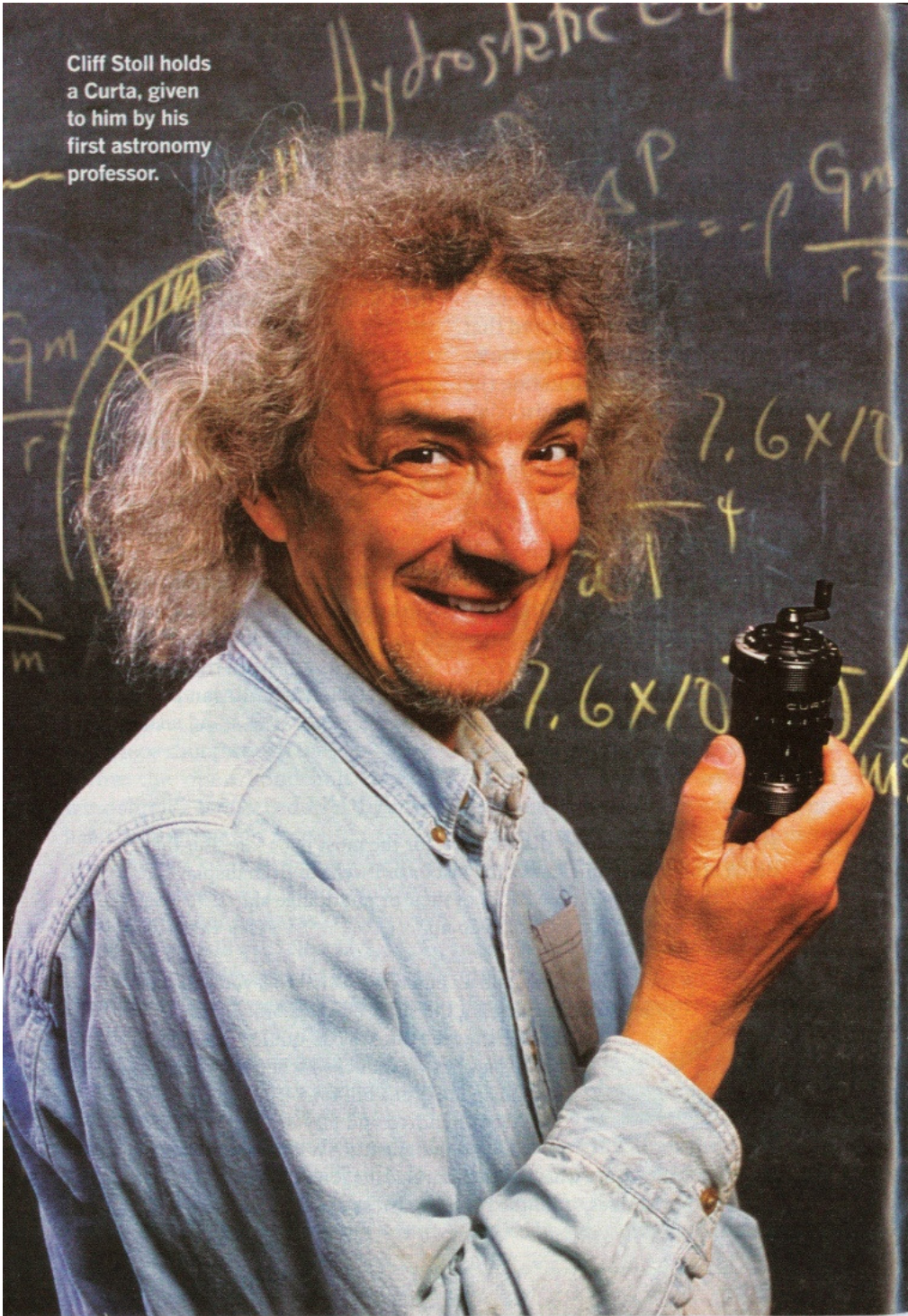


Cliff Stoll holds a Curta, given to him by his first astronomy professor.



# CRUNCHING numbers

the curious history of the world's  
first pocket calculator

BY CLIFF STOLL FROM SCIENTIFIC AMERICAN

I AM HOLDING what looks like a pepper grinder. It's a device that does everything your \$10 pocket calculator can do, except that it's entirely mechanical—no battery, no keypad, no liquid-crystal display. You turn a crank to add numbers.

A windup adding machine? You bet. To add or subtract, I enter numbers with sliders and spin the crank; the result appears in windows circling the top. I'm literally crunching numbers.

And, yes, it multiplies and divides. While there's no on/off switch, a handy finger ring clears the memory.

What's most astonishing is that this device arose from the nadir of civilization, the Buchenwald concentration camp, and the imagination of Curt Herzstark.

BORN IN 1902, in Vienna, Herzstark grew up around the family business of selling calculators. By the 1930s the calculator business was booming. "But something was missing in the world market," Herzstark later recalled. "Wherever I went, competitors came with wonderful, expensive, big machines. I'd talk with a building foreman, an architect or a customs officer who'd tell me, 'I need a machine that fits in my pocket and can calculate. I can't travel 10 kilometers to the office just to add a row of numbers.'"

Herzstark, then in his 30s, began designing a mechanism with the customer's needs in mind. He decided to wrap sliders around a cylinder so you could hold it in one hand and enter numbers with the other.

PHOTOGRAPHED BY ERIK BUTLER

By late 1937 Herzstark was ready to build his handheld calculator. Then came Hitler.

In March 1938 the German army entered Austria. As the son of a Catholic mother and a Jewish father, Herzstark faced trouble.

German military officers arrived to inspect the family's factory. After a one-sided negotiation, the factory was forced to begin producing gauges for panzer tanks.

Things remained relatively stable for a few years. "But in 1943," Herzstark said, "two people from our factory were arrested. They had listened to English radio stations and transcribed the broadcasts on a typewriter. The owner was one of our mechanics. He was beheaded. The second one was imprisoned for life. I tried to intervene for them with the Gestapo. The officer threw me out, saying, 'What impudence, that a half-Jew dares to speak on behalf of these people!'

"I was invited to testify for 'these people' and arrested—nice, no? My house was searched, and, of course, I never had a trial. I was accused of supporting Jews, aggravation, and having an erotic relationship with an Aryan woman. All fabricated crimes."

The SS threw him into the infamous Pankraz prison, where torture of Jews was routine. Then he was sent to



The precision of a Swiss watch, the craftsmanship of an old Nikon F camera and the elegance of a tango—all in a compact cylinder.

Buchenwald. "Spiritually at zero, I thought, I have to die."

Alongside Buchenwald, though, the Nazis had built a slave-labor factory to make machinery for secret military projects. The managing engineer placed Herzstark in charge of precision parts to be shipped to a launch site for ballistic missiles.

Eventually Herzstark's dream project came to the attention of the managing engineer. He took Herzstark aside and said, "I understand you've been working on a small calculating machine. We will allow you to make and draw everything. If it really functions, we will give it to the *Führer* as a present after we win the war. Then, surely, you will be made an Aryan."

"I worked on the invention Sunday mornings and in the evenings after lights out. I worked in the prison, the workroom and where we ate. I drew up the machine in pencil, complete with dimensions and tolerances."

Herzstark had pretty much completed his drawings on April 11, 1945, when he saw jeeps coming from the north. An American soldier in the front seat called out, "You're all free."

Looking back, Herzstark said simply, "If I'd been a lawyer or something, I would have died miserably. God and my profession helped me."

A FEW DAYS AFTER the Americans liberated Buchenwald, Herzstark walked to the city of Weimar, to one of the few factories still standing, with his plans folded in his pocket. Herzstark's designs were so clear that it took the machinists only two months to make three prototype calculators.

But just as contracts were being drawn up, the Russian army arrived. Herzstark knew the score: He grabbed the prototypes and headed for Vienna, taking the machines apart and putting the pieces in a box. "If someone had looked in, it was like a toy," he said.

He traveled to Austria by walking and bartering cigarettes for train rides. With nothing but his three models, Herzstark filed for patents and tried to get someone to invest in his idea. There were no takers, except for the prince of Liechtenstein.

All went well at first. Liechtenstein created a company, Contina, and then floated loans and issued stock. Herzstark served as technical director and was promised 35 percent of the stock.

The first Curta calculators went on sale in 1948. Contina expanded from a

rented hotel ballroom to a proper factory, ramping up production to several hundred per month. But with this progress, the financiers pulled the rug out from under Herzstark—reorganizing the firm and annulling his stock.

The patents were still in Herzstark's name, so he was able to force the financiers to come to terms. Contina paid him \$562,308 in today's dollars, plus royalties, for his patents. Throughout the 1950s and 1960s, he actually made money from his invention.

Just as Herzstark had predicted, engineers used the miracle machines to find satellite orbits, surveyors to keep track of transit positions, and traveling accountants to balance books down to the penny.

Ultimately electronic calculators eclipsed Herzstark's invention. After a run of 150,000, the last Curta calculator was sold in the early 1970s.

AS I HOLD Herzstark's Lilliputian calculator, I realize this odd, finger-friendly cylinder is both mechanically elegant and certain. After all these years, it still purrs as I do the numbers.

#### THE FACE ISN'T FAMILIAR, BUT THE NAGGING RINGS A BELL



I accompanied my husband to a reunion of friends he hadn't seen in more than 40 years. As we stood at the entrance to our host's house, Barrie searched for a familiar face. Finally spotting one, he went over, stuck out his hand and asked, "And you are ...?"

The woman glared at him before responding, "Your first wife."

ADRIEN TYLOR