The Embedding, by Ian Watson

Experiment sections

"Chris, there's something I wanted to ask you. You can finish reading the letter later on."
"What?"
"Nothing very important, I don't suppose. Only, I was talking to one of the village women whose husband does gardening at the Hospital. She said something odd—"
"Yes?"
"That you're teaching the children there bad language."
Shock.
"Bad language? What does she mean? Doesn't she know it's a hospital for kids who can't speak properly—who've suffered brain damage? Of course they speak bad language."
Glancing at the paragraphs he'd just read, he found himself assaulted by certain phrases that would not leave him alone.
Such as 'human zoo' and 'political project'.
The words had a faint aura round them on the paper— they blurred into a fog as though his brain was reluctant to process them. But wouldn't disappear. Their very indistinctness irritated him, brought them nagging to his attention. Perhaps rain had dripped on to the paper while Pierre was writing, smearing these particular words before they had a chance to dry.
Eileen was watching her husband calmly.
"I know what the Unit's supposed to be doing. That's what I told her, what you've just said to me. But you know how these country wives go all mysterious and confidential. She knew the Hospital was up to something else, she said—something secret and shameful. And what it was, was teaching children bad language—"
"So what does she mean by bad language then? What's her definition?" he demanded.
"I said about the brain damage and speech defects," she shrugged, "but that wasn't what she meant."
Sole drank some coffee swiftly, scalding his mouth, and laughed.
"I wonder what the poor gossipy bitch thinks we're up to? Teaching the kids to lisp out 'fuck' and 'bugger'?"
"No, Chris, I don't feel she was talking about 'fuck' and 'bugger'."
The Victorian wrought-iron pub table by the window was piled with spice jars and cook books —it had cost twenty pounds at an auction and they'd painted it white together when she was five a glass of beer maybe and steering the child's early efforts at speech.
"The gardener's wife! It's just a bit of nonsense."
But Eileen persisted, touching Peter anxiously as though the boy was threatened by events at the Hospital.
"You used to talk to Pierre about bad language. You didn't mean swearing then. You meant *wrong* languages."
"Listen Eileen, a child speaks bad language when its brain's damaged. It has difficulties—has to be taught by roundabout routes."
"She also said—"
"Yes?"
"There's a front and a back to the Hospital. The real work goes on in special rooms you can't get into without a pass. And it isn't curing the children at all but making them sick. That's where

the bad language comes in. Or do I say bad languages, plural? Is that more accurate, Chris? What *is* going on at the Unit? Is it despicable—or something I can admire?"
"Damn it, the woman's just describing any hospital! There are always closed wards."
"But it isn't a mental hospital."
Sole shrugged, noticed the blue ghost of a 'human zoo' trying to catch his eye.
"Any hospital dealing with damaged brains is a kind of mental hospital at the same time as it's a physical hospital. You can't draw a line between the two. Language is a mental thing. Damn it, they hired a linguist in me, not a doctor."
"So they did."
So difficult to imagine the otherness of another person. Yet wasn't that his own task at the Hospital—to *create* otherness? Oh Vidya, and all you others: will you really tell us so much about what humanity is, through our little act of inhumanity?
Inevitable that somebody somewhere should try out this set of experiments sooner or later. It had cropped up in the literature for years. The yearning to try it out became a kind of pornography after a while, a sort of scientific masturbation. To raise children in isolation speaking specially designed languages.
Paper streamers crisscrossed the corridors and hallway. Balloons, pinned over doorways, seemed to summon different kinds of attention. Blue attention. Green attention. Red attention. Different areas of the injured brain blowing empty speech bubbles.
What would the bubbles be filled with?
Accusations? Or the key to reality? The E=MC2 of the mind?
The spring door locked behind him automatically. There was a short corridor with a second door at the end of it. He chose a second key, unlocked the door and walked through into the rear wing, where fir branches reached out to brush the windows. A corridor ran right round the outside of the wing.
The window glass bore a fine mesh of wires within it, low voltage electrified, computer monitored as part of the alarm system.
To look down from the upper windows of the manor house on to this rear wing would show you great opaque skylights that lit the rooms within the circuit of the corridor—a blank aquarium.
He unlocked his office, switched on the neon strip lights to buck up the weak winter light filtering from overhead, then as he always did first thing in the morning sat before the monitor screen and switched on.
Bad language, Eileen? Oh yes—the worst, and the best!
The screen flickered and unfogged. In a large undulating playroom two naked dark-skinned children, boy and girl, were rolling a giant beachball along. They were three or four years old. Another naked girl wandered after them, dragging a coiled plastic tube, and a second boy brought up the rear, holding his hands out before him, pretending to be blind and feeling his way.
Sole touched another switch and the sound of voices came from the playroom. However these weren't the children's voices.
He panned the camera—past the transparent-walled maze—to the great wall-screen that was

the source of the voices. The magnified images of Chris Sole and computer man Lionel Rosson moved on it.
The voices were theirs. And yet, not exactly theirs. The speech computer had taken their voices apart and put them together again. Otherwise their words wouldn't have flowed naturally.

Sole couldn't have framed the sentences he heard his recorded voice saying, without a great deal of hesitation. They were English sentences, yet so unEnglish. It was the arrangement of those strings of words that caused the confusion. The words themselves were simple enough. Such kids' talk. Yet organized as no kids' talk before, so that adults couldn't for the life of them follow it without a printout of the speech with a maze of brackets breaking it up to re-establish patterns the mind was used to processing.

It was Roussel speech.

He adjusted the controls to filter out his own and Rosson's voices; tuned the feathermike pickups for whatever the children might be saying.

But they were silent at the moment.

He had hundreds of hours of their speech on tape. from the earliest babbling through the first whole utterances to the sentences they were making now—embedded statements about an embedded world. He had walked among them, played with them, shown them how to use their maze and teaching dolls and oracles—wearing a speech-mask which snatched the words from his lips as soon as he whispered them, sent them to the computer for sorting and transforming, before voicing them.

Strictly speaking, he had no need to listen and look in, in this doting way. Monitoring was automatic; all the children said could be picked up by feathermikes, processed and sorted and stored on tape. Interesting or unexpected word patterns would be printed out for him.

Yet he found it intensely healthy to look in on them. A kind of therapy. Already, his dark sense of alienation had largely lifted.

"Organization-wise," the American was saying to Sam Bax, "the experimental part of Haddon is sealed off tight, but the kids out in the front wards are like in any normal hospital—you find this works out okay?"

"It has to be run this way, Tom. You see, correcting the speech defects out front, and getting the kids downstairs to speak 'defective' languages are like the left and right legs of the same body. Therapy and experiment back each other up, via the computer. We owe a lot to Lionel for the programming—quite a triumph for our computer boy, this!'

Rosson tossed his mane gracefully in acknowledgment. He alone of the staff never seemed bothered or bitchy. His presence had an aura of innocent kindliness about it.

"So you're busy making language right in the public sector, and wrong in the private? What's bad

for one set of kids helps you work out what'll be okay for the other set?"

"That's about it—though words like 'bad' create the wrong impression, Tom. I'd rather put it to you that the kids downstairs are learning special languages."

The American glanced round the room, assessing moods and personalities. Then he said casually:

"You talked about operating on the brain-damaged kids out front, before. Cutting out injured tissue. You do the same with the kids downstairs?"

"Christ no!" Sole exploded angrily. "That's a bloody immoral suggestion. Do you think we'd damage healthy tissue?—for an experiment? The children down below never had any sort of brain damage. They're fine. They're healthy!"

"You have to realize they're his pets, Mr Zwingler," Dorothy slipped in slyly. "You'd hardly believe our Chris had his own little boy at home—"

"Hmm, this PSF drug," nodded Zwingler. "It seems a dubious distinction to me—altering the brain by surgery, and altering it by a drug, if the drug's as long-acting as Sam supposes. What's

the effect exactly?"
He glanced about for another victim, fixed on Friedmann. The Bionics man's eyes bulged at the tug of his red moons, a rabbit hypnotized by a stoat. He bubbled out an eager string of explanations.
"It's a way of hastening protein manufacture. A sort of anti-Puromycin—Puromycin blocks protein synthesis, you know, and PSF facilitates it. It works on the Messenger-RNA—"
"So PSF stands for Protein Synthesis, er—Facilitator?"
Friedmann nodded violently.
"A unique lever for improving brain performance!"
"You might say it's a sort of . . . superintelligencer?"

"Oh, hardly that, no I don't think so. No magic increase in intelligence as such—just the learning process being speeded up—"
"Ain't learning speed the surest indicator of intelligence, though?"
"You have to appreciate the structure of nerve impulses in the brain," Friedmann rattled on. "The way the short-term electrical signals get fixed as something long-term and chemical. That's what learning is—this electricity being transformed into something solid. We can't inject information as such into the brain, like slotting in some miracle memory tape. But what we can do is hurry up the manufacture of protein while the brain is busy learning. We use PSF to help dormant areas of the damaged brain to take over language work more rapidly—"
Zwingler waved a hand, quieting Friedmann.
"But what about the special kids? Chris—you said they don't have any brain damage. Yet they're
receiving this drug. They must be learning a helluva lot faster than average kids. So what's the outcome?"
The rubies sparkled sharply at Sole, amused and testing him.
"Nothing harmful, I assure you," Sole blushed.
"Chris—" said the Director firmly, "do you mind filling in Tom on the three worlds before we head down there? The language angle—"
Sole made an effort to concentrate on practical details. Zwingler's ruby chips signalled attention; their wearer waited quietly behind them, a soft predator in a dark suit.
"Well, ever since Chomsky's pioneer work, we all assume that the plan for language is programmed into the mind at birth. The basic plan of language reflects our biological awareness of the world that has evolved us, you see. So we're teaching three artificial languages as probes at the frontiers of mind. We want to find out what the raw, fresh mind of a child will accept as natural— or 'real'. Dorothy teaches one language to test whether our idea of logic is 'realistic'—"
"Or whether reality is logical!" sniffed Dorothy—as though she wouldn't be at all surprised to find reality guilty of such dereliction and was ready to discipline it if she did.
Zwingler looked bored. Only when Sole got on to the subject of the next world, did his attitude change.
"Richard's interested in alternative reality states—what sort of tensions a language programmed to reflect them might set up in the raw human mind. He's built a kind of alien world down there, with its own rules—"
"You mean the sorta environment an alien being might actually grow up in, on some other planet?" The American leaned forward eagerly.
"Not exactly—" Sole glanced at Jannis; but the psychologist showed no particular desire to add

anything. "It's more like another—dimension. Built out of a number of perceptual illusions. Richard's something of a connoisseur of illusions—"
"Yeah, so I notice. Okay, I get the picture. Not a realistic alien planet. More like a kinda philosophical idea of alienness? How about the third world—I guess that's yours?"
"Yes . . . Ever heard of a poem by a French writer, Raymond Roussel—New Impressions of Africa?"
The American shook his head.
"Queer poem. Fact is, it's practically unreadable. I mean, literally. It's not that it's bad—it's bloody ingenious. But it's the most crazy example of what we call 'self-embedding' in linguistics —and that's what my children learn—"
"Self-embedding—how would you describe that?"
Having only just finished reading Zwingler's paper on the language difficulties of astronauts a few hours before, Sole found it hard to credit the American with quite such innocence of the jargon of linguistics as he made out. Nevertheless, he explained.
"Self-embedding is a special use of what we call 'recursive rules'—these are rules for doing the same thing
more than once when you form a sentence, so that you can make your sentence any shape and size you like. Animals have to rely on a fixed set of signals for communication purposes—or else on varying the strength of the same signal. But we humans aren't limited like that. Every sentence we construct is a fresh creation. That's because of this recursive feature. 'The dog and the cat and the bear ate.' 'They ate the bread and cheese and fruit, lustily and greedily.' You've never heard these particular sentences before—they're new—but you have no trouble understanding them. That's because we've got this flexible, creative programme for language in our minds. But self-embedding pushes the human mind pretty near its limits—which is why we can use it as a probe at the frontier—"
"Better give us an example of this self-embedding, Chris," interrupted Sam. "This is all getting a bit theoretical for my head."
Sole glanced at Sam curiously. Surely Sam knew perfectly well what he was talking about, too. Jannis sat back smugly, his expression implying that he was well out of this—how had he put it? —jumping through the hoops.
Still, if that was how Sam wanted it . . .
"Let's take a nursery rhyme then—this one's a beautiful recursive series, dead easy to follow . . ."
As he started reciting it, however, a memory from boyhood triggered itself in his head—and he was seven years old again, standing up in Sunday School to pipe out the same nursery rhyme as part of a Harvest Festival. He'd fluffed his lines, half-way through. Had to be prompted. The experience stuck in his nervous system, a tiny thorn of shame. Now the thorn re-emerged, producing a sudden, silly anxiety to get through the recitation safely— which made him come unstuck again, and sit there open-mouthed, waiting to be prompted . . .
"This is the farmer sowing his corn,
That kept the cock that crowed in the morn,
That wakened the priest all shaven and shorn,
That—"
That what? WHAT WHAT WHAT? a childish voice yammered inside his head—while another area of him watched this idiotic repetition of events and wondered to what extent all his fascination with language, particularly 'bad' language, sprang from this original public shaming .

. .
A soft American voice came to his rescue . . .
"That married the man all tattered and torn—
"Come "That kissed the maiden all forlorn—"
But the man in him halted suspiciously. Richard, Sam, Dorothy, pop-eyed Friedmann all seemed part of a grinning audience of parents watching him...
However the American hurried him on, exuberantly chanting the next couple of phrases:
"That milked the cow with the crumpled horn, That tossed the dog—"
"That chased the cat," said Sole tentatively.
"That worried the rat!" responded Zwingler, quick as a flash.
"That ate the malt," smiled Sole.
"That lay in the house that Jack built!"
Zwingler ended in triumph. His rubies flashed a victory dance. He'd captured the rhyme. A game had been set up—and he'd won it.
Damn, thought Sole, I ought to have counted ahead. Glancing at Jannis, he caught a hint of angry disgust. A trap had been set by a smart operator, and he'd fallen into it. It was that bloody memory getting in the way. A language trap too—he should have known better.
"Any four-year-old can follow that nursery rhyme," Sole fired back, his face flushed. "It's another story when you embed the same phrases. 'This is the malt that the rat that the cat that the dog worried killed ate.' How about that? Grammatically correct—but you can hardly understand it. Take the embedding a bit further and you end up with the situation in Roussel's poem. The Surrealists tried building machines for reading Roussel. But the most sensitive, flexible device we know of for processing language—our own brain—is stymied."
"Why's that, Chris?"
Zwingler's face seemed to leer at him—but the American sounded genuinely interested. Uncomfortably Sole hurried through a brief explanation; noticing as he did so that Sam looked pleased.

"Well, speech processing depends on the volume of information the brain can store short-term —"
"This amount being limited by the time it takes short-term memory to become permanent and chemical, instead of electrical?"
"Right. But a permanent form isn't practical for every single word—we only need remember the basic meaning. So you've got one level of information—that's the actual words we use, on the surface of the mind. The other permanent level, deep down, contains highly abstract concepts—idea associations linked together network-style. In between these two levels comes the mind's plan for making sentences out of ideas. This plan contains the rules of what we call Universal Grammar—we say it's universal, as this plan is part of the basic structure of mind and the same rules can translate ideas into any human language whatever—"
"All languages being cousins beneath the skin, in other words?"
"Right again. They resemble each other like faces in a family. But each cousin's face has its own individual outlook on reality. If we could simply stack all these 'faces' one on top of another to work out the rules of universal grammar that way—well, we'd have a map of the whole possible territory of human thought—everything we can ever hope to express, as a species."
"But you couldn't just stack all these languages, could you? Some have died out and disappeared —"

"And a whole lot more might exist, but they haven't been invented."
"Which is why you're using artificial languages as frontier probes?"
"Exactly."
"But Chris. You're using this PSF chemical, to teach them. What makes you think it's a natural situation? Surely our brains would have learnt at this higher rate if they were intended to, biologically—"
"Aha—and God would have given us wings if he'd meant us to fly! Not that old argument, please. PSF is just an aid, as its name implies."
"Hmm. How long did you carry out animal tests first?"
"It isn't the same thing!" Sole said exasperatedly. "You can't teach language to a monkey or a guinea pig."
"Okay, you're the expert," shrugged Zwingler. "They're picking up this embedded speech at any rate—?"
Sole darted a brief smile at Rosson.
"I'd say it's promising, eh, Lionel?"
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"More than that," nodded Rosson, with a grin of satisfaction. He too loved the children down below.
"Can I listen in on what they're saying, Chris?"
"What? Oh—yes, just a minute."
Sole fiddled with the audio controls on the wall panel, passed Zwingler a pair of headphones. The American held them to one ear, pursing his lips. Meanwhile Richard Jannis stalked off along the corridor towards his own territory . . .
"Yeah. It is different. Boy, you have messed up the syntax!"
Vasilki had reached the maze centre. Now she was standing by the Oracle, talking to the tall cylinder.
"Kid's saying something about . . . rain?"
"It does rain in there, actually. Sprinkler system washes the place out and gives them a shower. You should see them enjoy it. They have a ball."
"Nice. Say, when you go in there, how does that speech-mask gizmo you were talking about operate?"
"We go through the motions of speaking. But we only subvocalize the words. The mask picks the words up, runs them through the computer programme, then re-synthesizes the sentences out loud in an embedded form. The masks are hooked into the computer by radio."
"Neat—so long as the kids don't go in for lip reading."
"We thought of that too. That's why we call it a mask. Only place they see our lips moving is on the teaching screen—and that's mime."
Zwingler shifted the phones to his other ear.
"Wonder just how deep this embedding will reach? Will the kids try shifting your own 'corrections' back again to the norm?"
"Then," said Sole with conviction, "we really shall have found out something about the mind's idea of all possible languages."
"You mean all possible human languages, don't you Chris?"
Sole laughed. It seemed such a pointless objection.
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"Put it another way then. All languages spoken by beings evolved on the same basis as ourselves.

I can't vouch for languages that silicon salamanders elsewhere in the universe might have dreamt up!"
"Could be such beings would use a kind of printed circuit, binary set-up, more like a computer?" mused Zwingler, apparently taking the joke seriously.
Vidya trod a few paces away from the maze, to a large orange plastic doll, picked it up and set it on its feet. The doll stood as high as his shoulders.
He fiddled with its side and the doll unhinged. He lifted out a smaller doll, a red one, stood it next to the first doll, then closed the first doll's body again. This second doll came as high as the first doll's shoulders . . .
"Teaching aids," Sole commented as he took the phones back from Zwingler and hung them up again. "The dolls' bodies carry memory circuits imprinted with a couple of dozen fairy tales. Opening the large doll triggers one of these stories at random. But the cute wrinkle is this: they have to disassemble and reassemble the whole set in the right sequence to get the full story—and the story itself is linguistically embedded, same way as the dolls are embedded physically. There's seven in all. See, he's unpacking number three—"
However, Zwingler was still busy wondering aloud about computer-style languages.
"It's just not on, linguistically," said Rosson. "You see, the brain has its data associated together in multi-layered networks. Language reflects this. Whereas a computer has a separate 'address tag' for each bit of data. In point of fact, Chris's embeddings may be rejected simply because the mind isn't a computer. It won't know where to associate the incoming data because the clues are delayed too long—and it can't afford to store so much, even if we do use PSF. . ."

Consulting about the kids' problems:
"A mental disaster—among Chris's kids? You'd go so far as that?" For the first time Sam looked concerned, briefly.
"That's what I've been trying to tell you!"
The screen lit and snowed with static, cleared to show Vidya opening up the largest of the talking dolls, taking the smaller doll from inside it, and shutting the larger doll neatly before

moving on to the opening of the smaller.
"This is incident number one.
Rosson gestured at the screen.
"It was the story of the Princess and the Pea, Sam. I checked. How the real princess with the fairest skin in all the land—the least blunted nerve endings to you, Sam! — is the only girl that can feel the pea hidden under a pile of feather mattresses."
"Yes yes," said Sam impatiently.
They reviewed the first 'fit', the one to which Sole had drawn Rosson's attention before leaving.
"I wondered whether it might have had anything to do with the story itself—that business of mattress upon mattress upon mattress. Then the hard pea—the nub of the matter—at the very bottom of the pile. It's a sort of mocking comment on the embedded speech, isn't it Sam?"
Rosson blanked the screen and punched a new set of figures from memory.
The screen snowed once more and cleared.
"This is the second episode, Sam—this happened about forty-eight hours later, after Chris had left."
Three children surrounded the Oracle in the centre of the maze. But Vidya was resisting the

room's whisperings and hypnotic programming of events.
He was shouting and screaming, raging round the outside of the maze walls, whipping them with a piece of plastic pipe—and howling at the children inside.
Rosson switched the loudspeaker on and incoherent cries rang out.
"I couldn't make head or tail of it, Sam. The computer claimed it was a genuinely random string of syllables. But I'm beginning to suspect it represents a reversion to babbling, only on a much higher level."
"Or a childish tantrum."
"Yes, it expresses itself as a tantrum—I can see that. But is that all there is to it, for Christ's sake! What sort of situation does this kind of reversion to babbling normally occur in? Only when a much younger child has suffered a brain injury then goes right back to the beginning of
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the language learning process again. Vidya's far too old."
"Unless the PSF has changed things?"
"Precisely, Sam! That's what I'm thinking. The brain's programme for acquiring speech must have been disrupted somehow."
"Or speeded up?"
"One of the two. Wish I knew which. If you want my candid opinion, what we're seeing here is some kind of clash between the brain's own programme for generating language, and the programme we've imposed on it—the embedding programme. But the embedding programme isn't simply being tossed out by the brain. The PSF allows a much greater tolerance of data. So his brain must be trying to weave the embedding into the brain's 'natural' design for language. And the two designs just won't and can't match. The boy's brain has *jammed*—on account of its sheer versatility. And that jamming has thrown him right back to a random babbling stage. The set of rules has failed him—so he's reverting to Trial and Error methods. God knows what'll come out of this present babble, though!"
Sam Bax saw Vidya race round the maze. He whipped the walls. He howled. He babbled incomprehensibly.
"The lad looks well enough co-ordinated," he remarked. "Nothing much wrong there. Agile lad."
"Watch, Sam."
After several more circuits of the maze, Vidya cried out like an epileptic and collapsed beside the maze entrance. His slim body writhed about. His ringers flexed. He clawed at the floor as if to tug it up in strips. Finally he lay still.
"Dizzy! I'm not surprised. Running round and round like that."
"Dizzy my arse! The boy had a fit. He was working himself up to it. He's giving himself his own shock therapy. Discharging the contradictions in his mind."
Rossori tapped out a fresh code on the console.
The screen cleared to the scene of Vidya's recovery. The boy got up calmly and trotted into the maze.

"Ph'theri—I've tried to achieve a kind of 'embedding', to test out the frontiers of reality, using young human brains. Maybe it's a coincidence of words? No, I don't think so. You think it's impossible to test out reality with one species on one planet. Tell me this, Ph'theri, would you be willing to miss the tide if it was worth your while? If it brought your search to an end? If it saved *all* time for the Sp'thra?"

Sole fished Pierre's letter out of his pocket.
And began to tell the tall alien all that he knew of the Xemahoa tribe of Brazil . . .

the screen looked calm. But Rosson was well aware it was a deceptive calm. There was violence in the children's minds now. Mostly it kept below the surface. But every day some time it erupted.
They'd accomplished what it had taken hundreds of generations of Stone Age children to accomplish—and done it in a flash of days. They had invented language. But what language was it they had invented?
Vidya, followed by the other children, had passed through the babbling phase. It was now clear to Rosson that it hadn't been just a babbling of sounds—but a babbling of ideas and concepts. They had resumed whole speech. However it was a whole speech that bore little relation to the whole speech they had been learning before the crisis. And it was interrupted by storms of violent, destructive activity that left the children lying about the room exhausted, hunted nearly to death by the pack of zombie words.
The computer programme to analyse their new language lay barely started on Rosson's desk. He had no time. Things were going too fast. He felt like a blind man staring at Madame Curie's blob of radium—seeing nothing, but getting his blind eyes burnt in the process.
As he watched, Vidya rose with a savage snarl twisting his face. He began to stalk an invisible prey. Picking up speed, he trotted off in a long ellipse around the room.
Every time a crisis occurred, a fresh variable seemed to he thrown into the equation. Fresh neural pathways fused open. The brain was blowing fuses—but the fuse wires sprouted across the gaps spontaneously, and rapidly—almost as a function of the fusing itself.
The experiment was out of control now, and only Rosson was interested.
What to do about it? Withdraw PSF from their diet? When the drug was so obviously producing results?
Vasilki got up next and set off on her own course round the room, helter-skelter.
Then Rama. Then Gulshen.
Soon the four children were running round the room, faces warped with concentration.
The ellipses they were running wound tighter and more furiously as he looked. He understood the relation between movement and speech in his own logic world. There, the dance of the children was a redundancy strategy— letting language be purified of excess. But here something else was going on. Some different, new relationship between motion and thought. Between the movement areas of the brain and the symbol areas. Were the tensions in the children's minds discharging themselves out of the symbol world of thought and language, into the world of movement? Or were new symbolic relationships being formed by these mad bursts of activity themselves?
Suppose PSF speeded up the manufacture of 'information molecules' to such an extent that the mind got over-saturated, would the mind be forced to create fresh symbols to carry on functioning? And would these symbols be formed in the action centres of the brain, if the normal symbol areas were already overloaded? Then these would be 'action-symbols'—symbols that sensed it as their duty to manipulate the outside world directly. The way that magicians used to believe they could, through their spells and magic shapes—their 'reality symbols'.
The children raced closer to a fearful density of symbolic experience.
Abruptly, they collided. Limbs were mixed up together as madly as a Hindu god's. Then the four bodies were hurled apart as if by an electric shock.

They fell apart so violently that Gulshen was left lying up against the maze wall with her left leg crumpled under her body at an impossible angle.

Inside the Embedding World the wall screen was dead and the four children lay sleeping on the floor in a neat row.
Gulshen's leg was encased in plaster. Rama's hand was wrapped in bandages. Vasilki's brow was bandaged and her face badly bruised.
Vidya was the only unblemished one. Yet he did not sleep quietly. Even through the tranquillizers and barbiturates his lips moved. Muscular tics twisted them.
Sole barely registered the peculiar circumstances. A glance showed him that Vidya was safe and that was all
he cared about. He walked through the airlock ignoring the speech mask hanging up, dropped the carrier bag beside the boy and bent over him.
"Vidya!" he called tentatively.
The boy moved fitfully and his lips twitched but he didn't open his eyes.
Drugged, Sole noted with distaste. He glanced at the video pickups. Possibly they weren't

switched on, and if they were switched on nobody would be watching, as there was nothing to record.
He emptied the clothes out of the carrier bag and began dressing Vidya. Amusing to think of the boy waking up fully dressed for the very first time—maybe feeling bound up in a bit of a strait jacket at first—then the huge enlargement of his vistas dawning on him . . .
Sole carried the sleeping Vidya up in the lift and along the corridor. Outside the hairmesh security glass, the green barbed woods pressed a corset round the building. It was quiet.
He unlocked the first door.
In the interface between the two doors, Lionel Rosson stood waking for him. He didn't seem surprised to see him, or the boy in his arms.
"What are you up to, Chris? Sabotage? Or is it sentimentality? I suppose I ought to say welcome home to Haddon. But let's get that boy back to his proper place first, hmm? Oh, I would have wanted you back here so desperately, a week ago! But now . . . well—it's different, isn't it?"
Sole whispered furiously:
"I'm taking Vidya out of here. To live a real life. I'm sick of bogus science and lying politics. Projects for the advancement of Mankind!
"You don't understand the situation, Chris. Let's take Vidya downstairs again. We'll work out a strategy, hmm?"
"Who wants a 'strategy'?" sneered Sole.
"We do, Chris. Things reached crisis point—"
"You've ballsed things up, you bastard—you didn't look after Vidya!"
Sole put the boy down on the floor gently.
"For Chrisake, Chris, listen to me—the language programme broke down. The kids accepted the overload on short term memory up to a certain point. But it's broken down now like a dam bursting. The kids reverted to babbling. Not baby
babbling. It was concepts, ways of thinking—"
"Get out of my way, you. Fuck your ways of thinking."
"The thing is, your embedding has—"
Sole hit Rosson in the stomach.

"—taken place," gasped Rosson. Sole caught hold of his mane of hair and swung his head against the wall violently till Rosson crumpled up and sagged to the floor.
He picked Vidya up again and unlocked the outer door.
Sole carried Vidya through the frozen fields by the same route as he'd come. Though it was the longer way round to his house, it was less public. He was less likely to meet anyone. As he walked, the cold air began to penetrate Vidya's sleep. The boy had never felt such cold before. His lips tasted it and twitched. His cheeks blushed with it. His skin crawled.
Sole crossed the road where he'd parted from Pierre and set his eyes on the blue car parked by his house. The Volkswagen spelt mobility. Escape.
He held the boy tight, loving him and hating all else, as the child's lips began to mumble sounds.
Vidya's eyes opened, and he stared blankly at the great
blue vault of sky and towering skeletons of trees.
Eileen and Pierre came out to meet him, Pierre catching hold of her arm to stop her when he saw the hoy.
"Chris—what sort of game is this?"
She stared at Vidya and the boy stared back, locking on her eyes disconcertingly.
"You've brought an Indian boy back from Brazil?"
"Chris brought nothing but himself and me. That's one of their experiments from the Unit. They usually keep them under lock and key—Chris must have flipped his lid bringing him here —"
Inside the house, a telephone bell began to jangle.
Pierre took his hand off Eileen's arm, belatedly.
"Shall I answer? I can guess what it is. You mightn't realize it, Eileen, but your Chris has just

torn his precious career up and thrown the pieces in the air."
She stared at the Frenchman in bewilderment.
"What— ?"
"Chris has just committed a huge breach of security. Though God knows why. It doesn't look like he does—"
Chris hugged the boy, and gazed down at him.
"Fortunately he's healthy," he said, as much to himself as to Eileen or Pierre. "There's nothing physically wrong with him. He's bright. Look at him taking it all in, cunning little bugger—"
Pierre gestured questioningly at the house, where the telephone kept on ringing. But Eileen wasn't paying attention. She stared from her husband to the child in its ill-fitting clothes. Pierre shrugged and went indoors to take the call.
"Do you mean this kid is yours, Chris?"
"Why yes! Who's else?"
"But . . . when? How? Is this what you dragged Pierre here to witness—this shabby domestic intrigue? This petty tit for tat. After you've been away such a time you can only produce this gesture—you petty hateful nobody!"
Vidya stared at her face twisted by anger. His fists balled up inside his gloves. His body arched against the restraint of clothes. He writhed about like a snake in Sole's embrace as the cold air stung his face.
Sole stared at his wife. Her outburst puzzled him. It seemed so paranoid and irrelevant. He hadn't even been away 'such a time'—it was less than two weeks.

"I didn't screw some bitch foreign nurse if that's what you think! Vidya is the child of my—my mind."
"So Peter isn't a product of your precious mind? A cruel trick, Chris, bringing Pierre here to rub it in."
"That's an accident, Pierre being here. Honestly. My God, why should it be a trick?"
"Can I see into your heart any better than you can yourself? Do I know why your subconscious needs a set-piece like this?"
"Setpiece? What the hell are you talking about!"
"Pierre arriving. Then your dramatic entry with your 'real' child in your arms. That's a child of the mind is it? I can't compete with that. What on earth is a child of the mind!"
The boy's eyes flashed from Sole to his wife and back again. The electricity of words flowed between them, and he fed on it greedily. Sole had to hold him tighter as his limbs flexed and he twisted about in his arms. It was all emotional nonsense Eileen was talking. It didn't make sense. The idea of bringing Pierre here hadn't been that at all. It had been—generosity. An attempt to give her something, not take something away, or humiliate her.
"I don't suppose I can stay here anyhow. Have you got the car keys? I'll have to take him somewhere else."
"This is beyond me. You just . . . simply . . . amaze me."
Sole began to feel a curious light-headedness.
Eileen was receding into the background. The house, the car, the landscape were all changing subtly. Still there, but—different.
He was still seeing familiar things; but seeing them as though this was the first time he had set eyes on them. The familiar things were at the same time infinitely strange and fresh. They had taken on an unsettling double life. Their colours were faded and at the same time bright. Their shapes fitted in neatly to his customary picture of things—and simultaneously were oddly distorted and foreshortened as though the rules of perspective were being interfered with.
The house, as well as being a house, was now a giant red box of plastic bricks. The car was a Volkswagen saloon—and also a great plastic and glass spheroid of no very obvious function.
Eileen stood before him—a flat figure posturing on a screen suspended in mid-air.
Beyond, a barren plateau stretched out into infinite distance, unable to terminate itself with any solid boundary. Panic mounted in him as he searched for the boundaries that ought to be there, and were not. The most he could locate was a circular zone of confused light, very far away. Or was it very far away? Or very near? He couldn't tell—and when he tried to concentrate on the problem, the world flashed in and out at him, frighteningly, growing alternately very large and very small. In that confused zone far off, lines of sight broke down and vanishing points stubbornly refused to vanish. He tried to fashion a wall out of that medley of lights and darks far off—but the wall, half-completed, flowed in at him and out again, flexing and contracting about him, as though he had been swallowed by a soft glass stomach he could see through—and the stomach walls pulsed in and out while its acids nibbled at his bare skin, licking it with a harsh invisible tongue.
From this unbounded, menacing plateau sprung at intervals stiff towering giants, balanced upon great solitary legs, waving their hundreds of arms and thousands of fingers slackly overhead.
Above their reach was more of the great opaque stomach—its foggy depths were coloured blue, up there. They fled away and raced towards him, compressing him to a tiny spot, then inflating him till it seemed his head would burst with thinking of it.

Then he did an impossible thing.
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He twisted about, in fright, in his own grasp; for an instant, saw both himself holding, and himself being held —saw the Self that held him, and saw the Self he held; the two sights superimposed on one another. Almost as soon as it formed, this double vision fell apart, and the two states began to alternate separately before his horrified eyes.
Rapidly, the two versions of Himself speeded up their substitutions of one another—quickening pace till they were flashing before his gaze like a film and producing a sickening illusion of continuity—but continuity in being two separate places at once.
Soon the visions fused again—and he was holding on to himself, and struggling against himself, not knowing which was the true state.
As before, the double vision shattered. He was Sole the Man staring in fear and nausea into the Boy's eyes. But these eyes swelled into deep pools. Mirrors. Saucers of glass. He could see himself reflected in them, at the same time as he saw himself *through* them.
In their depths a whirlpool spun frantically on its own axis, sucking everything in to a vanishing point that never vanished but only grew fearfully dense with light—with all the sights it was seeing yet couldn't find a way to discard from attention.
He wore the sky close as a hat. He knew the moil and coil of wisp clouds barely visible in the blue, intimately. His fingers branched the branching of the trees. His tongue tasted one by one the rows of brick teeth in that closed red mouth of a house that would swallow him, swallow him. And, at the very same time, he knew he was already swallowed, by the pulsing translucent stomach of the outside world.
This world flipped, into a new state of being.
It fell apart from lines and solids into a pointillist chaos of dots. Bright dots and dark dots. Blue dots, red dots, green dots. No form held true. No distance held fast. New forms making use of these dots in entirely arbitrary, experimental ways, sprang into being among the overwhelming debris of sense perceptions outside of him—fought to impose themselves on the flux of being—failed. Fell apart. And new forms rose.
A new creation was struggling to build itself out of the flood of information pouring at him. A new meaning. But all the sane, functional boundaries had dissolved and this chaos was saturated with meaning to such an extent it had lost all possibility of meaning any one thing or set of things. All appeared as of equal value.
A terrible, physical pressure was building in him, to crystallize this saturated world out into meaning—at all costs.
Where was the third dimension, that kept reality spaced out? This world seemed twodimensional now—pressing tight about his eyes and ears and nose like a membrane, as packed
with matter as the heart of a collapsed star. A flat sphere of dots of sense data pressing directly on to his brain, bypassing even his eyes and ears. It bound his thoughts about like a hungry womb.
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The pressure in his head became an urgent need to smash his way through this membrane—to force things to become three-dimensional again, and absorb the vast excess of data.
And yet he was aware, instinctively, that the world he was seeing already was threedimensional—
that this two-dimensional quality was merely an agonizing illusion. Aware that he
was trying to force something upon the world that could not be there in any rational universe— a

dimension at right angles to this reality: somewhere to store the sheer volume of information flooding his brain and refusing to fade away.
He was watching a movie—but as the new scenes arrived, the old scenes refused to yield and pass on. They too continued to be screened. He had to find somewhere to put them, where he could forget about them.
'A dimension at right angles'? The image stung him to awareness of where he was, and who. The Man holding the Boy. And he realized with horror that these thoughts and emotions were largely Vidya's—and how he was now trapped by them.
Reason—rationality—is a concentration camp, where the sets of concepts for surviving in a chaotic universe form vast, though finite, rows of huts, separated into blocks by electric fences, which the searchlights of Attention rove over, picking out now one group of huts, now another. Thoughts, like prisoners—imprisoned for their own security and safety—scurry and march and labour in a flat two-dimensional zone, forbidden to leap fences, gunned down by laser beams of madness and unreason if they try to.
Vidya's concentration camp had bulged at the seams. The fences fell over from sheer pressure of bodies. The outermost fence—the boundary beyond which lay the in-articulable—had snapped too. And this was unfortunate— for the concentration camp is the survival strategy of the species.
Vidya's thoughts spilled out—into Sole's mind, and into that chaos beyond, 'whereof we cannot speak', dragging him after them.
Sole grew vaguely aware of a flat ghost of a figure parading before his eyes, and gesticulating. A man's voice, with a French accent, cried:
"For God's sake get away from him, Chris—leave him alone! The boy's mad. He can infect you with it, if you're too near him. They said on the phone, a projective empath. And mad. They're coming for him with an ambulance. Put him down and walk away—"
The flat, posturing ghost of dots pulled a second ghost figure back into the brick-toothed mouth that had wanted to gulp him and swallow him up in the flatness of its walls. But he was beyond boundaries, flying high.
"You don't see any vision of truth, Chris—my God, you've created a monster worse than that Xemahoa beast!"
The world flowed around him more demandingly again —a million bits of information. His present awareness, however much it distended, still ached with the strain of finding room for all this fearful wealth. The world was about to be embedded in his mind in its totality as a direct sensory apprehension, and not as something safely symbolized and distanced by words and abstract thoughts. The Greater was about to be embedded in the Lesser. Frantically he searched for adjacent dimensions of existence to receive this spill—the spill-water from a flooded dam. Yet the pressure could only discharge back into the same dimensional framework as the brain that perceived it. His fear of the coming discharge grew—a wild panic as the Embedding coiled within him.
"Come away, Chris. The boy has to be kept sedated. They'll have to operate on him. They'll have to cripple his brain, to save him. Put him inside the car, shut the door on him."
But Vidya is my mindchild. How do I leave my mind?
Sole-Vidya had no way to leave himself.
All sensory information about the situation flowed the other way.
Inwards. Sucked into the whirlpool—occupying mental space without being able to oust what had already flowed in.

The spring would overwind—would burst and fly apart.
"Please come away," begged Eileen. "Leave him."
Leave Vidya? Leave himself?
Vidya's limbs thrashed about in a mechanical dance as Sole held him tighter in his arms, and loved him, agonizing with him . . .
"Kid snapped his own neck," Rosson told Sam Bax bitterly as a male nurse lifted the dead boy into the back of the ambulance. He rubbed his own skull tenderly beneath the mop of hair. "Injuries weren't nearly so bad with the other kids. You might say this boy was the ringleader. I can't say I didn't warn you, Sam."
"How does this affect the use of PSF in general, Lionel?" the Director demanded in a testy tone. "Is this the first sign of a general breakdown? God, what a mess if it is. All those people we've treated and let go home."
"Not necessarily, Sam. PSF is being used in conjunction with straightforward language procedures in the main part of the Unit. It can only do good there. Dorothy and I are working with logical patterns. There's not this saturation effect. Richard's world might give us some trouble soon, I dunno. . . I'm just astonished by the form this particular breakdown took—the

projective empathy factor. Now that's really a fascinating byproduct. If Chris had damn well listened to me we might have had a chance to explore it instead of a snapped neck. We still have a chance with the other three kids. For God's sake let's be careful."
"A kind of telepathy, is it, Lionel?"
Rosson looked doubtful.
"I think what was happening in Vidya's brain was an overload of data that his mind couldn't switch off. It was forced to go on processing it. Couldn't filter it out. The brain circuits must have fused open—repeating and repeating. And this amplified the voltage flow far beyond what the brain machine is designed for. In fact, the current got so strong that it was able to transmit some kind of echo of itself that other brains could detect. That must be how this projective empathy works—and I suppose other parapsychological phenomena. Some sort of field is laid down that another brain can pick up, which disturbs the chemical balance of the corresponding sets of neurons in the other brain and stimulates them to a ghost firing. That's your telepathy for you—such as it is. Not genuine communication of ideas from mind to mind. Not dialogue—but a domineering influence, a sort of electrochemical hypnosis. Frightening—and not very useful. Since the boy was effectively insane—and broadcasting his insanity. I felt the same effect myself, when I was close to the boy, before we sedated them. When Chris comes out of shock, perhaps he'll be better qualified to comment—he's been dragged deeper into it than me."
Sam Bax stared irritably at Sole's body lying sedated on a second stretcher.
"With this little escapade I rather fear our Dr Sole has cooked his goose."
Rosson looked at Sole too. His head was hurting him.
"He's been under strain. Let's not make too much fuss about it, Sam. We'll all need to pull together to clear this mess up," he said generously—though he cursed Sole for a bastard and a fool.
Sam shrugged, unimpressed. He looked round for Eileen.
"Ah—Mrs Sole. Your husband will have to go into the Unit for observation, you realize. I'll see you're kept informed. It might be as well if you didn't visit him immediately."
"Quite," she answered dryly.
Shortly after, the ambulance drove away.

"Unless Sole's mind is cracked as bad as the boy's," Sam Bax purred at Rosson, ushering him impatiently towards his own car.
Rosson tossed his mane of hair, winced as it tugged at his broken scalp.