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GYROSCOPE. Jap suicide pilots, hurling themselves at our warships, ran into an unexpected obstacle—a top that calculates the lead angle for an antiaircraft gun in the twinkling of an eye. On page 86 Gold Sanders tells how the gyroscope, once only a scientific toy, has become one of the major weapons of modern warfare.

EDITOR Charles McLendon
ASSISTANT EDITOR Arthur Wakeling
AVIATION EDITOR C. B. Colby
HOME & WORKSHOP EDITOR Harry Walton

EDITORIAL ASSOCIATES: Fred O. Newman, news editor; Alden P. Armagnac, B. T. Richards, Harry Samuels, Michele de Santis, Volta Torrey, Frank Rowsome, Jr., Carl W. Bertsch, Ruth Westphal, Edward F. Allen, Devon Francis, Gold V. Sanders, James L. Freeman, R. P. Stevenson, Robert Gorman, Elsie E. Brandt.

ART ASSOCIATES: Stewart Rouse, William Patrick, Samuel Dukler, Evelyn Cooper.

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POPULAR SCIENCE



In the camp at Sagan, Major Orris and his fellow prisoners provided for their needs with homemade equipment described on the following pages. At the right is their symbolic version of AAF wings.



Yankee Ingenuity Licks Prison-Camp Hardships

By VOLTA TORREY

FOR Maj. William Orris and hundreds of other American airmen, being captured by the Germans was like being stranded in an incredibly weird and inadequate world. They were always hungry. They had no tools, and scarcely any material except tin cans. Yet they re-equipped themselves with nearly as many things as a novelty store sells—and they pulled through.

Orris is a tall, bright-eyed pilot who parachuted into the enemy's custody five weeks before D-day and escaped three weeks before VE-day. His B-24 was hit by flak in a bombing run over Toulon. Blinded and nauseated by gasoline fumes, he went out

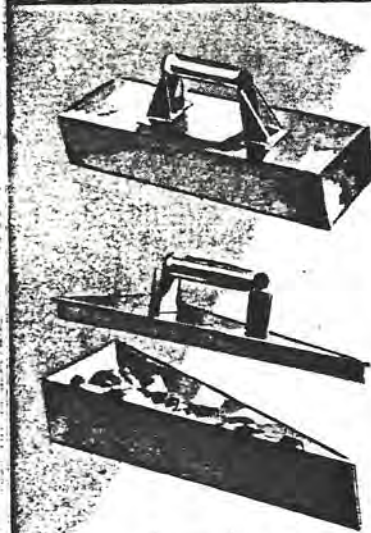


MAJ. WILLIAM ORRIS bailed out into captivity five weeks before D-day, was a prisoner for over 11 months.

JULY, 1945

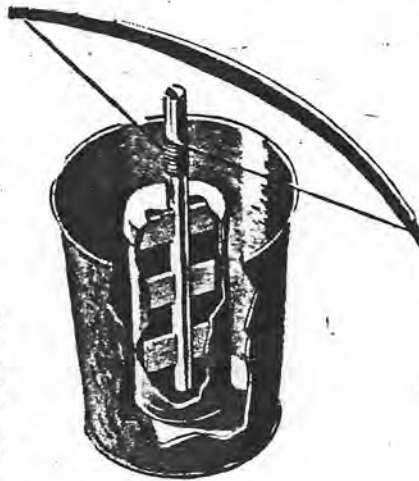


OVENS, like practically everything else the prisoners made for themselves, were fashioned laboriously from old food containers. There were two types, both to be attached to camp heating stoves.



FLATIRONS were tin boxes which were filled with hot coals. Two styles are seen above. The prisoners had such clothes as they were captured in, plus some "booty" garments of various kinds that the Germans seized and issued to them. They did their own washing and pressing.

ICE-CREAM FREEZER was one of the most elaborate kitchen utensils produced by the "kriegies." Tin paddles attached to a tube were rotated by pushing the bow to and fro. Ice cream was enjoyed only in the winter, when ice was plentiful—outdoors. All the tin used came from containers no bigger than coffee cans, cut and joined as shown below.

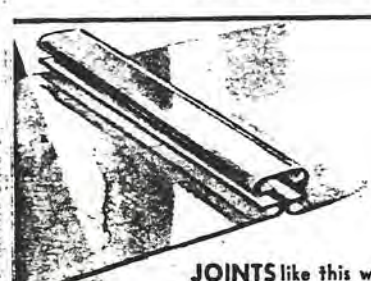


through the bomb bay and lit in a tree beside German headquarters. Looking back, he saw his own plane explode and the rest of his squadron disappear beyond the horizon. "Boy," he says, "I sure felt lonely."

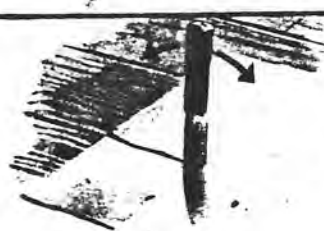
But the Major was luckier than many kriegies (war prisoners of the Nazis). He learned the next morning that his crew was safe. He was questioned cunningly and paraded before French and German civilians. But he was not tortured, and he believes the Luftwaffe's prison camp at Sagan, southeast of Berlin, in which he was confined for the next eight months, was one of the best in Germany.

Even so, the food at this camp was neither good nor sufficient. But at first each man got a Red Cross parcel once a week, and Orris received one of the two dozen packages that his family sent, and about a fifth of the mail addressed to him from America.

With tin cans as shovels, the boys leveled two baseball diamonds for themselves and cleaned out a water tank to swim in. But they soon talked and dreamed more about food than about sports or home or girls. Planning future menus was a favorite occupation, and Orris is carrying out those plans now. While talking to **POPULAR SCIENCE MONTHLY'S** editors, he lunched on a fruit cocktail, two helpings of roast duck with all the



JOINTS like this were used in patching together the tin taken from food containers.



CUTTING of tin was managed with a knife blade stuck into a floor crack and worked to and fro like a can opener.



SOLDERING. Specks of solder salvaged from can tops were applied with rods made from the handles of jam buckets.

trimmings, and a strawberry shortcake smothered in ice cream.

On a typical day while he was a PW, his breakfast was a cup of poor coffee and two slices of toasted but sour black bread, as thin as Melba toast. Lunch was another slice of bread and a bowl of barley soup as tasty as dishwater. And the day's big meal was half a bowl of potatoes and cabbage with just enough meat to whet a soldier's appetite.

The kriegies were required to punch two holes immediately in every can of food they received from the Red Cross. This was to keep them from saving some for attempts to escape. Another result was that much of the food spoiled, and many men had dysentery.

When a rabbit came through the barbed wire, 70 or 80 of the imprisoned airmen would chase it like dogs. Even three cats that were pets of the prisoners were sacrificed after days of discussion and planning. One man was detailed to stun each cat with a club, another to skin it, and so on. The first man did not hit his cat hard enough, and it got away, but finally the disagreeable job was done, and the men who ate the cat meat said it was good.

The Germans let them have gardens, which they spaded and raked with tin cans. But the soil was miserable, and American officers solemnly followed the horses whenever a wagon entered the camp, waiting for manure. They even built a trap to jolt the cart that carried waste away from the latrine, and salvaged the stuff that spilled out as fertilizer.

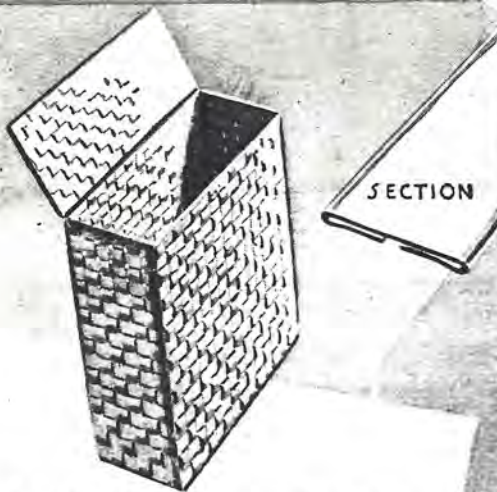
When a kriegie found a nail, he kept it in his watch pocket and took it to bed with him, because it was a precious tool. They had table knives, forks, and spoons, but no pliers, screwdrivers, or hammers. Yet, in addition to doing their own cooking, they had to improvise the utensils.

Their cooking was economical. They saved prune pits, for example, extracted the seeds, and cooked them in margarine to make a dessert. "It tasted like almonds," says Major Orris. Coal was so scarce that they dug up stumps and roots from the prison grounds for fuel, and made "kriegie burners" out of tin cans. These were tiny contraptions that enabled them to get the maximum heat from leaves and twigs.

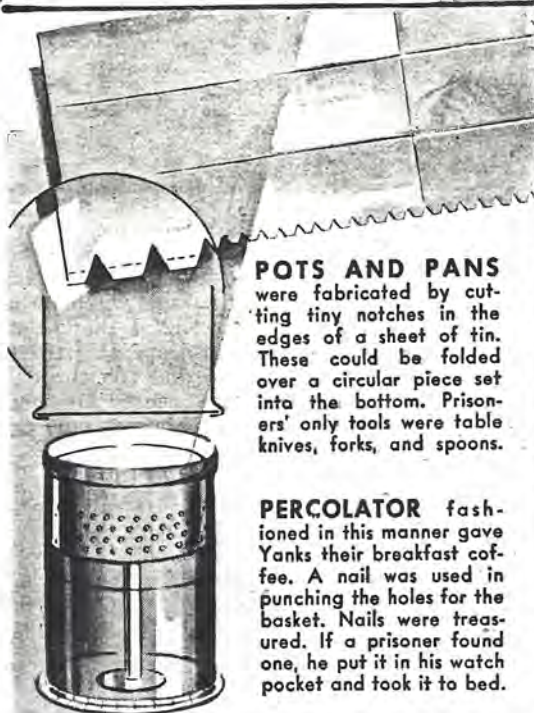
These PW's could not buy anything, but they ran a store where they swapped whatever they happened to have. The storekeepers set point values on everything, and some men soon learned to play the market. When smokes were fairly plentiful, they stocked up with cigarettes, held them until the point value rose, then traded them for soap or whatever else was offered.

Others turned to handicrafts. Some saved metal from the tops of cans, made molds from AAF insignia, and cast new badges for those who had lost the wings from their shirts. A popular variation was an insigne with one wing clipped off and a tiny eight ball hung on a chain in its place.

Some men made knit- (Continued on page 218)



CIGARETTE CASES woven of tin strips were among the fanciest products of kriegie handicraft. Tin was cut into narrow strips, turned over at the edges as seen in the sectional view, and woven.



POTS AND PANS were fabricated by cutting tiny notches in the edges of a sheet of tin. These could be folded over a circular piece set into the bottom. Prisoners' only tools were table knives, forks, and spoons.

PERCOLATOR fashioned in this manner gave Yanks their breakfast coffee. A nail was used in punching the holes for the basket. Nails were treasured. If a prisoner found one, he put it in his watch pocket and took it to bed.

CRACKER MILL provided flour for making pies. Crackers were pressed against a rotating cylinder on which teeth had been raised with a nail. Flour dropped into the bottom section.



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Prison-Camp Ingenuity

(Continued from page 67)

ting needles out of bucket handles, then knit scarfs, sweaters, and gloves, to have something to swap. One man made himself a tin suitcase, and another built a toy steamboat that ran on a spoonful of margarine.

Desperate amusement seekers made kites out of toilet paper, until the Germans declared this sport *verboten*. Then, lying in his bed one day, Major Orris saw a fly come in his window with a glider in tow. It was a tiny piece of paper, folded the way schoolboys fold sheets into toy airplanes, and attached to the fly by a thread. From then on, the imprisoned airmen had glider contests with the flies as tow planes.

During his year in Hitlerland, Orris saw only two movies. One was from Hollywood, "The Male Animal," and the other a propaganda film about the beautiful scenery in Germany. "You can imagine how we felt about *that*," he grins. But the kriegies made a curtain by sewing blankets together and put on stage shows for themselves. A loud-speaker blared German broadcasts at them, and they published two camp newspapers, lettering them by hand and posting them on the wall.

At Christmas, the kriegies scraped wax from the paper wrapped around food and made candles. Major Orris thinned the paint from a box of children's water colors and decorated his window. Soon, nearly all the windows in the camp were gaily painted, but the prisoners got no "bash" (extra big meal) on the holiday.

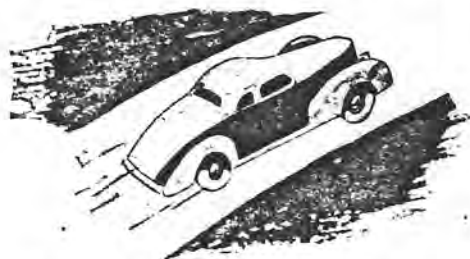
By January, they could hear the guns on the Eastern Front. The camp was near the Oder, and the Russians were coming that way. On an hour's notice, in the middle of the night, the kriegies were marched out into a snowstorm, with the temperature 10 below zero.

All the rest of the night, led by a horse and wagon, they marched three abreast in a column more than a mile long. Trails of blood were left by the bleeding feet of the horses and the guards' dogs. When a plane swooped low as though about to strafe the marchers, some men dived toward the woods, and the guards opened fire on them. Stragglers, whether guards or prisoners, were just left behind. One guard carried his police dog in his arms for warmth; other guards fell in the snow.

Polish women enslaved by the Nazis looked out of a factory window that dawn and wept when they saw the bedraggled, motley line of prisoners tramping down a

(Continued on page 222)

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Prison-Camp Ingenuity

(Continued from page 218)

side road. The men were billeted that day in a barren, dusty room over a pottery works; other days they slept in barns, and once on a woodpile. The snow turned to rain, and the crude sleds on which some of them dragged their packs had to be discarded.

Many had fatigue visions of rosy sunsets, fireworks in the sky, and beautiful green pastures. Eventually they were herded into cattle cars. The 50 men in the car with Orris found they could all lie down at once if they carefully knit their bodies together, and they jolted on across Germany to Nuremberg.

There the weary, underfed, sick, and dirty men were soon covered with vermin and bites, because the cells into which they were dumped had not been cleaned. They received fewer Red Cross parcels, and the soup was often full of weevils. "The more weevils we got," says the Major, "the better we liked it. That was our meat ration." Some of the men became so weak they seldom left their bunks. "They blacked out," Orris explains, "if they stood up quickly."

American planes bombed the big railroad yards just beyond the prison fence. At Sagan, some men had been shot for rushing out and showing enthusiasm during air raids. But here they were allowed to sit on the sandbags and watch the fireworks while the guards ducked into slit trenches.

Major Orris and another kriegie escaped while being marched out of this camp, fled to the woods, built themselves a lean-to, and waited. They were afraid they'd be caught if they moved on—and Patch was coming toward them.

For two weeks they waited, listening to the guns, and living on scraps of food left by German troops who camped near by. They found other escaped prisoners in the woods, and played bridge two evenings with a couple of Englishmen. But the days seemed endless, so they risked moving on toward the northwest—and almost ran into a tank concealed in the brush.

Neither of them had ever seen that kind of a tank, so they supposed it was German and backed away fast. But when they peeked out farther on at an autobahn, they saw a long column of such tanks rumbling toward them—and the faces beneath the helmets of the men on the first tank were black.

"We just about cried," says the Major, "because when we saw that they were Negroes, we knew we were free."