produced by firing ordinary glass which has been mixed with a small quantity of pure carbon. At the proper temperature the glass softens and the carbon turns into a gas, which then acts upon the molten glass very much as baking powder does in raising biscuits, filling it with a mass of tiny bubbles. The foamy mass is then allowed to cool, and in its final state it becomes a stiff but spongy black substance, exceedingly light, and of course capable of remaining afloat indefinitely because glass takes in no water at all and hence can never become water-logged.

Foamglas can be sawed, shaped and drilled with ordinary tools. If a block of it is hit with a bullet or other missle, the cells in the immediate path of destruction are of course wiped out, but the rest of the structure is unaffected.

Because of the large amounts of finely subdivided air which all three of these



LIFESAVER—Strings of buoyant bubbles made of cellulose plastic have been used in air compartments of lifeboats and life rafts, and proposed for bridge pontoons. Tough and stable at extremes of temperature, this substiute is better in some respects than the original buoyant materials which are now so difficult to obtain.

materials contain, they are all valuable for heat insulation in such things as refrigerator walls, the sides and roofs of houses, and around steam and water pipes. Because they are very light, they can be used also for packing material in carrying vessels that help keep their contents either cold or hot. Moreover, they will cushion the inner container against jars and jolts in transit.

Science News Letter, February 20, 1943

MEDICINE

Injury Factor Discovered Which Induces Inflammation

➤ DISCOVERY of a chemical, tentatively named necrosin, which induces the inflammation that occurs in various conditions, is announced by Dr. Valy Menkin, of Harvard Medical School (*Science,* Feb. 12).

Besides the redness and swelling which the layman recognizes as signs of inflammation, there are other disturbances of the body cells recognized by scientists. These inflammatory changes all follow the same pattern, regardless of what part of the body is inflamed or what injury or disease germ started the inflammation. Search for the underlying factor that causes the cell injury which results in inflammation led to discovery of necrosin.

Necrosin has not yet been chemically identified but is associated with a protein called euglobulin. Dr. Menkin found necrosin in exudates from dogs and man like, for example, the exudate in inflammations such as pleurisy.

Science News Letter, February 20, 1943

WILDLIFE

Wildlife Ups Meat Supply

Former delicacies such as venison, wild duck and reindeer are now being used to take the place of scarce beef, pork and lamb.

➤ VENISON, wild duck, mountain trout: these and other gourmets' dainties in times of abundance have become items of straight-out nutrition now that meat rationing is upon us. How to make the most of our wild game and fish resources without endangering the necessary breeding stocks was discussed from all possible angles by leaders in wildlife research and administration at the eighth North American Wildlife Conference in Denver.

The war has brought many new problems to the men who watch over the mammals and birds of our wodlands and the fish of our streams and lakes. Hunters' ammunition supplies have been "frozen", new fishing tackle is not being made, many sportsmen are in the armed services or too busy in war work to go hunting and fishing, new populations have migrated into hitherto sparsely inhabited places in the West, game surplushes threaten to multiply to the mass starvation point if not shot down to normal levels—these are only a few of the headaches which the members of the Conference tried to alleviate in their discussions.

Science News Letter, February 20, 1943

Reindeer Steaks for Army

➤ ONE BIG-GAME surplus that turns out to be a piece of good fortune for the U. S. Army is the overpopulation of reindeer on Nunivak island, off the coast of Alaska. From fewer than 200 animals planted there shortly after the first World War, the herd on the island has increased to an estimated 19,000. The available browse will support only about 10,000, so the surplus must be killed off. The situation was described by Clifford C. Presnall of the U. S. Fish and Wildlife Service, who is in charge of wildlife on Indian lands.

The program calls for the killing of all buck fawns of the 1943 crop, Mr. Presnall told his audience; their hides will be used in making sleeping bags and mukluks (Eskimo type boots). Surplus adults will be killed, beginning next fall, until the herd is down to 10,000 head. Meat will be supplied to the armed forces so far as required, and the rest will be made available for civilian use through regular market channels.

Science News Letter, February 20, 1943

Surplus Elk Goes to Indians

➤ YELLOWSTONE PARK has long had a problem in the increase of the two elk herds that pasture within its boundaries in summer and migrate down-valley in winter, stated Victor H. Cahalane, National Park Service naturalist. There is no hunting in any national park, so that the animals are protected as long as they stay inside. The surplus, therefore, can be kept down by hunting only when the elk migrate out in the winter.

Recent winters have been mild, and the elk have stayed within park boundaries most of the time. Add to this the severe damage their natural forage suffered during the droughts of the mid-1930's, and you have the makings of severe difficulties for the Park Service wildlife administrators.

During the present winter, cooperation of state and national agencies, favored by weather and other factors, has made possible a total reduction of 7,230 elk, nearly a tenth of which were killed within the park by rangers under official instruction. The meat was utilized by the Indians, and to some extent by Montana residents.

Science News Letter, February 20, 1943

Game Slaughter Opposed

➤ PROPOSALS to treat surplus game as meat animals, simply killing them en masse to get rid of surpluses, were opposed by Ross Leonard, director of the Utah Fish and Game Department. It is better, Mr. Leonard held, to permit the time-tried method of licensed and controlled hunting to reduce the size of the herd. Exceptions may occasionally be made, as where elk become locally too numerous and take to raiding ranchers' haystacks too persistently.

The speaker recognized factors that may operate against a normal hunting