

Harper's readers are familiar with Mr. Walker's articles and the skillful mechanics of the Allied war. He now gives us a look at some of the disconcertingly effective tricks that were hidden up the enemy sleeve.

SECRETS BY THE THOUSANDS

C. Lester Walker

Someone wrote to Wright Field recently, saying he understood this country had got together quite a collection of enemy war secrets, that many were now on public sale, and could he, please, be sent everything on German jet engines. The Air Documents Division of the Army Air Forces answered:

Sorry – but that would be fifty tons.

Moreover, that fifty tons was just a small portion of what is today undoubtedly the biggest collection of captured enemy war secrets ever assembled. If you always thought of war secrets – as who hasn't? – as coming in sixes and sevens, as a few items of information readily handed on to the properly interested authorities, it may interest you to learn that the war secrets in this collection run into the thousands, that the mass of documents is mountainous, and that there was never before been anything quite comparable to it.

The collection is today chiefly in three places: Wright Field (Ohio), the Library of Congress, and the Department of Commerce. Wright Field is working from a documents "mother lode" of fifteen hundred tons. In Washington, the Office of Technical Services (which has absorbed the Office of the Publication Board, the government agency originally set up to handle the collection) reports that tens of thousands of tons of material are involved. It is estimated that over a million separate items must be handled, and that they, very likely, practically all the scientific, industrial and military secrets of Nazi Germany.

One Washington official has called it "the greatest single source of this type of material in the world, the first orderly exploitation of an entire country's brain-power."

How the collection came to be goes back, for beginnings, to one day in 1944 when the Allied Combined Chiefs of Staff set in motion a colossal search for war secrets in occupied German territory. They created a group of military-civilian teams, termed the Joint Intelligence Objectives Committee, which was to follow the invading armies into Germany and uncover all her military, scientific, and industrial secrets for early use against Japan. These teams worked against time to get the most vital information before it was destroyed, and in getting it performed prodigies of ingenuity and tenacity.

At an optical company at Wetzlav, near Frankfurt, for example, the American colonel investigating felt positive that the high executives were holding out on him. But nothing would shake their story: they had given him everything. He returned next day with a legal document which he asked them all to sign. It declared they had turned over "all scientific and trade data; and if not, would accept the consequences." Two days later they glumly signed the document, then led he colonel to a cache in a warehouse wall. From a safe tumbled out the secret file on optical instruments, microscopy, aiming devices.

One two-man search team found itself completely stymied. Records that they had-to find had completely disappeared. A rumor indicated they might have been hidden in a mountain. The two scoured the region in a jeep. Nothing. But keeping at it, they stumbled one day onto a small woods road whose entrance was posted:

Achtung! Minen!

Gingerly, slowly, they inched their jeep in. Nothing happened. But a concrete dugout sunk in the hill revealed another sign: "Opening Will Cause Explosion."

"We tossed a coin," one member of this search team said later, "and the other hitched the jeep tow-rope to the dugout door, held his breath, and stepped on the gas."

There was no explosion. The door ripped from its hinges. The sought-for secret files were inside.

The German Patent Office put some of its most secret patents down a sixteen-hundred-foot mine shaft at Heringen, then piled liquid oxygen, in cylinders, on top of them. When the American Joint Intelligence Objectives team found them, it was doubtful that they could be saved. They were legible, but in such bad shape that a trip to the surface would make them disintegrate. Photo equipment and a crew were therefore lowered into the shaft and a complete microfilm record made of the patents there.

Perhaps one of the most exciting searches was also the grimmest. This was the hunt for hidden documents which might reveal that Nazi scientists had frozen human beings to death and then tried to bring them back to life again. Interviewing four Nazi doctors one day in June 1945, at a laboratory of the Institut für Luftfahrtmedizin, at Gut Hirschau, Bavaria, an American medical corps major, Leo Alexander, was struck with the dreadful conviction, despite repeated denials, that this had occurred.

His suspicions were aroused by three things. All the small animal laboratory equipment was carefully preched; all large-animal equipment destroyed. One of the doctors wanted to dissolve his research institute and dismiss his staff.

And none of the scientists could find any data on human beings at all, not even on those rescued from North Sea waters and saved by the new revival techniques. Did this mean that everything of the sort was hidden away with other data which, the doctors didn't want to show?

Wishing to leave the four Germans in a frame of mind not to destroy their records, the American concealed his suspicions, and, for the time being, transferred his search elsewhere.

Chance suddenly played into his hands. The Allied radio one night broadcast a grim tale of the Dachau concentration camp. Researches on death, and treatment of shock, from exposure to cold had been performed on prisoners. The broadcast named the leading experimenter, one Dr. Rascher, and called him a member of the medical staff of the SS.

For Alexander this was a lead. He happened just to have learned that the American Seventh Army had recently captured a vast mass of especially secret SS records. He therefore headed for the Seventh Army Documents Center to see what was there.

There was more than he anticipated. Even to the complete and final report – Himmler's personal copy, with his green-penciled annotations, all over it – with the names of Rascher and all others involved, and containing all the damning details of the almost unbelievable experiments.

Victims had been immersed naked in ice water until they lost consciousness. All the time elaborate testings were constantly made: rectal, skin, and interior-of-the-stomach temperatures; pulse, blood sugar, blood chlorides, blood count and sedimentation; urine tests; spinal fluid. Appendix 7, Figure 5, showed that seven subjects were chilled to death beyond revival in from fifty-three to one hundred and six minutes.

"This table," Alexander commented in his own report, "is certainly the most laconic confession of seven murders in existence."

It had been with the rest of the documents – in Himmler's private cave in mountain at Hallein. Even though the aide of the mountain had been dynamited down over the cave mouth, the American searchers had found it.

The earliest Joint Intelligence Objectives search teams were followed by others, which were to dig out industrial and scientific secrets in particular. The Technical Industrial Intelligence Committee was one group of these, composed! of three hundred and eighty civilians representing seventeen American industries. Later came the teams of the Office of the Publication Board itself and many now groups direct from private

industry. Of the latter – called, in Germany, Field Intelligence Agencies Technical (FIAT) – there have been over five hundred; of one to ten members each, operating by invitation and under the aegis of the OPB.

Today the search still goes on. The Office of Technical Services has a European staff of four to five hundred. At Hoechst, it has one hundred abstractors who struggle feverishly to keep ahead of the forty OTS document-recording cameras which route to them each month over one hundred thousand feet of microfilm.

What did we find? You'd like some outstanding examples from the war secrets collection?

The head of the communications unit of Technical Industrial Intelligence Branch opened his desk drawer and took out the tiniest vacuum tube I had ever seen. It was about half thumb-size.

Notice it is heavy porcelain – not glass – and thus virtually indestructible. It is a thousand watt – one-tenth the size of similar American tube. Today our manufactured know the secret of making it. . . . And here's something. ...

He pulled some brown, papery-looking ribbon off a spool. It was a quarter-inch wide, with a dull and a shiny side.

"That's Magnetophone tape," he said. "It's plastic, metallized on one side with iron oxide. In Germany that supplanted phonograph recordings. A day's Radio program can be magnetized on one reel. You can demagnetize it, wipe it off and put a new program on at any time. No needle; so absolutely no noise or record wear. An hour-long reel costs fifty cents." He showed me then what had been two of the most closely-guarded, technical secrets of the war: the infra-red device which the Germans invented for seeing at night, and the remarkable diminutive generator which operated it. German cars could drive at any, speed in a total blackout, seeing objects clear as day two hundred meters ahead. Tanks with this device could spot; targets two miles away. As a sniper scope it enabled German riflemen to pick off a man in total blackness.

There was a sighting tube, and a selenium screen out front. The screen caught the incoming infra-red light, which drove electrons from the selenium along the tube to another screen which was electrically charged and fluorescent. A visible image appeared on this screen. Its clearness and its accuracy for aiming purposes were phenomenal. Inside the tube, distortion of the stream of electrons by the earth's magnetism was even allowed for!

The diminutive generator – five inches across – stepped up current from an ordinary flashlight battery to 15,000 volts. It had a walnut-sized motor which spun a rotor at 10,000 rpm – so fast that originally it had destroyed all lubricants with the great amount of ozone it produced. The Germans had developed a new grease: chlorinated paraffin oil. The generator then ran 3,000 hours!

A canvas bag on the sniper's back housed the device. His rifle had two triggers. He pressed one for a few seconds to operate the generator and the scope. Then the other, to kill his man in the dark. "That captured secret," my guide declared, "we first used at Okinawa – to the bewilderment of the Japs."

We got, in addition, among these prize secrets, the technique and the machine for making the world's most remarkable electric condenser. Millions of condensers are essential to the radio and radar industry. Our condensers were always made of metal foil. This one is made of paper, coated with 1/250,000 of an inch of vaporized zinc. Forty per cent smaller, twenty per cent cheaper than our condensers, it is also self-healing. That is, if a breakdown occurs (like a fuse blowing out), the zinc film evaporates, the paper immediately insulates, and the condenser is right again. It keeps on working through multiple breakdowns – at fifty per cent higher voltage than our condensers! To most American radio experts this is magic, double-distilled.

Mica was another thing. None is mined in Germany, so during the war our Signal Corps was mystified. Where was Germany getting it?

One, day certain piece of mica was handed to one of our experts in the U.S. Bureau of Mines for analysis and opinion. "Natural mica," he reported, "and no impurities."

But the mica was synthetic. The Kaiser Wilhelm Institute for Silicate Research had discovered how to make it and – something which had always eluded scientists – in large sheets.

We know now, thanks to FIAT teams, that ingredients of natural mica were melted in crucibles of carbon capable of taking 2,350 degrees of heat, and then – this was the real secret – cooled in a special way. Complete absence of vibration was the first essential. Then two forces directly perpendicular to each other were applied. One, vertically, was a controlled gradient of temperature in the cooling. At right angles to this, horizontally, was introduced a magnetic field. This forced the formation of the crystals in large laminated sheets on that plane.

"You see this . . ." the head of Communications Unit, TIIB, said to me. It was metal, and looked like a complicated doll's house with the roof off. "It is the chassis or frame, for a radio. To make the same thing, Americans would machine cut, hollow, shape, fit – a dozen different processes. This is done on a press in one operation. It is called the 'cold extrusion' process. We do it with some soft, splattery metals. But by this process the Germans do it with cold steel!

Thousands of parts now made as castings or drop forgings or from malleable iron can now be made this way. The production speed increase is a little matter of one thousand per cent."

This one war secret alone, many American steel men believe, will revolutionize dozens of our metal fabrication industries.

In textiles the war secrets collection has produced so many revelations, that American textile men are a little dizzy. There is a German rayon-weaving machine, discovered a year ago by the American 'Knitting Machine' Team, which increases production in relation to floor space by one hundred and fifty percent. Their "Links-Links" loom produces a ladderless, runproof hosiery. New German needle-making machinery, it is thought, will revolutionize that business in both the United Kingdom and the United States. There is a German method for pulling the wool from sheepskins without injury to hide or fiber, by use of an enzyme. Formerly the "puller" – a trade secret – was made from animal pancreas from American packing horses. During the war the Nazis made it from a mold called aspergil paraciticus, which they seeded in bran. It results not only in better wool, but in ten per cent greater yield.

Another discovery was a way to put a crimp in viscose rayon fibers which gives them the appearance, warmth, wear resistance, and reaction-to-dyes of wool. The secret here, our investigators found, was the addition to the cellulose of twenty-five per cent fish protein.

But of all the industrial secrets, perhaps, the biggest windfall came from the laboratories and plants of the great German cartel, I. G. Farbenindustrie. Never before, it is claimed, was there such a store-house of secret information. It covers liquid and solid fuels, metallurgy, synthetic rubber, textiles, chemicals, plastics. drugs, dyes. One American dye authority declares:

It includes the production know-how and the secret formulas for over fifty thousand dyes. Many of them are faster and better than ours. Many are colors we were never able to make. The American dye industry will be advanced at least ten years.

In matters of food, medicine, and branches of the military art the finds of the search teams were no less impressive. And in aeronautics and guided missiles they proved to be downright alarming. One of the food secrets the Nazis had discovered was a way to sterilize fruit juices without heat. The juice was filtered, then cooled, then carbonated and stored under eight atmospheres of carbon-dioxide pressure. Later the carbon-dioxide was removed, the juice passed through another filter – which, this time, germ-proofed it – and then was bottled. Some thing, perhaps, for American canners to think about.

Milk pasteurization by ultra-violet light has always failed in other countries, but the Germans had found how to do it by using light tubes of great length, and simultaneously how to enrich the milk with vitamin D.

At a plant in Kiel, British searchers of the Joint Intelligence Objectives Committee found that cheese was being made – "good quality Hollander and Tilitser" – by a new method at unheard-of speed. "Eighty minutes from the renneting to the hooping of the curd," report the investigators. The cheese industry around the world had never been able to equal that.

Butter (in a creamery near Hamburg) was being produced by something long wished for by American butter makers: a continuous butter making machine. An invention of dairy equipment manufacturers in Stuttgart, it took up less space than American churns and turned out fifteen hundred pounds an hour. The machine was promptly shipped to this country to be tested by the American Butter Institute.

Among other food innovations was a German way of making yeast in almost limitless quantities. The waste sulfite liquor from the beechwood used to manufacture cellulose was treated with an organism known to bacteriologists as *candida arborea* at temperatures higher than ever used in yeast manufacture before. The finished product served as both animal and human food. Its caloric value is four times that of lean meat, and it contains twice as much protein.

The Germans also had developed new methods of preserving food by plastics and new, advanced refrigeration techniques. Refrigeration and air-conditioning on German U-boats had become so efficient that the submarines could travel from Germany to the Pacific, operate there for two months, and then return to Germany without having to take on fresh water for the crew. A secret plastics mixture (among its ingredients were polyvinyl acetate, chalk, and talc) was used to coat bread and cheese. A loaf fresh from the oven was dipped, dried, redipped, then heated half an hour at 285 degrees. It would be unspoiled and good to eat eight months later.

"As for medical secrets in this collection," one Army-surgeon has remarked, "some of them will save American medicine years of research; some of them are revolutionary – like, for instance, the German technique for treatment after prolonged and usually fatal exposure to cold." This discovery – revealed to us by Major Alexander's search already mentioned – reversed everything medical science thought about the subject. In every one of the dread experiments the subjects were most successfully revived, both temporarily and permanently, by immediate immersion in hot water. In two cases of complete standstill of heart and cessation of respiration, a hot bath at 122 degrees brought both subjects back to life. Before our war with Japan ended, this method was adopted as the treatment for use by all American Air-Sea Rescue Services, and it is generally accepted by medicine today.

German medical researchers had discovered a way to produce synthetic blood plasma. Called capain, it was made on a commercial scale and equalled natural plasma, in results. Another discovery was periston, a substitute for the blood liquid. An oxidation production of adrenalin (adrenichrome) was produced in quantity. Successfully only by the Nazis and was used with good results in combating high blood pressure (of which 750,000 persons die annually in the United States). Today we have the secret of manufacture and considerable supply.

Likewise of great importance medically were certain researches by Dr. Boris Rojewsky of the Kaiser Wilhelm Institute of Biophysics at Frankfurt. These were on the ionization of air as related to health. Positively ionized air was discovered to have deleterious effects upon human well-being, and to account for the discomfort and depression felt at times when the barometer is falling. In many persons, it was found, its presence brought on asthma, hay fever, and nervous tension. It raised high blood pressure, sometimes to the danger point. It would bring on the symptoms common in mountain sickness-labored and rapid breathing, dizziness, fatigue, sleepiness.

Negatively ionized air, however, did all the opposite. It was exhilarating, creating a feeling of high spirits and well-being. Mental depression was wiped out by it. In pathological cases it steadied breathing, reduced high blood pressure, was a check on allergies and asthma. The importance of its presence wherever human beings live, work, or recuperate from illness may some day make its production one of the major functions of air conditioning.

But of highest significance for the future were the Nazi secrets in aviation and in various types of missiles.

"The V2 rocket, which bombed London," an Army Air Force publication reports, "was just a toy compared to what the Germans had up their sleeve."

When the war ended, we now know, they had 138 types of guided missiles in various stages of production or development, using every known kind of remote control and fuse: radio, radar, wire, continuous wave, acoustics, infra-red, light beams, and magnetics, to name some; and for power, all methods of jet propulsion for either subsonic or supersonic speeds. Jet propulsion had even been applied to helicopter flight. The fuel was piped to combustion chambers at the rotor blade tips, where it exploded, whirling the blades around like a lawn sprinkler or pinwheel. As for rocket propulsion, their A-4 rocket, which was just getting into large scale production when the war ended, was forty-six feet long, weighed over 24,000 pounds, and traveled 230 miles. It rose sixty miles above the earth and had a maximum speed of 3,735 miles an hour – three times that of the earth's rotation at the equator. The secret of its supersonic speed, we know today, lay in its rocket motor which used liquid oxygen and alcohol for fuel. It was either radio controlled or self-guided to its target by gyroscopic means. Since its speed was supersonic, it could not be heard before it struck.

Another German rocket which was coming along was the A-9. This was bigger still – 29,000 pounds – and had wings which gave it a flying range of 3,000 miles. It was manufactured at the famous Peenemünde army experiment station and achieved the unbelievable speed of 5,870 miles an hour.

A long range rocket-motored bomber which, the war documents indicate, was never completed merely because of the war's quick ending, would have been capable of flight from Germany to New York in forty minutes. Pilot-guided from a pressurized cabin, it would have flown at an altitude of 154 miles. Launching was to be by catapult at 500 miles an hour, and the ship would rise to its maximum altitude in as short a time as four minutes. There, fuel exhausted, it would glide through the outer atmosphere, bearing down on its target. With one hundred bombers of this type the Germans hoped to destroy any city on earth in a few days operations.

Little wonder, then, that today Army Air Force experts declare publicly that in rocket power and guided missiles the Nazis were ahead of us by at least ten years.

The Germans even had devices ready which would take care of pilots forced to leave supersonic planes in flight. Normally a pilot who stuck his head out at such speeds would have it shorn off. His parachute on opening would burst in space. To prevent these calamitous happenings an ejector seat had been invented which flung the pilot clear instantaneously. His chute was already burst, that is, made of latticed ribbons which checked his fall only after the down-drag of his weight began to close its holes.

A Nazi variation of the guided air missile was a torpedo for underwater work which went unerringly to its mark, drawn by the propeller sound of the victim ship from as far away as ten miles. This missile swam thirty feet below the water, at forty miles an hour, and left no wake. When directly under its target, it exploded.

All such revelations naturally raise the question: was Germany so far advanced in air, rocket, and missile research that, given a little more time, she might have won the war? Her war secrets, as now disclosed, would seem to indicate that possibility. And the Deputy Commanding General of Army Air Forces Intelligence, Air Technical Service Command, has told the Society of Aeronautical Engineers within the past few months:

The Germans were preparing rocket surprises for the whole world in general and England in particular which would have, it is believed, changed the course of the war if the invasion had been postponed for so short a time as half a year.

For the release and dissemination of all these one-time secrets the Office of the Publication Board was established by an order of President Truman within ten days after Japan surrendered. The order directed that not only enemy war secrets should be published, but also (with some exceptions) all American secrets, scientific and technical, of all government war boards. (The Office of Scientific Research and Development,

the National Research Council, and other such.) And thereby was created what is being termed now the biggest publishing problem a government agency ever had to handle.

For the war secrets, which conventionally used to be counted in scores, will run to three-quarters of a million separate documentary items (two-thirds of them on aeronautics) and will require several years and several hundreds of people to screen and prepare them for wide public use.

Today translators and abstracters of the Office of Technical Services, successor to the OPB, are processing them at the rate of about a thousand a week. Indexing and cataloguing the part of the collection which will be permanently kept may require more than two millions cards; and at Wright Field the task is so complicated that electric punch-card machines are to be installed. A whole new glossary of German-English terms has had to be compiled – something like forty thousand words on new technical and scientific items.

With so many documents, it has, of course, been impossible because of time and money limitations to reprint or reproduce more than a very few. To tell the public what is available, therefore, the OTS issues a bibliography weekly. This contains the newest war secrets information as released – with titles, prices of copies currently available or to be made up, and an abstract of contents.

The original document, or the microfilm copy, is then generally sent to the Library of Congress, which is now the greatest depository. To make them more easily accessible to the public, the Library sends copies, when enough are available, to about 125 so-called "depository" libraries throughout the United States.

And is the public doing anything with these one-time war secrets? It is – it is eating them up. As many as twenty thousand orders have been filled in a month, and the order rate is now a thousand items a day. Scientists and engineers declare that the information is "cutting years from the time we would devote to problems already scientifically investigated." And American business men...! A run through the Publication Board's letters file shows the following;

The Bendix Company in South Bend, Indiana, writes for a German patent on the record player changer "with records stacked above the turntable." Pillsbury Mills wants to have what is available on German flour and bread production methods. Kendall Manufacturing Company ("Soapine") wants insect repellent compounds. Pioneer Hi-Bred Corn Company, Iowa, asks about "interrogation of research workers at the agricultural high school at Hohenheim." Pacific Mills requests I. G. Farbenindustrie's water-repellent, crease-resistant finish for spun rayon. The Polaroid Company would like something on "the status of exploitation of photography and optics in Germany." (There are, incidentally, ten to twenty thousand German patents yet to be screened.)

The most insatiable customer is Amtorg, the Soviet Union's foreign trade organization. One of its representatives walked into the Publication Board office with the bibliography-in hand and said, "I want copies of everything." The Russians sent one order in May for \$5,594.00 worth – two thousand separate war secrets reports. In general, they buy every report issued. Americans, too, think there is extraordinarily good prospecting in the war secrets lode. Company executives practically park on the OTS's front doorstep, wanting to be first to get hold of a particular report on publication. Some information is so valuable that to get it a single day ahead of a competitor, may be worth thousands of dollars. But the OTS takes elaborate precautions to be sure that no report is ever available to anyone before general public release.

After a certain American aircraft company had ordered a particular captured war document, it was queried as to whether the information therein had made it or saved it any money. The cost of the report had been a few dollars. The company answered: "Yea – at least a hundred thousand dollars."

A research head of another business firm took notes for three hours in the OTS offices one day. "Thanks very much," he said, as he stood to go, "the notes from these documents are worth at least half a million dollars to my company."

And after seeing the complete report the German synthetic fiber industry, one American manufacturer remarked:

This report would be worth twenty million dollars to my company if it could have it exclusively.

Of course you, and anybody else, can now have it, and lots of other once secret information, for a few dollars. All the war secrets, as released, are completely in the public domain.