Hornets' nest

For around the thousandth time since leaving the house, the young man felt for the shiny new ultra-intelligent-machine (UIM) pendant round his neck. Third generation — same technology, they had told him, as the unit now directing operation MOP

The pendant was a going-away present from his parents, and now Mark was heading downtown for a goodbye drink with some friends. He was early, but he didn't mind, he could use the time to think things over. Events had moved so fast in the last few months; it seemed like he'd just left college and tomorrow he was off to join the project team. Just at the right time, too. The Mars Oxygenation Programme, the big project of the decade, had been something of a sick joke until recently, but the latest news was that things were really moving now, thanks to the new director.

This thought sent his hand straying towards the pendant again, as he pushed open the barroom door. Whether he was just making sure it was still there or clutching it as a lucky talisman, no-one, not even he, could say — it just felt good to know it was there.

"Mind it don't bite you, sonny". He looked round sharply, grinned in response to the open, friendly smile from the old-timer who had spoken. The leathery face assumed a serious look as the man spoke again: "That's a mighty fine gadget, boy. A mite tidier than the first of them, way back in '83".

Mark looked with a new respect into those deep, piercing eyes, eyes which he suddenly realised, must have spent more hours prising secrets from glowing VDU screens and fathoming the intricacies of hand-soldered circuit boards than he would care to guess. Never before had he met one of the now almost legendary Silicon Valley prospectors.

The so-called prospectors had had their heyday in the '70s and '80s, when the rush to exploit the micro explosion was closely akin to the gold rush of a century or so before. Pioneers and visionaries, their uncanny talents for making microprocessors sing and dance or anything else that was useful or profitable — preferably both — were much in demand. Until, that is, the big business combines stepped in and everything became much more organised and much less exciting. Yet developments were still accelerating, and there were stories.

Mark hadn't missed the cue in the other's last comment. Sensing a story, he returned the response clearly expected of him: "How do you mean, back in '83? It's well known that the first of the ultra-intelligent machines was Randolph's system, just after the turn of the millenium. It wasn't until '88 that the first system was generally accepted to have passed the Turing test for a thinking machine, and it was another 15 years before Paul Randolph coaxed such a system to produce the design for the first-generation UIMs. They produced the second generation just eight years ago and they were responsible for —", and he

by

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glanced down at his pendant, embarrassed suddenly by his schoolboyish enthusiasm

The oldster smiled. "You learned your lessons well, boy, but they don't tell you everything at school In college they tell you a lot about Babbage and Hollerith, and fill your head with facts and figures about ACE and ENIAC, but they leave out the in-between years — the most interesting years, I reckon. They can't make you feel the heat, the smell, the taste of the atmosphere between those racks of valves; I was just a kid then, but I'll never forget".

He paused, sipped his beer. "By the time I left school, we were into the second generation, and the field was wide-open. If you could spot a dud nickel delay line, or code a neat set of input/output routines, you could write your own ticket.

"Of course, when IBM produced 360s, then the 370s with their megabyte main-store and nanosecond cycle times, everyone said it was all up for the seat-of-the-pants programmers Anyone with a Fortran or Cobol course behind them — they taught you about programming languages, didn't they? — could do anything they wanted as quick as it was needed, and even flowchart it in a way that everyone could understand. I got a nice little number with a communications firm, doing work on CAD and control systems. I was just having some interesting results from the gadgets I'd hooked up when the micro started to make a splash, back in the mid-70s

"Well, I could see the way the world was turning and I lashed out on as much of the stuff as I could. Soon, I'd wired together my own little multiprocessor set up, and I was adding to it every week. After a while, I looked round and found a few others who were interested, and we formed a kind of club. We'd meet at my place, some of them would bring systems they had put together, and we would trade ideas

"There was a kid, about your age; no hardware of his own but, boy, there wasn't much he couldn't make a system do. Used to tap away at my set-up for hours, all night sometimes; didn't seem to have any other interests, nor any friends either, except us I suppose. I worried about that kid — just didn't seem healthy somehow.

"We had been going about five years, must have been '81, when a new gent' joined our club. I say gent' because he didn t seem our type at all, always wore a suit and tie and talked about micro-electronics like he'd just learnt it from a textbook. Turned out later that he had; he was a director for one of the big automobile firms".

At this point the man paused, as if startled at the revelation, and Mark took the opportunity to top up the glasses.

"Thanks, son. Well, as I was saying, it seems the automobile giants were worried It was just before the petroleum synthesis process was perfected and it looked like the internal combustion engine was a dying breed. This gent's firm was diversifying, putting its capital into other profitable enterprises, and they had recently bought one of the biggest silicon chip producers in the States. This director was, so to speak, a talent scout for the firm, and he was impressed by the things we were doing So much so, that he offered the kid and me key posts in a hush-hush project they were starting.

"Like everyone else, they were on the

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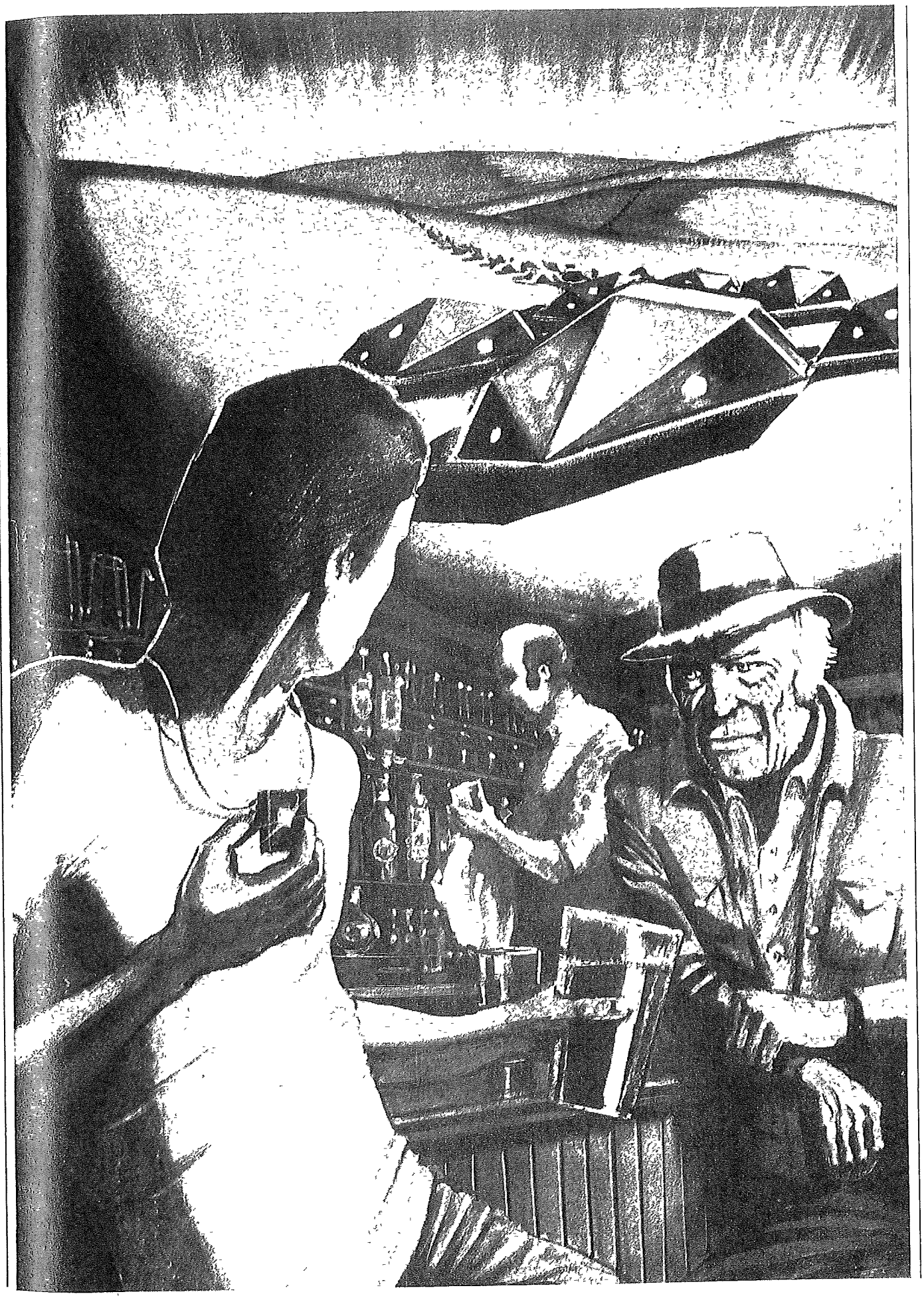

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artificial intelligence kick, and had this big idea about machines building cleverer machines. The only difference was, they had the cash to back their big ideas. They already had a new site in the sticks, on the edge of the Colorado Desert; production lines set to roll off any design of chip you cared to ask for — all we had to do was to hook up a system that would design the new chips and control production.

"I was taken on as systems analyst, and when I heard what the system had to do, I insisted on taking the kid along to do the programming. They wanted to bring in a team of programmers, but this had to be a one-man job if we were going to succeed. The job specification was concise: rig-up a system that would turn out the most advanced processor possible, using all the CPUs, memory and backing store we wanted.

"Setting-up the database was a big job, of course; quite a lot of the scientific data we wanted still wasn't on chip at the time, and we had to set-up a text-reader to input nearly a library-full of science texts and formulae into the data banks. I figured any system aiming to design new circuits would have to be strong on electro-magnetic field theory, so we piled in everything we could find on that. Seems unfair how you can get into such a heap of trouble just by being right.

"The other smart-Alec was one of the company directors. Reckon he was a sci-fi fan — had some scary ideas about machine intelligence and insisted we built Asimov's first law of robotics into the system. You know the deal"?

The younger man nodded and intoned, almost reverentially: "No robot can harm a human being, or, through inaction, allow a human being to come to harm". Mark, too, was a sci-fi fan, and to him Asimov was the Old Master.

"Yeah, that's it". The other sounded less enchanted, for some reason. "Well, that gave the kid some problems in his programming, I can tell you. It also meant we had to add a whole stack of human psychology and sociology journals to the data input, so the system would know about human behaviour. Mind you, that was nothing to the problems it landed us in later — friend Asimov has plenty to answer for.

"Well, I rigged up the sweetest little 12-processor system you ever did see, though I do say so myself. About five gigabytes of backing store, and direct control of the processing plant. As an afterthought, I linked in another CPU, out of phase with the others, to cut-in between cycles and check they were all OK; any CPU that went down would be switched out of the system automatically. Some say that was the unlucky move, adding the 13th processor, but I ain't superstitious.

"I didn't see anything of the kid for months. Sometimes when I looked in on him he'd be working through a mile or two of program listing, else he'd be tapping away at his terminal, or putting a subroutine through its paces. He had his meals brought in to him, and even slept on a camp bed he had brought in. Didn't seem bothered about social niceties, either — you know, washing, shaving, changing his clothes — details like that. Visitors always left quickly — I think that suited him. Like I said before, there was something about that kid that wasn't healthy, and I don't just mean the smell.

"You know, the more I tell this story, the more I wonder. How could I have not seen it coming? Perhaps I was just too busy — perhaps I was just too dumb.

"Anyway, one day the kid wandered casually into my office, mentioned that the system was up and running, left and crashed out on his camp bed for 24 hours. It took me a few minutes to realise what he meant. I rushed out to the production lines to see. Nothing, of course. The system was chewing over all the facts and figures and formulae we had given it, and it was going to be some hours at least before it started spewing out the bright new future we were hoping for, in the shape of some super-powerful chip.

"Two days later, still nothing happening, I was getting worried. The kid, who by this time had even washed and shaved, tapped away at his monitor and told me confidently it was all OK Apparently the system was referencing data on optimisation techniques; he figured it must have worked-out the circuit it wanted and was deciding on the best way of laying it. I was whacked — I'd been up for the last 48 hours — so I left him watching the show and went for some sleep".

The old-timer paused, stared reflectively into his glass for a few moments. Then he spoke again, more to himself than to Mark, as if the other's presence no longer mattered.

"I don't know how long I slept, but I woke up with one of the technicians shaking the living daylights out of me. He didn't say a word, just stepped across and pulled open the curtains, then waited for me to come and look

"My first impression was that we were being invaded. A column of insects, soldier ants or locusts maybe, was heading into the complex from out in the desert, as far as the eye could see. Then I realised my mistake — the column was moving, slowly but steadily, away from the complex. Something was heading out of our production plant at the rate of thousands an hour, and had been for quite a few hours, by the looks of it.

"In the 10 seconds it took me to dress and get down there, the technician told me that the plant had started in the middle of the night. The products were unusual, but they'd decided to turn in and leave it until I woke to study them — nothing odd was gong on then.

"Down on the sand, I watched them creeping out under one of the cargo doors. Not ants or locusts, more like beetles, Colorado beetles perhaps; brownish, with gold spots all over. I picked one up; it was shaped like a beetle, too — kind of oval, but with flat surfaces all round it and at the ends. The gold spots were on the flats, some sort of contacts, I suppose. I put it down, and it moved off again, same direction, same speed as all the others. We figured later that they all had a kind of linear motor built in, and were dragging themselves along the earth's magnetic field lines. You know, like the monorail systems, a kind of magnetic induction process. Very efficient, and no moving parts.

"Well, of course, we shut the plant down. Any fool could see that the system had gone a bit neurotic — leastways, that is what this particular fool figured. The kid settled back to his monitor to try and debug the system, while I took a team out to debug the desert — literally.

"Two technicians had been out in a jeep to see where our bugs were heading, and they came back with a report that they were all piling up at a spot about three miles out, like some massive seething antheap. All we had to do was to get out there, wait till they all arrived, then shovel them into the back of a truck. On impulse, I took a few instruments out with us. I had a theory.

"I don't know how many there were in that pile, must've been thirty or forty thousand, and more arriving by the minute I set-up my instruments as close to the pile as possible, and quickly confirmed my guess: this spot in the desert was a node in the earth's magnetic field, a kind of magnetic powerhouse. I was just congratulating myself on figuring this irrelevant detail when, all of a sudden, the lights went out. In the middle of the desert, mid-morning, it just went black. I stumbled around, tripped over my instruments, then hit a rock about four foot high But there were no rocks here. I backed off, that heap of bugs had suddenly set rock-solid.

"I heard people calling me, and ran towards the voices. Suddenly I was in blazing sunlight again, with the others just a few feet away. I looked back the way I had just come and saw nothing. Nothing but sand, and sky, and the stream of bugs from the plant, now disappearing as soon as they hit a certain point on the sand. The technicians told me I had suddenly disappeared, along with the heap of bugs, then just as suddenly stepped out from nowhere in front of them. I told them about the dark, and waved my arm back

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the way I'd just come — my arm disappeared. I pulled it back, stepped carefully in that direction. The technicians gasped — seems I had disappeared again — and I was back in the black.

"Electro-magnetic wave distortion — the old sci-fi invisibility field. So simple, just bend the light rays round whatever you want to hide, and you see past it, or through it as if it were not even there. Our heap of bugs was the first brain to overcome the technical problems and make it happen.

"We wasted about 10 minutes pacing out the size of the distortion field — walking in what looked like straight lines, but weren't — before it occurred to me to wonder just why our brainchild wanted to hide itself. We laid out some markers for the bombers — I was beginning to think at last — then piled into the truck. It only took us 10 seconds to confirm that the truck's electrics were dead, and figure where the blame lay As we ran back to the complex I crossed-off mentally aircraft and guided weapons from my list of possibilities, and cursed myself for a fool for giving the monster such a thorough education.

"I was the last back, and I found the technicians with a group of workers, watching weird patterns drifting across one of the system's monitors which were dotted round the place. I turned away, and yelled at them to do the same, but I was too late. I went looking for the kid, and found him tapping away at his console while those patterns flickered across his VDU. He was keying in the parameters to re-start the system That heap sure had everything under control — everything except me. I pulled off my shoe and knocked him cold, then I pulled the plug on that screen. While he came round, I disconnected all the other VDUs, though it didn't seem to do much for the zombies standing round them.

"The kid seemed none the worse for wear, apart from a lump on the head. I cut short his questions about the system, and asked for some straight answers to some very personal questions. I asked him about his childhood, his family, his friends, regular headshrinker stuff He squirmed, it wasn't easy for him, but there were things I had to know.

"At last I had it. The kid had a standard set of hang-ups, was no more or less neurotic than your average introvert, but he majored on the theme of mankind being man's worst enemy, man needing protection from himself. That idea was bound to carry over, subconsciously, into a program as complex as ours. Any superbrain with Asimov's first law built in had to disable man's worst enemy — harmlessly, of course.

"Our heap of bugs wasn't nuts. It was terrifyingly sane

"There wasn't much time, it was sure to try and regain control somehow. There was no way of knowing how far afield it was interfering with TV broadcasts, taking over unsuspecting viewers, or what other tricks it had up its junctions. I told the kid the data modifications I wanted, and he keyed them in from his terminal, blind, with the screen covered over Then he started the program again, from a re-start point shortly before the production routine, so it would refer to the new data before it set up the next production run. We sat back and waited.

"Four hours later the exodus began again, little electronic Colorado beetles creeping out to their rendezvous with nothingness. After another four hours I started switching-in one of the system monitors every 10 minutes, just for a few seconds. On the ninth try, the screen was clear. We drove out to the abandoned truck with a spare battery, and it started, no trouble. There was still no sign of the heap, and those new bugs were disappearing at steady rate".

Up to this point, Mark had listened, fascinated, but now he felt he must query what seemed to be an inconsistency. "Surely, if you had corrupted the database, the new chips would be faulty", he objected. "Wouldn't your bugheap, as you call it, simply have rejected them"?

The older man nodded. "That's true, son, it would, if my modifications had been out of line with the original data — but it wasn't.

"You see, boy, I wasn't the first one with bug problems. Middle of the last century, scientists controlled some types of insect pests effectively by sneaking large numbers of strong males, radiation-sterilised, into a swarm These fellas came on strong with the lady bugs, making sure a whole load of the eggs never hatched Wasn't long before the swarm dwindled and died away

"My new chips were the sterile males for the bugheap. They were accepted because their data was consistent with the original chips"

"But what mod' did you make, to have that effect"? asked Mark. "Surely not just the old tie-the-computer-up-with-a-paradox routine"?

"Well, I suppose it was a kind of paradox, but I didn't see it like that. Not the type you mean — the statement I am now making is not true — or some such. I've never yet met a computer that became knotted-up in words the way we seem to No, I simply added to its logic design data the fact that the original system had been designed, programmed and provided with data by humans. As I saw it, our only hope was if the new bugs carried that fact, in some shape or form, out to the heap".

Mark looked puzzled for about a minute, then smiled. "Clever, but how did you know it would work"?

"I didn't, but when it let go the monitors, I knew we had got through to it. The way I figure, it withdrew while it considered this fact that it was a product of man's worst enemy, so it might actually be a weapon without realising it, aimed at those it was trying to protect. Far as I know, it's still considering".

Mark gasped: "You mean it's still out there"?

"Well, I ain't moved it, son. You'll never find it, though, unless you walk straight into it. Don't look so worried, it's not done anything for a good few years, don't reckon it's fixing to start now.

"The workers came round in 48 hours. So did all the others — local news said nearly every man, woman and child in an 80-mile zone had suffered a mysterious blackout. We never let on why — serves them right for watching so much TV.

"The auto bosses dismantled the plant, of course. Blamed us for wasting millions of their capital, and gave us the sack They never discovered exactly what happened — the workers couldn't remember a thing, and we weren't set to tell them — they had enough to worry about keeping their investors happy.

"Well, boy, wouldn't you agree that our heap qualifies as the first of them ultra-intelligent machines? No, don't feel obliged to answer, I can see you have your doubts about my story. Reckon you'll be convinced soon, though, when your new director up on Mars starts thinking about those tracks up there they keep calling canals. I don't reckon that new machine will take long to figure it out. I just wish I'd been up there to help them when their systems cut loose, that's all. Well, 'bye son, good luck Thanks for the drinks"

Mark had glanced down in embarrassment a moment before, but now his thoughts were in a turmoil. How did this man know where he was heading? Was he implying what he seemed to be implying? Mark looked-up, his mind full of questions, but only the swinging bar-room door marked the man's exit. From the door, there was no sign of him, up or down the street

Mark raced to the bar. "Who was that man? Where does he live? What does he do"?

The bartender shrugged. "Old Jed? Oh, he's just some hillbilly lives out in the woods Comes into town regular to pick up packages from the post office — electrical bits and such like, mostly Some say he's got a still out in the woods, fixing moonshine. Few times folks been out looking for his place. Always come back saying they found themselves going back the way they came Reckon they must have stopped off and sampled his produce"

The bartender grinned at his own joke, and turned back to wiping glasses