Robert Pirsig's

Zen and the art of motorcycle maintenance

Roughly cut and gently remixed by Andreas Lloyd

I

This text is something like an essay. But the trouble with essays is that they always have to sound like God talking for eternity, and that isn't the way it ever is. People should see that it's never anything other than just one person talking from one place in time and space and circumstance. It's never been anything else, ever, but you can't get that across in an essay.

So this is something else. A recollection, a meditation, a presentation of thoughts through which I have found something that I hope will be of use to others, if they take the time and effort to take it in.

The title of this journey of ideas is "Zen and the Art of Motorcycle Maintenance," however, it should in no way be associated with that great body of factual information relating to orthodox Zen Buddhist practice. It's not very factual on motorcycles, either.

In writing this, I was inspired by two friends of mine, John Sutherland and his wife Sylvia. What inspired me was a certain undercurrent of disharmony between them.

Disharmony I suppose is common enough in any marriage, but in their case it seems more tragic. To me, anyway.

It’s not a personality clash between them; it’s something else, for which neither is to blame, but for which neither has any solution, and for which I’m not sure I have any solution either, just ideas.

The ideas began with what seemed to be a minor difference of opinion between John and me on a matter of small importance: how much one should maintain one’s own motorcycle. It seems natural and normal to me to make use of the small tool kits and instruction booklets supplied with each machine, and keep it tuned and adjusted myself. John demurs. He prefers to let a competent mechanic take care of these things so that they are done right. Neither viewpoint is unusual, and this minor difference would never have become magnified if we didn’t spend so much time riding together and sitting in country roadhouses drinking beer and talking about whatever comes to mind. What comes to mind, usually, is whatever we’ve been thinking about in the half hour or forty-five minutes since we last talked to each other. When it’s roads or weather or people or old memories or what’s in the newspapers, the conversation just naturally builds pleasantly. But whenever the performance of the machine has been on my mind and gets into the conversation, the building stops. The conversation no longer moves forward. There is a silence and a break in the continuity. It is as though two old friends, a Catholic and Protestant, were sitting drinking beer, enjoying life, and the subject of birth control somehow came up. Big freeze-out.

And, of course, when you discover something like that it’s like discovering a tooth with a missing filling. You can never leave it alone. You have to probe it, work around it, push on it, think about it, not because it’s enjoyable but because it’s on your mind and it won’t get off your mind. And the more I probe and push on this subject of cycle maintenance the more irritated he gets, and of course that makes me want to probe and push all the more. Not deliberately to irritate him but because the irritation seems symptomatic of something deeper, something under the surface that isn’t immediately apparent.

When you’re talking birth control, what blocks it and freezes it out is that it’s not a matter of more or fewer babies being argued. That’s just on the surface. What’s underneath is a conflict of faith, of faith in empirical social planning versus faith in the authority of God as revealed by the teachings of the Catholic Church. You can prove the practicality of planned parenthood till you get tired of listening to yourself and it’s going to go nowhere because your antagonist isn’t buying the assumption that anything socially practical is good per se. Goodness for him has other sources which he values as much as or more than social practicality.

So it is with John. I could preach the practical value and worth of motorcycle maintenance till I’m hoarse and it would make not a dent in him. After two sentences on the subject his eyes go completely glassy and he changes the conversation or just looks away. He doesn’t want to hear about it.

Sylvia is completely with him on this one. In fact she is even more emphatic. "It’s just a whole other thing," she says, when in a thoughtful mood. "Like garbage," she says, when not. They want not to understand it. Not to hear about it. And the more I try to fathom what makes me enjoy mechanical work and them hate it so, the more elusive it becomes. The ultimate cause of this originally minor difference of opinion appears to run way, way deep.

Inability on their part is ruled out immediately. They are both plenty bright enough. Either one of them could learn to tune a motorcycle in an hour and a half if they put their minds and energy to it, and the saving in money and worry and delay would repay them over and over again for their effort. And they know that. Or maybe they don’t. I don’t know. I never confront them with the question. It’s better to just get along.

But I remember once, outside a bar in Savage, Minnesota, on a really scorching day when I just about let loose. We'd been in the bar for about an hour and we came out and the machines were so hot you could hardly get on them. I'm started and ready to go and there's John pumping away on the kick starter. I smell gas like we're next to a refinery and tell him so, thinking this is enough to let him know his engine's flooded.

"Yeah, I smell it too," he says and keeps on pumping. And he pumps and pumps and jumps and pumps and I don't know what more to say. Finally, he's really winded and sweat's running down all over his face and he can't pump anymore, and so I suggest taking out the plugs to dry them off and air out the cylinders while we go back for another beer.

Oh my God no! He doesn't want to get into all that stuff.

"All what stuff?"

"Oh, getting out the tools and all that stuff. There's no reason why it shouldn't start. It's a brand-new machine and I'm following the instructions perfectly. See, it's right on full choke like they say."

"Full choke!"

"That's what the instructions say."

"That's for when it's cold!"

"Well, we've been in there for a half an hour at least," he says.

It kind of shakes me up. "This is a hot day, John," I say. "And they take longer than that to cool off even on a freezing day."

He scratches his head. "Well, why don't they tell you that in the instructions?" He opens the choke and on the second kick it starts. "I guess that was it," he says cheerfully.

And the very next day we were out near the same area and it happened again. This time I was determined not to say a word, and when my wife urged me to go over and help him I shook my head. I told her that until he had a real felt need he was just going to resent help, so we went over and sat in the shade and waited.

I noticed he was being superpolite to Sylvia while he pumped away, meaning he was furious, and she was looking over with a kind of "Ye gods!" look. If he had asked any single question I would have been over in a second to diagnose it, but he wouldn't. It must have been fifteen minutes before he got it started.

Later we were drinking beer again over at Lake Minnetonka and everybody was talking around the table, but he was silent and I could see he was really tied up in knots inside. After all that time. Probably to get them untied he finally said, "You know—when it doesn't start like that it just—really turns me into a monster inside. I just get paranoic about it." This seemed to loosen him up, and he added, "They just had this one motorcycle, see? This lemon. And they didn't know what to do with it, whether to send it back to the factory or sell it for scrap or what—and then at the last moment they saw me coming. With eighteen hundred bucks in my pocket. And they knew their problems were over."

In a kind of singsong voice I repeated the plea for tuning and he tried hard to listen. He really tries hard sometimes. But then the block came again and he was off to the bar for another round for all of us and the subject was closed.

He is not stubborn, not narrow-minded, not lazy, not stupid. There was just no easy explanation. So it was left up in the air, a kind of mystery that one gives up on because there is no sense in just going round and round and round looking for an answer that's not there.

I might have thought this was just a peculiar attitude of theirs about motorcycles but discovered later that it extended to other things -- .Waiting for them to get going one morning in their kitchen I noticed the sink faucet was dripping and remembered that it was dripping the last time I was there before and that in fact it had been dripping as long as I could remember. I commented on it and John said he had tried to fix it with a new faucet washer but it hadn't worked. That was all he said. The presumption left was that that was the end of the matter. If you try to fix a faucet and your fixing doesn't work then it's just your lot to live with a dripping faucet.

This made me wonder to myself if it got on their nerves, this drip-drip-drip, week in, week out, year in, year out, but I could not notice any irritation or concern about it on their part, and so concluded they just aren't bothered by things like dripping faucets. Some people aren't.

What it was that changed this conclusion, I don't remember—some intuition, some insight one day, perhaps it was a subtle change in Sylvia's mood whenever the dripping was particularly loud and she was trying to talk. She has a very soft voice. And one day when she was trying to talk above the dripping and the kids came in and interrupted her she lost her temper at them. It seemed that her anger at the kids would not have been nearly as great if the faucet hadn't also been dripping when she was trying to talk. It was the combined dripping and loud kids that blew her up. What struck me hard then was that she was not blaming the faucet, and that she was deliberately not blaming the faucet. She wasn't ignoring that faucet at all! She was suppressing anger at that faucet and that goddamned dripping faucet was just about killing her! But she could not admit the importance of this for some reason.

Why suppress anger at a dripping faucet? I wondered.

Then that patched in with the motorcycle maintenance and one of those light bulbs went on over my head and I thought, Ahhhhhhhh!

It's not the motorcycle maintenance, not the faucet. It's all of technology they can't take. And then all sorts of things started tumbling into place and I knew that was it. Sylvia's irritation at a friend who thought computer programming was "creative." All their drawings and paintings and photographs without a technological thing in them. Of course she's not going to get mad at that faucet, I thought. You always suppress momentary anger at something you deeply and permanently hate. Of course John signs off every time the subject of cycle repair comes up, even when it is obvious he is suffering for it. That's technology. And sure, of course, obviously. It's so simple when you see it. To get away from technology out into the country in the fresh air and sunshine is why they are on the motorcycle in the first place. For me to bring it back to them just at the point and place where they think they have finally escaped it just frosts both of them, tremendously. That's why the conversation always breaks and freezes when the subject comes up.

Other things fit in too. They talk once in a while in as few pained words as possible about "it" or "it all" as in the sentence, "There is just no escape from it." And if I asked, "From what?" the answer might be "The whole thing," or "The whole organized bit," or even "The system." Sylvia once said defensively, "Well, you know how to cope with it," which puffed me up so

much at the time I was embarrassed to ask what "it" was and so remained somewhat puzzled. I thought it was something more mysterious than technology. But now I see that the "it" was mainly, if not entirely, technology. But, that doesn't sound right either. The "it" is a kind of force that gives rise to technology, something undefined, but inhuman, mechanical, lifeless, a blind monster, a death force. Something hideous they are running from but know they can never escape. I'm putting it way too heavily here but in a less emphatic and less defined way this is what it is. Somewhere there are people who understand it and run it but those are technologists, and they speak an inhuman language when describing what they do. It's all parts and relationships of unheard-of things that never make any sense no matter how often you hear about them. And their things, their monster keeps eating up land and polluting their air and lakes, and there is no way to strike back at it, and hardly any way to escape it.

That attitude is not hard to come to. You go through a heavy industrial area of a large city and there it all is, the technology. In front of it are high barbed-wire fences, locked gates, signs saying NO TRESPASSING, and beyond, through sooty air, you see ugly strange shapes of metal and brick whose purpose is unknown, and whose masters you will never see. What it's for you don't know, and why it's there, there's no one to tell, and so all you can feel is alienated, estranged, as though you didn't belong there. Who owns and understands this doesn't want you around. All this technology has somehow made you a stranger in your own land. Its very shape and appearance and mysteriousness say, "Get out." You know there's an explanation for all this somewhere and what it's doing undoubtedly serves mankind in some indirect way but that isn't what you see. What you see is the NO TRESPASSING, KEEP OUT signs and not anything serving people but little people, like ants, serving these strange, incomprehensible shapes. And you think, even if I were a part of this, even if I were not a stranger, I would be just another ant serving the shapes. So the final feeling is hostile, and I think that's ultimately what's involved with this otherwise unexplainable attitude of John and Sylvia. Anything to do with valves and shafts and wrenches is a part of that dehumanized world, and they would rather not think about it. They don't want to get into it.

If this is so, they are not alone. There is no question that they have been following their natural feelings in this and not trying to imitate anyone. But many others are also following their natural feelings and not trying to imitate anyone and the natural feelings of very many people are similar on this matter; so that when you look at them collectively, as journalists do, you get the illusion of a mass movement, an antitechnological mass movement, an entire political antitechnological left emerging, looming up from apparently nowhere, saying, "Stop the technology. Have it somewhere else. Don't have it here." It is still restrained by a thin web of logic that points out that without the factories there are no jobs or standard of living. But there are human forces stronger than logic. There always have been, and if they become strong enough in their hatred of technology that web can break.

I disagree with them about cycle maintenance, but not because I am out of sympathy with their feelings about technology. I just think that their flight from and hatred of technology is self-defeating. The Buddha, the Godhead, resides quite as comfortably in the circuits of a digital computer or the gears of a cycle transmission as he does at the top of a mountain or in the petals of a flower. To think otherwise is to demean the Buddha...which is to demean oneself. That is what I want to talk about.

II

My motorcycle has an air-cooled engine, and when it grows to hot, the heat can cause a "seizure." This machine has had one—in fact, three of them. When I'm on the road, I check it

from time to time the same way I would check a patient who has had a heart attack, even though it seems cured.

In a seizure, the pistons expand from too much heat, become too big for the walls of the cylinders, seize them, melt to them sometimes, and lock the engine and rear wheel and start the whole cycle into a skid. The first time this one seized, my head was pitched over the front wheel and my passenger was almost on top of me. At about thirty it freed up again and started to run but I pulled off the road and stopped to see what was wrong. All my passenger could think to say was "What did you do that for?"

I shrugged and was as puzzled as he was, and stood there with the cars whizzing by, just staring. The engine was so hot the air around it shimmered and we could feel the heat radiate. When I put a wet finger on it, it sizzled like a hot iron and we rode home, slowly, with a new sound, a slap that meant the pistons no longer fit and an overhaul was needed.

I took this machine into a shop because I thought it wasn't important enough to justify getting into myself, having to learn all the complicated details and maybe having to order parts and special tools and all that time-dragging stuff when I could get someone else to do it in less time... sort of John's attitude.

The shop was a different scene from the ones I remembered. The mechanics, who had once all seemed like ancient veterans, now looked like children. A radio was going full blast and they were clowning around and talking and seemed not to notice me. When one of them finally came over he barely listened to the piston slap before saying, "Oh yeah. Tappets."

Tappets? I should have known then what was coming.

Two weeks later I paid their bill for 140 dollars, rode the cycle carefully at varying low speeds to wear it in and then after one thousand miles opened it up. At about seventy-five it seized again and freed at thirty, the same as before. When I brought it back they accused me of not breaking it in properly, but after much argument agreed to look into it. They overhauled it again and this time took it out themselves for a high-speed road test.

It seized on them this time.

After the third overhaul two months later they replaced the cylinders, put in oversize main carburetor jets, retarded the timing to make it run as coolly as possible and told me, "Don't run it fast."

It was covered with grease and did not start. I found the plugs were disconnected, connected them and started it, and now there really was a tappet noise. They hadn't adjusted them. I pointed this out and the kid came with an open-end adjustable wrench, set wrong, and swiftly rounded both of the sheet aluminum tappet covers, ruining both of them.

"I hope we've got some more of those in stock," he said.

I nodded.

He brought out a hammer and cold chisel and started to pound them loose. The chisel punched through the aluminum cover and I could see he was pounding the chisel right into the engine head. On the next blow he missed the chisel completely and struck the head with the hammer, breaking off a portion of two of the cooling fins.

"Just stop," I said politely, feeling this was a bad dream.

"Just give me some new covers and I'll take it the way it is."

I got out of there as fast as possible, noisy tappets, shot tappet covers, greasy machine, down the road, and then felt a bad vibration at speeds over twenty. At the curb I discovered two of the four engine-mounting bolts were missing and a nut was missing from the third. The whole engine was hanging on by only one bolt. The overhead-cam chain-tensioner bolt was also missing, meaning it would have been hopeless to try to adjust the tappets anyway. Nightmare.

The thought of John putting his motorcycle into the hands of one of those people is something I have never brought up with him. Maybe I should.

I found the cause of the seizures a few weeks later, waiting to happen again. It was a little twenty-five-cent pin in the internal oil-delivery system that had been sheared and was preventing oil from reaching the head at high speeds.

The question why comes back again and again and is a central part of what I want to explore here: Why did they butcher it so? These were not people running away from technology, like John and Sylvia. These were the technologists themselves. They sat down to do a job and they performed it like chimpanzees. Nothing personal in it. There was no obvious reason for it. And I tried to think back into that shop, that nightmare place, to try to remember anything that could have been the cause.

The radio was a clue. You can't really think hard about what you're doing and listen to the radio at the same time. Maybe they didn't see their job as having anything to do with hard thought, just wrench twiddling. If you can twiddle wrenches while listening to the radio that's more enjoyable.

Their speed was another clue. They were really slopping things around in a hurry and not looking where they slopped them. More money that way...if you don't stop to think that it usually takes longer or comes out worse.

But the biggest clue seemed to be their expressions. They were hard to explain. Good-natured, friendly, easygoing...and uninvolved. They were like spectators. You had the feeling they had just wandered in there themselves and somebody had handed them a wrench. There was no identification with the job. No saying, "I am a mechanic." At 5 P.M. or whenever their eight hours were in, you knew they would cut it off and not have another thought about their work. They were already trying not to have any thoughts about their work on the job. In their own way they were achieving the same thing John and Sylvia were, living with technology without really having anything to do with it. Or rather, they had something to do with it, but their own selves were outside of it, detached, removed. They were involved in it but not in such a way as to care.

Not only did these mechanics not find that sheared pin, but it was clearly a mechanic who had sheared it in the first place, by assembling the side cover plate improperly. I remembered the previous owner had said a mechanic had told him the plate was hard to get on. That was why. The shop manual had warned about this, but like the others he was probably in too much of a hurry or he didn't care.

While at work I was thinking about this same lack of care in the digital computer manuals I was editing. Writing and editing technical manuals is what I do for a living the other eleven months of the year and I knew they were full of errors, ambiguities, omissions and information so completely screwed up you had to read them six times to make any sense out of them. But what struck me for the first time was the agreement of these manuals with the spectator attitude I had seen in the shop. These were spectator manuals. It was built into the format of them. Implicit in every line is the idea that "Here is the machine, isolated in time and in space from everything else in the universe. It has no relationship to you, you have no relationship to it, other than to turn certain switches, maintain voltage levels, check for error conditions—" and so on. That's it. The mechanics in their attitude toward the machine were really taking no different attitude from the manual's toward the machine, or from the attitude I had when I brought it in there. We were all spectators. And it occurred to me there is no manual that deals with the real business of motorcycle maintenance, the most important aspect of all. Caring about what you are doing is considered either unimportant or taken for granted.

What I want to do here is to explore this a little, to see if in that strange separation of what man is from what man does we may have some clues as to what the hell has gone wrong in this twentieth century. I don't want to hurry it. That itself is a poisonous twentieth-century attitude. When you want to hurry something, that means you no longer care about it and want

to get on to other things. I just want to get at it slowly, but carefully and thoroughly, with the same attitude I remember was present just before I found that sheared pin. It was that attitude that found it, nothing else.

III

An old motorcycle engine like mine has a nickels-and-dimes sound to it. As if there were a lot of loose change flying around inside. Sounds awful, but it's just normal valve clatter. Once you get used to that sound and learn to expect it, you automatically hear any difference. If you don't hear any, that's good.

I tried to get John interested in that sound once but it was hopeless. All he heard was noise and all he saw was the machine and me with greasy tools in my hands, nothing else. That didn't work.

I was so baffled by John’s refusal even to think about any mechanical subject I kept searching for ways to clue him to the whole thing but didn't know where to start.

I thought I would wait until something went wrong with his machine and then I would help him fix it and that way get him into it, but I goofed that one myself because I didn't understand this difference in the way he looked at things.

He didn't really see what was going on and was not interested enough to find out. He isn't so interested in what things mean as in what they are. That's quite important, that he sees things this way. It took me a long time to see this difference and it's important that I make it clear.

His handlebars had started slipping. Not badly, he said, just a little when you shoved hard on them. I warned him not to use his adjustable wrench on the tightening nuts. It was likely to damage the chrome and start small rust spots. He agreed to use my metric sockets and box-ends.

When he brought his motorcycle over I got my wrenches out but then noticed that no amount of tightening would stop the slippage, because the ends of the collars were pinched shut.

"You're going to have to shim those out," I said.

"What's shim?"

"It's a thin, flat strip of metal. You just slip it around the handlebar under the collar there and it will open up the collar to where you can tighten it again. You use shims like that to make adjustments in all kinds of machines."

"Oh," he said. He was getting interested. "Good. Where do you buy them?"

"I've got some right here," I said gleefully, holding up a can of beer in my hand.

He didn't understand for a moment. Then he said, "What, the can?"

"Sure," I said, "best shim stock in the world."

I thought this was pretty clever myself. Save him a trip to God knows where to get shim stock. Save him time. Save him money.

But to my surprise he didn't see the cleverness of this at all. In fact he got noticeably haughty about the whole thing. Pretty soon he was dodging and filling with all kinds of excuses and, before I realized what his real attitude was, we had decided not to fix the handlebars after all.

As far as I know those handlebars are still loose. And I believe now that he was actually offended at the time. I had had the nerve to propose repair of his new eighteen-hundred dollar BMW, the pride of a half-century of German mechanical finesse, with a piece of old beer can!

Ach, du lieber!

Since then we have had very few conversations about motorcycle maintenance. None, now that I think of it.

You push it any further and suddenly you are angry, without knowing why.

I should say, to explain this, that beer-can aluminum is soft and sticky, as metals go. Perfect for the application. Aluminum doesn't oxidize in wet weather...or, more precisely, it always has a thin layer of oxide that prevents any further oxidation. Also perfect.

In other words, any true German mechanic, with a half-century of mechanical finesse behind him, would have concluded that this particular solution to this particular technical problem was perfect.

For a while I thought what I should have done was sneak over to the workbench, cut a shim from the beer can, remove the printing and then come back and tell him we were in luck, it was the last one I had, specially imported from Germany. That would have done it. A special shim from the private stock of Baron Alfred Krupp, who had to sell it at a great sacrifice. Then he would have gone gaga over it.

That Krupp's-private-shim fantasy gratified me for a while, but then it wore off and I saw it was just being vindictive. In its place grew that old feeling I've talked about before, a feeling that there's something bigger involved than is apparent on the surface. You follow these little discrepancies long enough and they sometimes open up into huge revelations. There was just a feeling on my part that this was something a little bigger than I wanted to take on without thinking about it, and I turned instead to my usual habit of trying to extract causes and effects to see what was involved that could possibly lead to such an impasse between John's view of that lovely shim and my own. This comes up all the time in mechanical work. A hang-up. You just sit and stare and think, and search randomly for new information, and go away and come back again, and after a while the unseen factors start to emerge.

What emerged in vague form at first and then in sharper outline was the explanation that I had been seeing that shim in a kind of intellectual, rational, cerebral way in which the scientific properties of the metal were all that counted. John was going at it immediately and intuitively, grooving on it. I was going at it in terms of underlying form. He was going at it in terms of immediate appearance. I was seeing what the shim meant. He was seeing what the shim was. That's how I arrived at that distinction. And when you see what the shim is, in this case, it's depressing. Who likes to think of a beautiful precision machine fixed with an old hunk of junk?

I guess I forgot to mention John is a musician, a drummer, who works with groups all over town and makes a pretty fair income from it. I suppose he just thinks about everything the

way he thinks about drumming...which is to say he doesn't really think about it at all. He just does it. Is with it. He just responded to fixing his motorcycle with a beer can the way he would respond to someone dragging the beat while he was playing. It just did a big thud with him and that was it. He didn't want any part of it.

At first this difference seemed fairly minor, but then it grew -- and grew -- and grew -- until I began to see why I missed it. Some things you miss because they're so tiny you overlook them. But some things you don't see because they're so huge. We were both looking at the same thing, seeing the same thing, talking about the same thing, thinking about the same thing, except he was looking, seeing, talking and thinking from a completely different dimension.

He really does care about technology. It's just that in this other dimension he gets all screwed up and is rebuffed by it. It just won't swing for him. He tries to swing it without any rational premeditation and botches it and botches it and botches it and after so many botches gives up and just kind of puts a blanket curse on that whole nuts-and-bolts scene. He will not or cannot believe there is anything in this world for which grooving is not the way to go.

That's the dimension he's in. The *groovy* dimension. I'm being awfully *square* talking about all this mechanical stuff all the time. It's all just parts and relationships and analyses and syntheses and figuring things out and it isn't really here. It's somewhere else, which thinks it's here, but's a million miles away. This is what it's all about. He's on this dimensional difference which underlay much of the cultural changes of the sixties, I think, and is still in the process of reshaping our whole national outlook on things. The "generation gap" has been a result of it. The names "beat" and "hip" grew out of it. Now it's become apparent that this dimension isn't a fad that's going to go away next year or the year after. It's here to stay because it's a very serious and important way of looking at things that looks incompatible with reason and order and responsibility but actually is not. Now we are down to the root of things.

What we have here is a conflict of visions of reality. The world as you see it right here, right now, is reality, regardless of what the scientists say it might be. That's the way John sees it. But the world as revealed by its scientific discoveries is also reality, regardless of how it may appear, and people in John's dimension are going to have to do more than just ignore it if they want to hang on to their vision of reality. John will discover this if his cycle, a BMW R60, famed for not giving mechanical problems on the road, should fail him after all.

That's really why he got upset that day when he couldn't get his engine started. It was an intrusion on his reality. It just blew a hole right through his whole groovy way of looking at things and he would not face up to it because it seemed to threaten his whole life style. In a way he was experiencing the same sort of anger scientific people have sometimes about abstract art, or at least used to have. That didn't fit their life style either.

What you've got here, really, are two realities, one of immediate artistic appearance and one of underlying scientific explanation, and they don't match and they don't fit and they don't really have much of anything to do with one another. That's quite a situation. You might say there's a little problem here.

IV

The problem is, then, where to start. To reach people like the Sutherlands you have to back up and back up, and the further back you go, the further back you see you have to go, until what looked like a small problem of communication turns into a major philosophic enquiry.

I mentioned the "shapes" of technology, the "death force" that the Sutherlands seem to be running from. Now, I want to move in the opposite direction from the Sutherlands, toward that force and into its center, where all understanding is in terms of underlying form.

The world of underlying form is an unusual object of discussion because it is actually a mode of discussion itself. You discuss things in terms of their immediate appearance or you discuss them in terms of their underlying form, and when you try to discuss these modes of discussion you get involved in what could be called a platform problem. You have no platform from which to discuss them other than the modes themselves.

Previously I was discussing this world of underlying form, or at least the aspect of it called technology, from an external view. Now I think it's right to talk about that world of underlying form from its own point of view. I want to talk about the underlying form of the world of underlying form itself.

To do this, first of all, a dichotomy is necessary, but before I can use it honestly I have to back up and say what it is and means, and that is a long story in itself. Part of this problem of where to start. But right now I just want to use a dichotomy and explain it later. I want to divide human understanding into two kinds...classical understanding and romantic understanding. In terms of ultimate truth a dichotomy of this sort has little meaning but it is quite legitimate when one is operating within the classic mode used to discover or create a world of underlying form. The terms classic and romantic, as I use them, mean the following:

A classical understanding sees the world primarily as underlying form itself. A romantic understanding sees it primarily in terms of immediate appearance. If you were to show an engine or a mechanical drawing or electronic schematic to a romantic it is unlikely he would see much of interest in it. It has no appeal because the reality he sees is its surface. Dull, complex lists of names, lines and numbers. Nothing interesting. But if you were to show the same blueprint or schematic or give the same description to a classical person he might look at it and then become fascinated by it because he sees that within the lines and shapes and symbols is a tremendous richness of underlying form.

The romantic mode is primarily inspirational, imaginative, creative, intuitive. Feelings rather than facts predominate. "Art" when it is opposed to "Science" is often romantic. It does not proceed by reason or by laws. It proceeds by feeling, intuition and esthetic conscience. In the northern European cultures the romantic mode is usually associated with femininity, but this is certainly not a necessary association.

The classic mode, by contrast, proceeds by reason and by laws...which are themselves underlying forms of thought and behavior. In the European cultures it is primarily a masculine mode and the fields of science, law and medicine are unattractive to women largely for this reason. Although motorcycle riding is romantic, motorcycle maintenance is purely classic. The dirt, the grease, the mastery of underlying form required all give it such a negative romantic appeal that women never go near it.

Although surface ugliness is often found in the classic mode of understanding it is not inherent in it. There is a classic esthetic which romantics often miss because of its subtlety. The classic style is straightforward, unadorned, unemotional, economical and carefully proportioned. Its purpose is not to inspire emotionally, but to bring order out of chaos and make the unknown

known. It is not an esthetically free and natural style. It is esthetically restrained. Everything is under control. Its value is measured in terms of the skill with which this control is maintained.

To a romantic this classic mode often appears dull, awkward and ugly, like mechanical maintenance itself. Everything is in terms of pieces and parts and components and relationships. Nothing is figured out until it's run through the computer a dozen times. Everything's got to be measured and proved. Oppressive. Heavy. Endlessly grey. The death force.

Within the classic mode, however, the romantic has some appearances of his own. Frivolous, irrational, erratic, untrustworthy, interested primarily in pleasure-seeking. Shallow. Of no substance. Often a parasite who cannot or will not carry his own weight. A real drag on society. By now these battle lines should sound a little familiar.

This is the source of the trouble. Persons tend to think and feel exclusively in one mode or the other and in doing so tend to misunderstand and underestimate what the other mode is all about. But no one is willing to give up the truth as he sees it, and as far as I know, no one now living has any real reconciliation of these truths or modes. There is no point at which these visions of reality are unified.

And so in recent times we have seen a huge split develop between a classic culture and a romantic counterculture...two worlds growingly alienated and hateful toward each other with everyone wondering if it will always be this way, a house divided against itself. No one wants it really... despite what his antagonists in the other dimension might think.

The classic mode of rationality has been used since antiquity to remove oneself from the tedium and depression of one's immediate surroundings. What makes it hard to see is that where once it was used to get away from it all, the escape has been so successful that now it is the "it all" that the romantics are trying to escape. What makes this classic world so hard to see clearly is not its strangeness but its usualness. Familiarity can blind you too.

The classic mode of looking at things produces a kind of description that can be called an "analytic" description from which one discusses things in terms of their underlying form. And to give a fuller description of what this is I want now to turn this analytic approach back upon itself...to analyze analysis itself. I want to do this first of all by giving an extensive example of it and then by dissecting what it is. The motorcycle is a perfect subject for it since the motorcycle itself was invented by classic minds. So listen:

A motorcycle may be divided for purposes of classical rational analysis by means of its component assemblies and by means of its functions.

If divided by means of its component assemblies, its most basic division is into a power assembly and a running assembly.

The power assembly may be divided into the engine and the power-delivery system. The engine will be taken up first.

The engine consists of a housing containing a power train, a fuel-air system, an ignition system, a feedback system and a lubrication system.

The power train consists of cylinders, pistons, connecting rods, a crankshaft and a flywheel.

The fuel-air system components, which are part of the engine, consist of a gas tank and filter, an air cleaner, a carburetor, valves and exhaust pipes.

The ignition system consists of an alternator, a rectifier, a battery, a high-voltage coil and spark plugs.

The feedback system consists of a cam chain, a camshaft, tappets and a distributor.

The lubrication system consists of an oil pump and channels throughout the housing for distribution of the oil.

The power-delivery system accompanying the engine consists of a clutch, a transmission and a chain.

The supporting assembly accompanying the power assembly consists of a frame, including foot pegs, seat and fenders; a steering assembly; front and rear shock absorbers; wheels; control levers and cables; lights and horn; and speed and mileage indicators.

That’s a motorcycle divided according to its components. To know what the components are for, a division according to functions is necessary:

A motorcycle may be divided into normal running functions and special, operator-controlled functions.

Normal running functions may be divided into functions during the intake cycle, functions during the compression cycle, functions during the power cycle and functions during the exhaust cycle.

And so on. I could go on about which functions occur in their proper sequence during each of the four cycles, then go on to the operator-controlled functions and that would be a very summary description of the underlying form of a motorcycle. It would be extremely short and rudimentary, as descriptions of this sort go. Almost any one of the components mentioned can be expanded on indefinitely. I’ve read an entire engineering volume on contact points alone, which are just a small but vital part of the distributor. There are other types of engines than the single-cylinder Otto engine described here: two-cycle engines, multiple-cylinder engines, diesel engines, Wankel engines...but this example is enough.

This description would cover the "what" of the motorcycle in terms of components, and the "how" of the engine in terms of functions. It would badly need a "where" analysis in the form of an illustration, and also a "why" analysis in the form of engineering principles that led to this particular conformation of parts. But the purpose here isn’t exhaustively to analyze the motorcycle. It’s to provide a starting point, an example of a mode of understanding of things which will itself become an object of analysis.

There’s certainly nothing strange about this description at first hearing. It sounds like something from a beginning textbook on the subject, or perhaps a first lesson in a vocational course. What is unusual about it is seen when it ceases to be a mode of discourse and becomes an object of discourse. Then certain things can be pointed to.

The first thing to be observed about this description is so obvious you have to hold it down or it will drown out every other observation. This is: It is just duller than ditchwater. Yah-da, yah-da, yah-da, yah-da, yah, carburetor, gear ratio, compression, yah-da-yah, piston, plugs,

intake, yah-da-yah, on and on and on. That is the romantic face of the classic mode. Dull, awkward and ugly. Few romantics get beyond that point.

But if you can hold down that most obvious observation, some other things can be noticed that do not at first appear.

The first is that the motorcycle, so described, is almost impossible to understand unless you already know how one works. The immediate surface impressions that are essential for primary understanding are gone. Only the underlying form is left.

The second is that the observer is missing. The description doesn't say that to see the piston you must remove the cylinder head. "You" aren't anywhere in the picture. Even the "operator" is a kind of personalityless robot whose performance of a function on the machine is completely mechanical. There are no real subjects in this description. Only objects exist that are independent of any observer.

The third is that the words "good" and "bad" and all their synonyms are completely absent. No value judgments have been expressed anywhere, only facts.

The fourth is that there is a knife moving here. A very deadly one; an intellectual scalpel so swift and so sharp you sometimes don't see it moving. You get the illusion that all those parts are just there and are being named as they exist. But they can be named quite differently and organized quite differently depending on how the knife moves.

For example, the feedback mechanism which includes the camshaft and cam chain and tappets and distributor exists only because of an unusual cut of this analytic knife. If you were to go to a motorcycle-parts department and ask them for a feedback assembly they wouldn't know what the hell you were talking about. They don't split it up that way. No two manufacturers ever split it up quite the same way and every mechanic is familiar with the problem of the part you can't buy because you can't find it because the manufacturer considers it a part of something else.

It is important to see this knife for what it is and not to be fooled into thinking that motorcycles or anything else are the way they are just because the knife happened to cut it up that way. It is important to concentrate on the knife itself. Later I will want to show how an ability to use this knife creatively and effectively can result in solutions to the classic and romantic split. By using the terms "classic" and "romantic" in this specific context, I am wielding that knife.

The application of this knife, the division of the world into parts and the building of this structure, is something everybody does. All the time we are aware of millions of things around us...these changing shapes, these burning hills, the sound of the engine, the feel of the throttle, each rock and weed and fence post and piece of debris beside the road...aware of these things but not really conscious of them unless there is something unusual or unless they reflect something we are predisposed to see. We could not possibly be conscious of these things and remember all of them because our mind would be so full of useless details we would be unable to think. From all this awareness we must select, and what we select and call consciousness is never the same as the awareness because the process of selection mutates it. We take a handful of sand from the endless landscape of awareness around us and call that handful of sand the world.

Once we have the handful of sand, the world of which we are conscious, a process of discrimination goes to work on it. This is the knife. We divide the sand into parts. This and

that. Here and there. Black and white. Now and then. The discrimination is the division of the conscious universe into parts.

The handful of sand looks uniform at first, but the longer we look at it the more diverse we find it to be. Each grain of sand is different. No two are alike. Some are similar in one way, some are similar in another way, and we can form the sand into separate piles on the basis of this similarity and dissimilarity. Shades of color in different piles...sizes in different piles...grain shapes in different piles...subtypes of grain shapes in different piles...grades of opacity in different piles...and so on, and on, and on. You'd think the process of subdivision and classification would come to an end somewhere, but it doesn't. It just goes on and on.

Classical understanding is concerned with the piles and the basis for sorting and interrelating them. Romantic understanding is directed toward the handful of sand before the sorting begins. Both are valid ways of looking at the world although irreconcilable with each other.

What has become an urgent necessity is a way of looking at the world that does violence to neither of these two kinds of understanding and unites them into one. Such an understanding will not reject sand-sorting or contemplation of unsorted sand for its own sake. Such an understanding will instead seek to direct attention to the endless landscape from which the sand is taken.

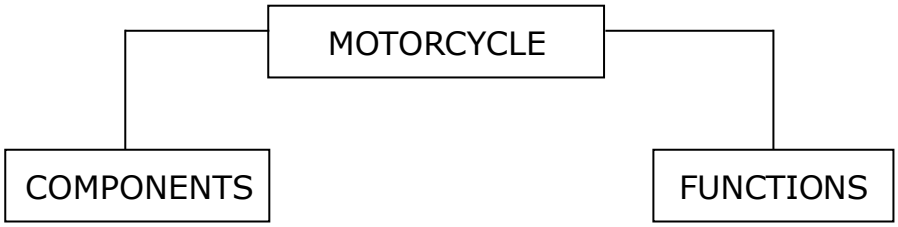
There is a perennial classical question that asks which grain of sand in which pile, is the Buddha. Obviously to ask that question is to look in the wrong direction, for the Buddha is everywhere. But just as obviously to ask that question is to look in the right direction, for the Buddha is everywhere. About the Buddha that exists independently of any analytic thought much has been said...some would say too much, and would question any attempt to add to it. But about the Buddha that exists within analytic thought, and gives that analytic thought its direction, virtually nothing has been said, and there are historic reasons for this. But history keeps happening, and it seems no harm and maybe some positive good to add to our historical heritage with some talk in this area of discourse.

When analytic thought, the knife, is applied to experience, something is always killed in the process. That is fairly well understood, at least in the arts. Mark Twain's experience comes to mind, in which, after he had mastered the analytic knowledge needed to pilot the Mississippi River, he discovered the river had lost its beauty. Something is always killed. But what is less noticed in the arts...something is always created too. And instead of just dwelling on what is killed it's important also to see what's created and to see the process as a kind of death-birth continuity that is neither good nor bad, but just is.

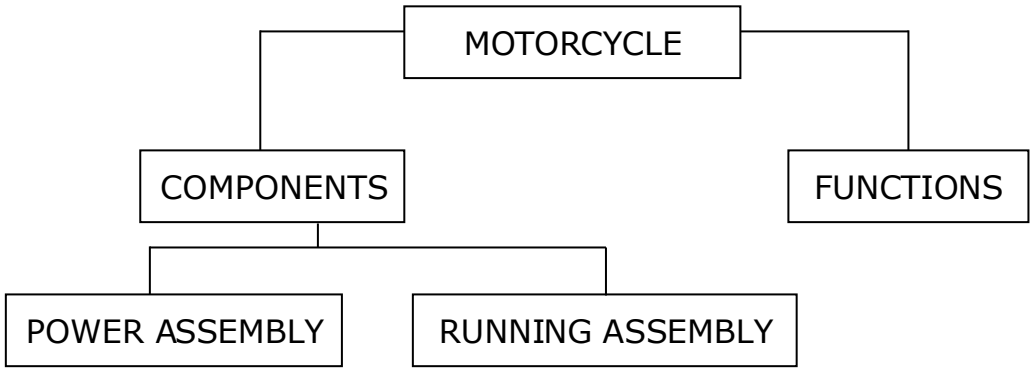
V

Precision instruments are designed to achieve an idea, dimensional precision, whose perfection is impossible. There is no perfectly shaped part of the motorcycle and never will be, but when you come as close as these instruments take you, remarkable things happen, and you go flying across the countryside under a power that would be called magic if it were not so completely rational in every way. It's the understanding of this rational intellectual idea that's fundamental. John looks at the motorcycle and he sees steel in various shapes and has negative feelings about these steel shapes and turns off the whole thing. I look at the shapes of the steel now and I see ideas. He thinks I'm working on parts. I'm working on concepts.

I was talking about these concepts yesterday when I said that a motorcycle can be divided according to its components and according to its functions. When I said that suddenly I created a set of boxes with the following arrangement:



And when I said the components may be subdivided into a power assembly and a running assembly, suddenly appear some more little boxes:



And you see that every time I made a further division, up came more boxes based on these divisions until I had a huge pyramid of boxes. Finally you see that while I was splitting the cycle up into finer and finer pieces, I was also building a structure.

This structure of concepts is formally called a hierarchy and since ancient times has been a basic structure for all Western knowledge. Kingdoms, empires, churches, armies have all been structured into hierarchies. Modern businesses are so structured. Tables of contents of reference material are so structured, mechanical assemblies, computer software, all scientific and technical knowledge is so structured... so much so that in some fields such as biology, the hierarchy of kingdom-phylum-class-order-family-genus-species is almost an icon.

The box "motorcycle" contains the boxes "components" and "functions." The box "components" contains the boxes "power assembly" and "running assembly," and so on. There are many other kinds of structures produced by other operators such as "causes" which produce long chain structures of the form, "A causes B which causes C which causes D," and so on. A functional description of the motorcycle uses this structure. The operator’s "exists," "equals," and "implies" produce still other structures. These structures are normally interrelated in patterns and paths so complex and so enormous no one person can understand more than a

small part of them in his lifetime. The overall name of these interrelated structures, the genus of which the hierarchy of containment and structure of causation are just species, is system. The motorcycle is a system. A real system.

To speak of certain government and establishment institutions as "the system" is to speak correctly, since these organizations are founded upon the same structural conceptual relationships as a motorcycle. They are sustained by structural relationships even when they have lost all other meaning and purpose. People arrive at a factory and perform a totally meaningless task from eight to five without question because the structure demands that it be that way. There's no villain, no "mean guy" who wants them to live meaningless lives, it's just that the structure, the system demands it and no one is willing to take on the formidable task of changing the structure just because it is meaningless.

But to tear down a factory or to revolt against a government or to avoid repair of a motorcycle because it is a system is to attack effects rather than causes; and as long as the attack is upon effects only, no change is possible. The true system, the real system, is our present construction of systematic thought itself, rationality itself, and if a factory is torn down but the rationality which produced it is left standing, then that rationality will simply produce another factory. If a revolution destroys a systematic government, but the systematic patterns of thought that produced that government are left intact, then those patterns will repeat themselves in the succeeding government. There's so much talk about the system. And so little understanding.

That's all the motorcycle is, a system of concepts worked out in steel. There's no part in it, no shape in it, that is not out of someone's mind—number three tappet is right on too. One more to go. This had better be it ...I've noticed that people who have never worked with steel have trouble seeing this... that the motorcycle is primarily a mental phenomenon. They associate metal with given shapes... pipes, rods, girders, tools, parts... all of them fixed and inviolable, and think of it as primarily physical. But a person who does machining or foundry work or forge work or welding sees "steel" as having no shape at all. Steel can be any shape you want if you are skilled enough, and any shape but the one you want if you are not. Shapes, like this tappet, are what you arrive at, what you give to the steel. Steel has no more shape than this old pile of dirt on the engine here. These shapes are all out of someone's mind. That's important to see. The steel? Hell, even the steel is out of someone's mind. There's no steel in nature. Anyone from the Bronze Age could have told you that. All nature has is a potential for steel. There's nothing else there. But what's "potential"? That's also in someone's mind! Like ghosts!

It sounds insane when you just jump up and say that "it's all in the mind" without reference to anything specific like an engine. But when you tie it down to something specific and concrete, the insane sound tends to disappear.

VI

In exploring rationality itself, that dull, complex, classical ghost of underlying form, I have talked about hierarchies of thought... the system. Now I want to talk about methods of finding one's way through these hierarchies... logic.

Two kinds of logic are used, inductive and deductive. Inductive inferences start with observations of the machine and arrive at general conclusions. For example, if the cycle goes over a bump and the engine misfires, and then goes over another bump and the engine misfires, and then goes over another bump and the engine misfires, and then goes over a long smooth stretch of road and there is no misfiring, and then goes over a fourth bump and the engine misfires again, one can logically conclude that the misfiring is caused by the bumps. That is induction: reasoning from particular experiences to general truths.

Deductive inferences do the reverse. They start with general knowledge and predict a specific observation. For example, if, from reading the hierarchy of facts about the machine, the mechanic knows the horn of the cycle is powered exclusively by electricity from the battery, then he can logically infer that if the battery is dead the horn will not work. That is deduction.

Solution of problems too complicated for common sense to solve is achieved by long strings of mixed inductive and deductive inferences that weave back and forth between the observed machine and the mental hierarchy of the machine found in the manuals. The correct program for this interweaving is formalized as scientific method.

Actually I've never seen a cycle-maintenance problem complex enough really to require full-scale formal scientific method. Repair problems are not that hard. When I think of formal scientific method an image sometimes comes to mind of an enormous juggernaut, a huge bulldozer...slow, tedious lumbering, laborious, but invincible. It takes twice as long, five times as long, maybe a dozen times as long as informal mechanic's techniques, but you know in the end you're going to get it. There's no fault isolation problem in motorcycle maintenance that can stand up to it. When you've hit a really tough one, tried everything, racked your brain and nothing works, and you know that this time Nature has really decided to be difficult, you say, "Okay, Nature, that's the end of the nice guy," and you crank up the formal scientific method.

For this you keep a lab notebook. Everything gets written down, formally, so that you know at all times where you are, where you've been, where you're going and where you want to get. In scientific work and electronics technology this is necessary because otherwise the problems get so complex you get lost in them and confused and forget what you know and what you don't know and have to give up. In cycle maintenance things are not that involved, but when confusion starts it's a good idea to hold it down by making everything formal and exact. Sometimes just the act of writing down the problems straightens out your head as to what they really are.

The logical statements entered into the notebook are broken down into six categories: (1) statement of the problem, (2) hypotheses as to the cause of the problem, (3) experiments designed to test each hypothesis, (4) predicted results of the experiments, (5) observed results of the experiments and (6) conclusions from the results of the experiments. This is not different from the formal arrangement of many college and high-school lab notebooks but the purpose here is no longer just busywork. The purpose now is precise guidance of thoughts that will fail if they are not accurate.

The real purpose of scientific method is to make sure Nature hasn't misled you into thinking you know something you don't actually know. There's not a mechanic or scientist or technician alive who hasn't suffered from that one so much that he's not instinctively on guard. That's the main reason why so much scientific and mechanical information sounds so dull and so cautious. If you get careless or go romanticizing scientific information, giving it a flourish here and there, Nature will soon make a complete fool out of you. It does it often enough anyway even when you don't give it opportunities. One must be extremely careful and rigidly logical when dealing with Nature: one logical slip and an entire scientific edifice comes tumbling down. One false deduction about the machine and you can get hung up indefinitely.

In Part One of formal scientific method, which is the statement of the problem, the main skill is in stating absolutely no more than you are positive you know. It is much better to enter a statement "Solve Problem: Why doesn't cycle work?" which sounds dumb but is correct, than it is to enter a statement "Solve Problem: What is wrong with the electrical system?" when you don't absolutely know the trouble is in the electrical system. What you should state is "Solve Problem: What is wrong with cycle?" and then state as the first entry of Part Two: "Hypothesis Number One: The trouble is in the electrical system." You think of as many hypotheses as you can, then you design experiments to test them to see which are true and which are false.

This careful approach to the beginning questions keeps you from taking a major wrong turn which might cause you weeks of extra work or can even hang you up completely. Scientific questions often have a surface appearance of dumbness for this reason. They are asked in order to prevent dumb mistakes later on.

Part Three, that part of formal scientific method called experimentation, is sometimes thought of by romantics as all of science itself because that's the only part with much visual surface. They see lots of test tubes and bizarre equipment and people running around making discoveries. They do not see the experiment as part of a larger intellectual process and so they often confuse experiments with demonstrations, which look the same. A man conducting a gee-whiz science show with fifty thousand dollars' worth of Frankenstein equipment is not doing anything scientific if he knows beforehand what the results of his efforts are going to be. A motorcycle mechanic, on the other hand, who honks the horn to see if the battery works is informally conducting a true scientific experiment. He is testing a hypothesis by putting the question to nature. The TV scientist who mutters sadly, "The experiment is a failure; we have failed to achieve what we had hoped for," is suffering mainly from a bad scriptwriter. An experiment is never a failure solely because it fails to achieve predicted results. An experiment is a failure only when it also fails adequately to test the hypothesis in question, when the data it produces don't prove anything one way or another.

Skill at this point consists of using experiments that test only the hypothesis in question, nothing less, nothing more. If the horn honks, and the mechanic concludes that the whole electrical system is working, he is in deep trouble. He has reached an illogical conclusion. The honking horn only tells him that the battery and horn are working. To design an experiment properly he has to think very rigidly in terms of what directly causes what. This you know from the hierarchy. The horn doesn't make the cycle go. Neither does the battery, except in a very indirect way. The point at which the electrical system directly causes the engine to fire is at the spark plugs, and if you don't test here, at the output of the electrical system, you will never really know whether the failure is electrical or not.

To test properly the mechanic removes the plug and lays it against the engine so that the base around the plug is electrically grounded, kicks the starter lever and watches the spark plug gap for a blue spark. If there isn't any he can conclude one of two things: (a) there is an electrical failure or (b) his experiment is sloppy. If he is experienced he will try it a few more times, checking connections, trying every way he can think of to get that plug to fire. Then, if he can't get it to fire, he finally concludes that a is correct, there's an electrical failure, and the experiment is over. He has proved that his hypothesis is correct.

In the final category, conclusions, skill comes in stating no more than the experiment has proved. It hasn't proved that when he fixes the electrical system the motorcycle will start. There may be other things wrong. But he does know that the motorcycle isn't going to run until the electrical system is working and he sets up the next formal question: "Solve problem: what is wrong with the electrical system?"

He then sets up hypotheses for these and tests them. By asking the right questions and choosing the right tests and drawing the right conclusions the mechanic works his way down the echelons of the motorcycle hierarchy until he has found the exact specific cause or causes of the engine failure, and then he changes them so that they no longer cause the failure.

An untrained observer will see only physical labor and often get the idea that physical labor is mainly what the mechanic does. Actually the physical labor is the smallest and easiest part of what the mechanic does. By far the greatest part of his work is careful observation and precise thinking. That is why mechanics sometimes seem so taciturn and withdrawn when performing tests. They don't like it when you talk to them because they are concentrating on mental images, hierarchies, and not really looking at you or the physical motorcycle at all. They are using the experiment as part of a program to expand their hierarchy of knowledge of the faulty motorcycle and compare it to the correct hierarchy in their mind. They are looking at underlying form.

VII

One of the main proponents and believers in the scientific method, and the the classic rationality and the logic it adheres to, was the Scottish philosopher David Hume. Hume submitted that if one follows the strictest rules of logical induction and deduction from experience to determine the true nature of the world, one must arrive at certain conclusions. His reasoning followed lines that would result from answers to this question: Suppose a child is born devoid of all senses; he has no sight, no hearing, no touch, no smell, no taste...nothing. There's no way whatsoever for him to receive any sensations from the outside world. And suppose this child is fed intravenously and otherwise attended to and kept alive for eighteen years in this state of existence. The question is then asked: Does this eighteen-year-old person have a thought in his head? If so, where does it come from? How does he get it?

Hume would have answered that the eighteen-year-old had no thoughts whatsoever, and in giving this answer would have defined himself as an empiricist, one who believes all knowledge is derived exclusively from the senses. The scientific method of experimentation is carefully controlled empiricism. Common sense today is empiricism, since an overwhelming majority would agree with Hume, even though in other cultures and other times a majority might have differed.

The first problem of empiricism, if empiricism is believed, concerns the nature of "substance." If all our knowledge comes from sensory data, what exactly is this substance which is supposed to give off the sensory data itself? If you try to imagine what this substance is, apart from what is sensed, you'll find yourself thinking about nothing whatsoever.

Since all knowledge comes from sensory impressions and since there's no sensory impression of substance itself, it follows logically that there is no knowledge of substance. It's just something we imagine. It's entirely within our own minds. The idea that there's something out there giving off the properties we perceive is just another of those common-sense notions similar to the common-sense notion children have that the earth is flat and parallel lines never meet.

Secondly, if one starts with the premise that all our knowledge comes to us through our senses, one must ask, From what sense data is our knowledge of causation received? In other words, what is the scientific empirical basis of causation itself?

Hume's answer is "None." There's no evidence for causation in our sensations. Like substance, it's just something we imagine when one thing repeatedly follows another. It has no real existence in the world we observe. If one accepts the premise that all knowledge comes to us through our senses, Hume says, then one must logically conclude that both "Nature" and "Nature's laws" are creations of our own imagination.

This idea that the entire world is within one's own mind could be dismissed as absurd if Hume had just thrown it out for speculation. But he was making it an airtight case.

Reading Hume's work, the German philosopher Immanuel Kant realized that it would be necessary to throw out Hume's conclusions. But Kant also found that unfortunately Hume had arrived at them in such a way that it was seemingly impossible to throw them out without abandoning empirical reason itself and retiring into some medieval predecessor of empirical reason.

This Kant would not do. Thus it was Hume, Kant said, who "aroused me from my dogmatic slumbers" and caused him to write what is now regarded as one of the greatest philosophical treatises ever written, the Critique of Pure Reason, often the subject of an entire University course.

In his Critique, Kant is trying to save scientific empiricism from the consequences of its own self-devouring logic. He starts out at first along the path that Hume has set before him. "That all our knowledge begins with experience there can be no doubt," he said, but he soon departs from the path by denying that all components of knowledge come from the senses at the moment the sense data are received. "But though all knowledge begins with experience it doesn't follow that it arises out of experience."

This seems, at first, as though he is picking nits, but he isn't. As a result of this difference, Kant skirts right around the abyss of solipsism that Hume's path leads to and proceeds on an entirely new and different path of his own.

Kant says there are aspects of reality which are not supplied immediately by the senses. These he calls a priori. An example of a priori knowledge is "time." You don't see time. Neither do you hear it, smell it, taste it or touch it. It isn't present in the sense data as they are received. Time is what Kant calls an "intuition," which the mind must supply as it receives the sense data.

The same is true of space. Unless we apply the concepts of space and time to the impressions we receive, the world is unintelligible, just a kaleidoscopic jumble of colors and patterns and noises and smells and pain and tastes without meaning. We sense objects in a certain way because of our application of a priori intuitions such as space and time, but we do not create these objects out of our imagination, as pure philosophical idealists would maintain. The forms of space and time are applied to data as they are received from the object producing them. The a priori concepts have their origins in human nature so that they're neither caused by the sensed object nor bring it into being, but provide a kind of screening function for what sense data we will accept. When our eyes blink, for example, our sense data tell us that the world has disappeared. But this is screened out and never gets to our consciousness because we have in our minds an a priori concept that the world has continuity. What we think of as reality is a continuous synthesis of elements from a fixed hierarchy of a priori concepts and the ever changing data of the senses. Now stop and apply some of the concepts Kant has put forth to

this strange machine, this creation that's been bearing us along through time and space. See our relation to it now, as Kant reveals it to us.

Hume has been saying, in effect, that everything I know about this motorcycle comes to me through my senses. It has to be. There's no other way. If I say it's made of metal and other substances, he asks, What's metal? If I answer that metal's hard and shiny and cold to the touch and deforms without breaking under blows from a harder material, Hume says those are all sights and sounds and touch. There's no substance. Tell me what metal is apart from these sensations. Then, of course, I'm stuck.

But if there's no substance, what can we say about the sense data we receive? If I hold my head to the left and look down at the handle grips and front wheel and map carrier and gas tank I get one pattern of sense data. If I move my head to the right I get another slightly different pattern of sense data. The two views are different. The angles of the planes and curves of the metal are different. The sunlight strikes them differently. If there's no logical basis for substance then there's no logical basis for concluding that what's produced these two views is the same motorcycle.

Now we've a real intellectual impasse. Our reason, which is supposed to make things more intelligible, seems to be making them less intelligible, and when reason thus defeats its own purpose something has to be changed in the structure of our reason itself.

Kant comes to our rescue. He says that the fact that there's no way of immediately sensing a "motorcycle," as distinguished from the colors and shapes a motorcycle produces, is no proof at all that there's no motorcycle there. We have in our minds an a priori motorcycle which has continuity in time and space and is capable of changing appearance as one moves one's head and is therefore not contradicted by the sense data one is receiving.

Hume's motorcycle, the one that makes no sense at all, will occur if our previous hypothetical bed patient, the one who has no senses at all, is suddenly, for one second only, exposed to the sense data of a motorcycle, then deprived of his senses again. Now, I think, in his mind he would have a Hume motorcycle, which provides him with no evidence whatsoever for such concepts as causation.

But, as Kant says, we are not that person. We have in our minds a very real a priori motorcycle whose existence we have no reason to doubt, whose reality can be confirmed anytime.

This a priori motorcycle has been built up in our minds over many years from enormous amounts of sense data and it is constantly changing as new sense data come in. Some of the changes in this specific a priori motorcycle I'm riding are very quick and transitory, such as its relationship to the road. This I'm monitoring and correcting all the time as we take these curves and bends in the road. As soon as the information's of no more value I forget it because there's more coming in that must be monitored. Other changes in this a priori are slower: Disappearance of gasoline from the tank. Disappearance of rubber from the tires. Loosening of bolts and nuts. Change of gap between brake shoes and drums. Other aspects of the motorcycle change so slowly they seem permanent...the paint job, the wheel bearings, the control cables...yet these are constantly changing too. Finally, if one thinks in terms of really large amounts of time even the frame is changing slightly from the road shocks and thermal changes and forces of internal fatigue common to all metals.

It's quite a machine, this a priori motorcycle. If you stop to think about it long enough you'll see that it's the main thing. The sense data confirm it but the sense data aren't it. The motorcycle that I believe in an a priori way to be outside of myself is like the money I believe I

have in the bank. If I were to go down to the bank and ask to see my money they would look at me a little peculiarly. They don't have "my money" in any little drawer that they can pull open to show me. "My money" is nothing but some east-west and north-south magnetic domains in some iron oxide resting in a computer hard drive. But I'm satisfied with this because I've faith that if I need the things that money enables, the bank will provide the means, through their checking system, of getting it. Similarly, even though my sense data have never brought up anything that could be called "substance" I'm satisfied that there's a capability within the sense data of achieving the things that substance is supposed to do, and that the sense data will continue to match the a priori motorcycle of my mind. I say for the sake of convenience that I've money in the bank and say for the sake of convenience that substances compose the cycle I'm riding on.

VIII

Deweese, a friend of mine, is a painter. An abstract impressionist. Unlike the Sutherlands, who hate technology, DeWeese is so far removed from it he do not feel it any particular menace. DeWeese is actually a technology buff, a patron of the technologies. He doesn't understand them, but he knows what he likes, and he always enjoyed learning more.

I remember once at a party at DeWeese's house, he brought out some instructions for assembly of an outdoor barbecue rotisserie which he wants me to evaluate as a professional technical writer. He's spent a whole afternoon trying to get the thing together and he wants to see these instructions totally damned.

But as I read them they look like ordinary instructions to me and I'm at a loss to find anything wrong with them. I don't want to say this, of course, so I hunt hard for something to pick on. You can't really tell whether a set of instructions is all right until you check it against the device or procedure it describes, but I see a page separation that prevents reading without flipping back and forth between the text and illustration...always a poor practice. I jump on this very hard and DeWeese encourages every jump. My 11-year old son Chris takes the instructions to see what I mean.

But while I'm jumping on this and describing some of the agonies of misinterpretation that bad cross-referencing can produce, I've a feeling that this isn't why DeWeese found them so hard to understand. It's just the lack of smoothness and continuity which threw him off. He's unable to comprehend things when they appear in the ugly, chopped-up, grotesque sentence style common to engineering and technical writing. Science works with chunks and bits and pieces of things with the continuity presumed, and DeWeese works only with the continuities of things with the chunks and bits and pieces presumed. What he really wants me to damn is the lack of artistic continuity, something an engineer couldn't care less about. It hangs up, really, on the classic-romantic split, like everything else about technology.

But Chris, meanwhile, takes the instructions and folds them around in a way I hadn't thought of so that the illustration sits there right next to the text. I double-take this, then triple-take it and feel like a movie cartoon character who has just walked beyond the edge of a cliff but hasn't fallen yet because he hasn't realized his predicament. I nod, and there's silence, and then I realize my predicament, then a long laughter as I pound Chris on the top of the head all the way down to the bottom of the canyon. When the laughter subsides, I say, "Well, anyway —" but the laughter starts all over again.

"What I wanted to say," I finally get in, "is that I've a set of instructions at home which open up great realms for the improvement of technical writing. They begin, 'Assembly of Japanese bicycle require great peace of mind.' "

This produces more laughter, but several people give me sharp looks of recognition.

"That's a good instruction," one says while others nod.

"That's kind of why I saved it," I say. "At first I laughed because of memories of bicycles I'd put together and, of course, the unintended slur on Japanese manufacture. But there's a lot of wisdom in that statement."

John, who is also present, looks at me apprehensively. I look at him with equal apprehension. We both laugh. He says, "The professor will now expound."

"Peace of mind isn't at all superficial, really," I expound. "It's the whole thing. That which produces it is good maintenance; that which disturbs it is poor maintenance. What we call workability of the machine is just an objectification of this peace of mind. The ultimate test's always your own serenity. If you don't have this when you start and maintain it while you're working you're likely to build your personal problems right into the machine itself."

They just look at me, thinking about this.

"It's an unconventional concept," I say, "but conventional reason bears it out. The material object of observation, the bicycle or rotisserie, can't be right or wrong. Molecules are molecules. They don't have any ethical codes to follow except those people give them. The test of the machine is the satisfaction it gives you. There isn't any other test. If the machine produces tranquillity it's right. If it disturbs you it's wrong until either the machine or your mind is changed. The test of the machine's always your own mind. There isn't any other test."

DeWeese asks, "What if the machine is wrong and I feel peaceful about it?"

Laughter.

I reply, "That's self-contradictory. If you really don't care you aren't going to know it's wrong. The thought'll never occur to you. The act of pronouncing it wrong's a form of caring."

I add, "What's more common is that you feel unpeaceful even if it's right, and I think that's the actual case here. In this case, if you're worried, it isn't right. That means it isn't checked out thoroughly enough. In any industrial situation a machine that isn't checked out is a 'down' machine and can't be used even though it may work perfectly. Your worry about the rotisserie is the same thing. You haven't completed the ultimate requirement of achieving peace of mind, because you feel these instructions were too complicated and you may not have understood them correctly."

DeWeese asks, "Well, how would you change them so I would get this peace of mind?"

"That would require a lot more study than I've just given them now. The whole thing goes very deep. These rotisserie instructions begin and end exclusively with the machine. But the kind of approach I'm thinking about doesn't cut it off so narrowly. What's really angering about instructions of this sort is that they imply there's only one way to put this rotisserie together...their way. And that presumption wipes out all the creativity. Actually there are hundreds of ways to put the rotisserie together and when they make you follow just one way

without showing you the overall problem the instructions become hard to follow in such a way as not to make mistakes. You lose feeling for the work. And not only that, it’s very unlikely that they’ve told you the best way."

"But they’re from the factory," John says.

"I’m from the factory too," I say "and I know how instructions like this are put together. You go out on the assembly line with a tape recorder and the foreman sends you to talk to the guy he needs least, the biggest goof-off he’s got, and whatever he tells you...that’s the instructions. The next guy might have told you something completely different and probably better, but he’s too busy." They all look surprised. "I might have known," DeWeese says.

"It’s the format," I say. "No writer can buck it. Technology presumes there’s just one right way to do things and there never is. And when you presume there’s just one right way to do things, of course the instructions begin and end exclusively with the rotisserie. But if you have to choose among an infinite number of ways to put it together then the relation of the machine to you, and the relation of the machine and you to the rest of the world, has to be considered, because the selection from many choices, the art of the work is just as dependent upon your own mind and spirit as it is upon the material of the machine. That’s why you need the peace of mind."

"Actually this idea isn’t so strange," I continue. "Sometime look at a novice workman or a bad workman and compare his expression with that of a craftsman whose work you know is excellent and you’ll see the difference. The craftsman isn’t ever following a single line of instruction. He’s making decisions as he goes along. For that reason he’ll be absorbed and attentive to what he’s doing even though he doesn’t deliberately contrive this. His motions and the machine are in a kind of harmony. He isn’t following any set of written instructions because the nature of the material at hand determines his thoughts and motions, which simultaneously change the nature of the material at hand. The material and his thoughts are changing together in a progression of changes until his mind’s at rest at the same time the material’s right."

"Sounds like art," the instructor says.

"Well, it is art," I say. "This divorce of art from technology is completely unnatural. It’s just that it’s gone on so long you have to be an archeologist to find out where the two separated. Rotisserie assembly is actually a long-lost branch of sculpture, so divorced from its roots by centuries of intellectual wrong turns that just to associate the two sounds ludicrous."

They’re not sure whether I’m kidding or not.

"You mean," DeWeese asks, "that when I was putting this rotisserie together I was actually sculpting it?"

"Sure."

He goes over this in his mind, smiling more and more. "I wish I’d known that," he says. Laughter follows.

Chris says he doesn’t understand what I’m saying. "That’s all right, Chris," John says. "We don’t either." More laughter.

The difficulties which DeWeese and the Sutherlands have with the technology do not come from failing to sculpt the rotisserie or from being unable to hold the a priori of the bicycle you seek to assemble. It is not just a matter of art and technology. I see it as a kind of a noncoalescence between reason and feeling.

What's wrong with technology is that it's not connected in any real way with matters of the spirit and of the heart. And so it does blind, ugly things quite by accident and gets hated for that. People haven't paid much attention to this before because the big concern has been with food, clothing and shelter for everyone and technology has provided these.

But now where these are assured, the ugliness is being noticed more and more and people are asking if we must always suffer spiritually and esthetically in order to satisfy material needs.

This ugliness can't be solved by rational means because the rationality itself is the source of the problem. The only ones who're solving it are solving it at a personal level by abandoning 'square' rationality altogether and going by feelings alone. Like John and Sylvia. And millions of others like them. And that seems like a wrong direction too.

Rather, the solution to the problem isn't that you abandon rationality but that you expand the nature of rationality so that it's capable of coming up with a solution. I think present-day reason is an analogue of the flat earth of the medieval period. If you go too far beyond it you're presumed to fall off, into insanity. And people are very much afraid of that.

Rationality - analytic reason, dialectic reason - is sometimes considered to be the whole of understanding. You've never had to understand it really. It's always been completely bankrupt with regard to abstract art. Nonrepresentative art is one of the root experiences I'm talking about. Some people still condemn it because it doesn't make 'sense.' But what's really wrong is not the art but the 'sense,' the classical reason, which can't grasp it.

IX

Before I became a technical writer, I used to teach. I taught rhetoric at university level. Rhetoric is perhaps the most unprecise, unanalytic, amorphous subject taught at university. To a methodical mind trained in the scientific method, rhetoric is just completely hopeless. It's like a huge Sargasso Sea of stagnated logic.

What you're supposed to do in most freshman-rhetoric courses is to read a little essay or short story, discuss how the writer has done certain little things to achieve certain little effects, and then have the students write an imitative little essay or short story to see if they can do the same little things. I tried this over and over again but it never jelled. The students seldom achieved anything, as a result of this calculated mimicry, that was remotely close to the models I'd given them. More often their writing got worse. It seemed as though every rule I honestly tried to discover with them and learn with them was so full of exceptions and contradictions and qualifications and confusions that I ended up wishing I'd never come across the rule in the first place.

A student would always ask how the rule would apply in a certain special circumstance. I would then have the choice of trying to fake through a made-up explanation of how it worked, or follow the selfless route and say what I really thought. And what I really thought was that the rule was pasted on to the writing after the writing was all done. It was post hoc, after the fact, instead of prior to the fact.

And I became convinced that all the writers the students were supposed to mimic wrote without rules, putting down whatever sounded right, then going back to see if it still sounded

right and changing it if it didn’t. There were some who apparently wrote with calculating premeditation because that’s the way their product looked. But to me that seemed to be a very poor way to look. It had a certain syrup, as Gertrude Stein once said, but it didn’t pour.

But how’re you to teach something that isn’t premeditated? It was a seemingly impossible requirement. I just took the text and commented on it in an unpremeditated way and hoped the students would get something from that. It wasn’t satisfactory.

What was depressing was that the text was one of the most rational texts available on the subject of rhetoric and it still didn’t seem right. Moreover he had access to the authors, who were members of the department. He had asked and listened and talked and agreed with their answers in a rational way but somehow still wasn’t satisfied with them.

The text started with the premise that if rhetoric is to be taught at all at a University level it should be taught as a branch of reason, not as a mystic art. Therefore it emphasized a mastery of the rational foundations of communication in order to understand rhetoric. Elementary logic was introduced, elementary stimulus-response theory was brought in, and from these a progression was made to an understanding of how to develop an essay.

For the first year of teaching I was fairly content with this framework. I felt there was something wrong with it, but that the wrongness was not in this application of reason to rhetoric. The wrongness was in rationality itself. I just felt that no writer ever learned to write by this squarish, by-the-numbers, objective, methodical approach. Yet that was all rationality offered and there was nothing to do about it without being irrational. And if there was one thing I had a clear mandate to do in at university it was to be rational, so that's what I did, trudging along in that ugly prescriptive-rhetoric required by my department.

Then, one day, one of my colleagues said, "I hope you are teaching Quality to your students."

At first, this didn't quite register with me. What the hell was she talking about? Quality? Of course I taught Quality. Who wasn’t?

But the more I thought about Quality, I became less and less certain that I taught was, indeed, Quality.

Quality—you know what it is, yet you don’t know what it is. But that’s self-contradictory. But some things are better than others, that is, they have more quality. But when you try to say what the quality is, apart from the things that have it, it all goes poof! There’s nothing to talk about. But if you can’t say what Quality is, how do you know what it is, or how do you know that it even exists? If no one knows what it is, then for all practical purposes it doesn’t exist at all. But for all practical purposes it really does exist. What else are the grades based on? Why else would people pay fortunes for some things and throw others in the trash pile? Obviously some things are better than others—but what’s the "betterness"? -- So round and round you go, spinning mental wheels and nowhere finding anyplace to get traction. What the hell is Quality? What is it?

I spent a long time thinking about Quality, and how I could go about teaching it, since it seemed to be at the very centre of rhetoric. I began to find new ways to get students involved in the writing of rhetorics. I had been having trouble with students who had nothing to say. At first I thought it was laziness but later it became apparent that it wasn’t. They just couldn’t think of anything to say.

One of them, a girl with strong-lensed glasses, wanted to write a five-hundred-word essay about the United States. He was used to the sinking feeling that comes from statements like this, and suggested without disparagement that she narrow it down to just Bozeman, the university town in which I taught.

When the paper came due she didn’t have it and was quite upset. She had tried and tried but she just couldn’t think of anything to say.

I had already discussed her with her previous instructors and they’d confirmed his impressions of her. She was very serious, disciplined and hardworking, but extremely dull. Not a spark of creativity in her anywhere. Her eyes, behind the thick-lensed glasses, were the eyes of a drudge. She wasn’t bluffing, she really couldn’t think of anything to say, and was upset by her inability to do as she was told.

It just stumped me. Now I couldn’t think of anything to say. Then, a stroke of insight: "Narrow it down to the main street of Bozeman."

She nodded dutifully and went out. But just before her next class she came back in real distress, tears this time, distress that had obviously been there for a long time. She still couldn’t think of anything to say, and couldn’t understand why, if she couldn’t think of anything about all of Bozeman, she should be able to think of something about just one street.

I was furious and scolded her for not looking. So I limited her assignment even further: "Narrow it down to the front of one building on the main street of Bozeman. The Opera House. Start with the upper left-hand brick."

Her eyes, behind the thick-lensed glasses, opened wide. She came in the next class with a puzzled look and handed me a five-thousand-word essay on the front of the Opera House on the main street of Bozeman, Montana. "I sat in the hamburger stand across the street," she said, "and started writing about the first brick, and the second brick, and then by the third brick it all started to come and I couldn’t stop. They thought I was crazy, and they kept kidding me, but here it all is. I don’t understand it."

Neither did I, but on long walks through the streets of town I thought about it and concluded she was blocked because she was trying to repeat, in her writing, things she had already heard. She couldn’t think of anything to write about Bozeman because she couldn’t recall anything she had heard worth repeating. She was strangely unaware that she could look and see freshly for herself, as she wrote, without primary regard for what had been said before. The narrowing down to one brick destroyed the blockage because it was so obvious she had to do some original and direct seeing.

So I experimented further. In one class I had everyone write all hour about the back of my thumb. Everyone gave me funny looks at the beginning of the hour, but everyone did it, and there wasn’t a single complaint about "nothing to say."

In another class I changed the subject from the thumb to a coin, and got a full hour’s writing from every student. In other classes it was the same. Some asked, "Do you have to write about both sides?" Once they got into the idea of seeing directly for themselves they also saw there was no limit to the amount they could say. It was a confidence-building assignment too, because what they wrote, even though seemingly trivial, was nevertheless their own thing, not a mimicking of someone else’s.

As a result of these experiments I concluded that imitation was a real evil that had to be broken before real rhetoric teaching could begin. This imitation seemed to be an external compulsion. Little children didn’t have it. It seemed to come later on, possibly as a result of school itself.

That sounded right, and the more I thought about it the more right it sounded. Schools teach you to imitate. If you don't imitate what the teacher wants you get a bad grade. Here, in college, it was more sophisticated, of course; you were supposed to imitate the teacher in such a way as to convince the teacher you were not imitating, but taking the essence of the instruction and going ahead with it on your own. That got you A's. Originality on the other hand could get you anything...from A to F. The whole grading system cautioned against it.

X

I spent so much time thinking about the nature of Quality, that at one point, I forgot to prepare my notes for my next lecture, and as a cop-out, I wrote on the blackboard: "Write a 350-word essay answering the question, *What is quality in thought and statement?*"

At the end of the hour no one seemed to have finished, so I allowed the students to take their papers home. This class didn't meet again for two days, but when it did, the atmosphere was explosive. Almost everyone seemed as frustrated and angered as I was by the question.

"How are we supposed to know what quality is?" they said. "You're supposed to tell us!"

I told them that I couldn't figure it out either and really wanted to know, so I had assigned it in the hope that somebody would come up with a good answer. That ignited it. A roar of indignation shook the room. Before the commotion had settled down another teacher had stuck his head in the door to see what the trouble was.

"It's all right," I said. "We just accidentally stumbled over a genuine question, and the shock is hard to recover from." Some students looked curious at this, and the noise simmered down.

The truth was, he said, that he genuinely did want to know what they thought, not so that he could put a grade on it, but because he really wanted to know.

They looked puzzled.

"I sat there all night long," one said.

"I was ready to cry, I was so mad," a girl next to the window said.

"You should warn us," a third said.

"How could I warn you," he said, "when I had no idea how you'd react?"

Some of the puzzled ones looked at me with a first dawning: He wasn't playing games. He really wanted to know.

Then someone said, "What do you think?"

I answered, "I don't know."

"But what do you think?"

"I think there is such a thing as Quality, but that as soon as you try to define it, something goes haywire. You can’t do it."

Murmurs of agreement.

"Why this is, I don’t know. I thought maybe I’d get some ideas from your paper. I just don’t know."

This time the class was silent.

In subsequent classes that day there was some of the same commotion, but a number of students in each class volunteered friendly answers that told me the first class had been discussed during lunch.

A few days later I worked up a definition of his own and put it on the blackboard to be copied for posterity. The definition was: "Quality is a characteristic of thought and statement that is recognized by a nonthinking process. Because definitions are a product of rigid, formal thinking, quality cannot be defined."

The fact that this "definition" was actually a refusal to define did not draw comment. The students had no formal training that would have told them his statement was, in a formal sense, completely irrational. If you can’t define something you have no formal rational way of knowing that it exists. Neither can you really tell anyone else what it is. There is, in fact, no formal difference between inability to define and stupidity. When I say, "Quality cannot be defined," I’m really saying formally, "I’m stupid about Quality."

Fortunately the students didn’t know this. If they’d come up with these objections I wouldn’t have been able to answer them at the time.

But then, below the definition on the blackboard, I wrote, "But even though Quality cannot be defined, you know what Quality is!" and the storm started all over again.

"Oh, no, we don’t!"

"Oh, yes, you do."

"Oh, no,we don’t!"

"Oh, yes, you do!” I prepared some material to demonstrate it to them.

I'd selected two examples of student composition. The first was a rambling, disconnected thing with interesting ideas that never built into anything. The second was a magnificent piece by a student who was mystified himself about why it had come out so well. I read both, then asked for a show of hands on who thought the first was best. Two hands went up. Then I asked how many liked the second better. Twenty-eight hands went up.

"Whatever it is that caused the overwhelming majority to raise their hands for the second one is what I mean by Quality. So you know what it is."

There was a long reflective silence after this.

This was of course just intellectually outrageous. It wasn't teaching anymore, it was indoctrinating. I had erected an imaginary entity, defined it as incapable of definition, told the students over their own protests that they knew what it was, and demonstrated this by a technique that was as confusing logically as the term itself. i had been able to get away with this because logical refutation required more talent than any of the students had. In subsequent days I continually invited their refutations, but none came. So I improvised further.

To reinforce the idea that they already knew what Quality was I developed a routine in which I read four student papers in class and had everyone rank them in estimated order of Quality on a slip of paper. I did the same. Then I would collect the slips, tally them on the blackboard and average the rankings for an overall class opinion. Then I would reveal my own rankings, and this would almost always be close to, if not identical with the class average. Where there were differences it was usually because two papers were close in quality.

At first the classes were excited by this exercise, but as time went on they became bored. What Quality was appeared obvious. They obviously knew what it was too, and so they lost interest in listening. Their question now was "All right, we know what Quality is. How do we get it?"

Now, at last, the standard rhetoric texts came into their own. The principles expounded in them were no longer rules to rebel against, not ultimates in themselves, but just techniques, gimmicks, for producing what really counted and stood independently of the techniques...Quality. What had started out as a heresy from traditional rhetoric turned into a beautiful introduction to it.

Now, in answer to that eternal student question, How do I do this? I could reply, "It doesn't make a bit of difference how you do it! Just so it's good." The reluctant student might ask in class, "But how do we know what's good?" but almost before the question was out of his mouth he would realize the answer had already been supplied. Some other student would usually tell him, "You just see it." If he said, "No, I don't," he'd be told, "Yes, you do. He proved it." The student was finally and completely trapped into making quality judgments for himself. And it was just exactly this and nothing else that taught him to write.

Students, astonished, came by my office and said, "I used to just hate English. Now I spend more time on it than anything else." Not just one or two. Many. The whole Quality concept was beautiful. It worked. It was that mysterious, individual, internal goal of each creative person, on the blackboard at last.

XI

I got this far with this concept of Quality because I deliberately refused to look outside the immediate classroom experience. Cromwell's statement, "No one ever travels so high as he who knows not where he is going," applied at this point. I didn't know where I was going. All I knew was that it worked.

In time, however, I began to wonder why it worked, especially when I already knew it was irrational. Why should an irrational method work when rational methods were all so rotten?

There’s an entire branch of philosophy concerned with the definition of Quality, known as esthetics. Its question, What is meant by beautiful?, goes back to antiquity. But all of these philosophers were caught up in defining and intellectually knifing the concept of Quality to death to fit in their various world views.

I realized that when Quality is kept undefined by definition, the entire field called esthetics is completely disenfranchised. By refusing to define Quality I had placed it entirely outside the analytic process. If you can’t define Quality, there’s no way you can subordinate it to any intellectual rule. The estheticians can have nothing more to say. Their whole field, definition of Quality, is gone. No more explanations of what art is. No more wonderful critical schools of experts to determine rationally where each composer had succeeded or failed. All of them, every last one of those know-it-alls, would finally have to shut up.

But of course, since I couldn't define it, I had to answer the question, *If you can’t define it, what makes you think it exists?*

My answer was an old one belonging to a philosophic school that called itself realism: A thing exists if a world without it can’t function normally. If we can show that a world without Quality functions abnormally, then we have shown that Quality exists, whether it’s defined or not.

Then, as thought experiment, I sought to subtract Quality from a description of the world as we know it.

The first casualty from such a subtraction would be the fine arts. If you can’t distinguish between good and bad in the arts they disappear. There’s no point in hanging a painting on the wall when the bare wall looks just as good. There’s no point to symphonies, when scratches from the record or hum from the record player sound just as good.

Poetry would disappear, since it seldom makes sense and has no practical value. And interestingly, comedy would vanish too. No one would understand the jokes, since the difference between humor and no humor is pure Quality.

There would be no sports. Football, baseball, games of every sort would vanish. The scores would no longer be a measurement of anything meaningful, but simply empty statistics, like the number of stones in a pile of gravel. Who would attend them? Who would play?

Without Quality in the marketplace, the quality of flavor would be meaningless, supermarkets would carry only basic grains such as rice, cornmeal, soybeans and flour; possibly also some ungraded meat, milk for weaning infants and vitamin and mineral supplements to make up deficiencies. Alcoholic beverages, tea, coffee and tobacco would vanish. So would movies, dances, plays and parties. We would all use public transportation. We would all wear G.I. shoes.

A huge proportion of us would be out of work, but this would probably be temporary until we relocated in essential non-Quality work. Applied science and technology would be drastically changed, but pure science, mathematics, philosophy and particularly logic would be unchanged.

Indeed, it seemed that the purely intellectual pursuits were the least affected by the subtraction of Quality. If Quality were dropped, only rationality would remain unchanged.

By subtracting Quality from a picture of the world as we know it, you find that the world can function without it, but life would be so dull as to be hardly worth living. In fact it wouldn’t be

worth living. The term worth is a Quality term. Life would just be living without any values or purpose at all.

Thus, since the world obviously doesn't function normally when Quality is subtracted, Quality exists, whether it's defined or not.

After conjuring up this vision of a Qualityless world, I noticed how its resemblance to a number of social situations: Ancient Sparta, Communist Russia, Communist China, the Brave New World of Aldous Huxley and the 1984 of George Orwell. I also recalled people from my own experience who would have endorsed this Qualityless world. The kind of people who had to have reasons and plans and solutions for everything. I spent much time searching for a suitable name to sum up just what characterized them, so as to get a handle on this Qualityless world.

It was intellectual primarily, but it wasn't just intelligence that was fundamental. It was a certain basic attitude about the way the world was, a presumptive vision that it ran according to laws...reason...and that man's improvement lay chiefly through the discovery of these laws of reason and application of them toward satisfaction of his own desires. It was this faith that held everything together. Then it came to me:

Squareness. When you subtract quality you get squareness. Absence of Quality is the essence of squareness.

A recollection of some Negro artist friends came to mind. They had always been complaining about just this Qualitylessness. Square. That was their word for it. Way back long ago before the mass media had picked it up and given it national white usage they had called all that intellectual stuff square and had wanted nothing to do with it.

We had some fantastic conversations and attitudes because I was such a prime example of the squareness they were talking about. The more I had tried to pin them down on what they were talking about the vaguer they had gotten. Now, having found this concept of Quality which seemed to say the same thing, I was talking as vaguely as they did.

Quality. That's what they'd been talking about all the time. "If you have to ask what is it all the time, you'll never get time to know." They'd say.

Soul. Quality. The same?

In this way, Quality is a cleavage term. What every intellectual analyst looks for. You take your analytic knife, put the point directly on the term Quality and just tap, not hard, gently, and the whole world splits, cleaves, right in two... hip and square, classic and romantic, technological and humanistic.

And this brings us back to John and Sylvia, and how they perceive technology from a kind of "groovy dimension" that was concerned with the immediate surface of things whereas I was concerned with the underlying form. I called John's style romantic, mine classic. His was, in the argot of the sixties, "hip," mine was "square."

By using Quality to separate hip and square, it becomes the point of common understanding between the classic and romantic worlds. Both worlds use the term. Both know what it is.

All the time we are aware of millions of things around us...these changing shapes, these burning hills, the sound of the engine, the feel of the throttle, each rock and weed and fence

post and piece of debris beside the road...aware of these things but not really conscious of them unless there is something unusual or unless they reflect something we are predisposed to see. We could not possibly be conscious of these things and remember all of them because our mind would be so full of useless details we would be unable to think. From all this awareness we must select, and what we select and call consciousness is never the same as the awareness because the process of selection mutates it. We take a handful of sand from the endless landscape of awareness around us and call that handful of sand the world.

We each sit with our handful of sand, the world of which we're conscious, taken from the endless landscape of awareness around us. A process of discrimination goes to work on this handful of sand and divides it into parts. This and that. Here and there. Black and white. Now and then. The discrimination is the division of the conscious universe into parts.

The handful of sand looks uniform at first, but the longer we look at it the more diverse we find it to be. Each grain of sand is different. No two are alike. Some are similar in one way, some are similar in another way, and we can form the sand into separate piles on the basis of this similarity and dissimilarity. Shades of color in different piles...sizes in different piles...grain shapes in different piles...subtypes of grain shapes in different piles...grades of opacity in different piles...and so on, and on, and on. You'd think the process of subdivision and classification would come to an end somewhere, but it doesn't. It just goes on and on.

Classical, square understanding is concerned with the piles of sand and the nature of the grains and the basis for sorting and interrelating them. Romantic understanding is directed toward the handful of sand before the sorting begins.

Both are valid ways of looking at the world although irreconcilable with each other. Where the romantic leaves the world alone and appreciates it for what it is, the classic tries to turn it into a set of intellectual building blocks for other purposes.

But through my blocking of the definition, the classic mind is forced to view Quality as the romantic does, undistorted by thought structures. I want to take this further, to find a way of looking at the world that does violence to neither of these two kinds of understanding and unites them into one. Such an understanding will not reject sand-sorting or contemplation of unsorted sand for its own sake. Such an understanding will instead seek to direct attention to the endless landscape from which the sand is taken.

I think that the referent of a term that can split a world into hip and square, classic and romantic, technological and humanistic, is an entity that can unite a world already split along these lines into one. A real understanding of Quality doesn't just serve the System, or even beat it or even escape it. A real understanding of Quality captures the System, tames it, and puts it to work for one's own personal use, while leaving one completely free to fulfill his inner destiny.

At one point in my life, I went to India to study at the Benares Hindu University. There, I found that the doctrinal differences among Hinduism and Buddhism and Taoism are not anywhere near as important as doctrinal differences among Christianity and Islam and Judaism. Holy wars are not fought over them because verbalized statements about reality are never presumed to be reality itself.

Seeking a real understanding of Quality made me turn back to the oriental philosophy I had studied in India. On a whim, I picked up the 2,400-year-old *Tao Te Ching* of Lao Tzu, reading and substituting terms while interpreting the new meaning:

> *The quality that can be defined is not the Absolute Quality.*
>
> *The names that can be given it are not Absolute names.*
>
> *It is the origin of heaven and earth.*
>
> *When named it is the mother of all things*
>
> *Quality* [romantic Quality] *and its manifestations* [classic Quality] are *in their nature the same. It is given different names* [subjects and objects*] when it becomes classically manifest.*
>
> *Romantic quality and classic quality together may be called the "mystic."*
>
> *Reaching from mystery into deeper mystery ,it is the gate to the secret of all life.*
>
> *Quality is all-pervading.*
>
> *And its use is inexhaustible!*
>
> *Fathomless!*
>
> *Like the fountainhead of all things—*
>
> *Yet crystal clear like water it seems to remain.*
>
> *I do not know whose Son it is.*
>
> *An image of what existed before God.*
>
> *Continuously,continuously it seems to remain. Draw upon it and it serves you with ease—*
>
> *Looked at but cannot be seen—listened to but cannot be heard—grasped at but cannot be touched—these three elude all our inquiries and hence blend and become one.*
>
> *Not by its rising is there light ,*
>
> *Not by its sinking is there darkness*
>
> *Unceasing, continuous*

It cannot be defined

And reverts again into the realm of nothingness

That is why it is called the form of the formless

The image of nothingness

That is why it is called elusive

Meet it and you do not see its face

Follow it and you do not see its back

He who holds fast to the quality of old

Is able to know the primeval beginnings

Which are the continuity of quality.

As I read on through line after line, verse after verse of this, I watched them match, fit, slip into place. Exactly. This was it. This was what I'd been saying all along, only poorly, mechanistically. There was nothing vague or inexact about this book. It was as precise and definite as it could be.

In avoiding to define Quality, which enabled me to bridge the gap between the classic and romantic worlds, I had turned towards philosophical mysticism of the Oriental religions, the idea that truth is indefinable and can be apprehended only by nonrational means, which has been with us since the beginning of history.

What I had been talking about all the time as Quality was here the Tao, the great central generating force of all religions, Oriental and Occidental, past and present, all knowledge, everything.

XIII

First of all I should say that I don't know whether this insight that Quality is the Tao is true. I don't know of any way of testing it for truth, since all I have done is simply compare my understanding of one mystic entity with another. I certainly think they were the same, but I may not have completely understood what Quality is. Or, more likely, I may not have understood the Tao. I am no sage. And there's plenty of advice for sages in that book that I would have done well to heed.

I did nothing for Quality or the Tao. What benefited was reason. I found a way by which reason may be expanded to include elements that have previously been unassimilable and thus have been considered irrational. I think it's the overwhelming presence of these irrational elements crying for assimilation that creates the present bad quality, the chaotic, disconnected spirit of the twentieth century. I want to go at these now in as orderly a manner as possible.

There is a perennial classical question that asks which part of the motorcycle, which grain of sand in which pile, is the Buddha. Obviously to ask that question is to look in the wrong direction, for the Buddha is everywhere. But just as obviously to ask that question is to look in the right direction, for the Buddha is everywhere. About the Buddha that exists independently of any analytic thought much has been said.

The relationship of Quality to the area of Art has been shown rather exhaustively through a pursuit of my understanding of Quality in the Art of rhetoric. I don't think much more in the way of analysis need be made there. Art is high-quality endeavor. That is all that really needs to be said. Or, if something more high-sounding is demanded: Art is the Godhead as revealed in the works of man.

But about the Buddha that exists within analytic thought, and gives that analytic thought its direction, virtually nothing has been said, and there are historic reasons for this. When the knife of analytical thought is applied to experience, something is always killed in the process. That is fairly well understood, at least in the arts. Mark Twain's experience comes to mind, in which, after he had mastered the analytic knowledge needed to pilot the Mississippi River, he discovered the river had lost its beauty. Something is always killed. But what is less noticed in the arts... something is always created too. And instead of just dwelling on what is killed it's important also to see what's created and to see the process as a kind of death-birth continuity that is neither good nor bad, but just is.

In all of the Oriental religions great value is placed on the Sanskrit doctrine of *Tat tvam asi*, "Thou art that," which asserts that everything you think you are and everything you think you perceive are undivided. To realize fully this lack of division is to become enlightened.

Logic presumes a separation of subject from object; therefore logic is not final wisdom. There are many disciplines to that seeks to remove the illusion of separation of subject from object. One of the most important is the Sanskrit *dhyana*, mispronounced in Chinese as "Chan" and again mispronounced in Japanese as "Zen."

Zen is a practical discipline. As opposed to Buddhist schools, in Zen, enlightenment can be achieved in this lifetime. Zen wants you to act now, to experience the moment right now, directly. The effect of such action is to give you the power to cope. Coping appropriately is a key concept.

Saying that one does Zen is ultimately the same as saying one breathes or works or eats. However, the fruit of Zen practice is an awareness, a heightened sense of feeling and sensitivity that one develops in doing what comes naturally.

There is the active way and the passive way to practice Zen.

The passive way is Zazen, sitting in a cross-legged position with your hands relaxed, your arms relaxed, your shoulders relaxed, breathing in a controlled, rhythmic manner that quiets your activity, allowing for contemplative concentration and relaxation.

The active way concerns forms of expression left up to the individual. Classical Japanese expressions of Zen include brush painting, gardening, flower arranging, Haiku poetry, and various martial arts.

All of these activities are concerned with the practitioner attained an intuitive experience of Quality. The nature and context of the experience are irrelevant. As long as there is no

intrusion by the intellect, as long as the experience is immediate. With no mediation by the intellect. It is understanding without words. Quality is the Buddha. Verbal instruction is futile.

A Zen exercise to realize the futility of language is called a koan. The Zen master Hakuin asks the question, ”What is the sound of one hand clapping” the koan, or ”riddle,” is offered to point out that at times there are no intellectual, rational answers.

Think of any activity that you perform that you are good at. It can be investment banking, cooking, tennis, public speaking, repairing a motorcycle, or anything. What is it that makes you good at it? Is it your training, or the tools you use? Or is it the experience you have accumulated doing it? It is all of these things, in varying degrees, but one missing element is the crucial one. Your attitude, your approach, the sense of intuitive confidence you bring to your activity are what people observe when they say you are ”good at it.” That is what Zen gives.

Once I was visiting DeWeese in his studio, a light switch didn’t work and DeWeese asked me if I knew what was wrong with it. He had a slightly embarrassed, slightly puzzled smile on his face, like the smile of an art patron talking to a painter. The patron is embarrassed to reveal how little he knows but is smiling with the expectation of learning more.

DeWeese had the illusion the trouble was in the wire near the bulb because immediately upon toggling the switch the light went out. If the trouble had been in the switch, he felt, there would have been a lapse of time before the trouble showed up in the bulb. I did not argue with this, but went across the street to the hardware store, bought a switch and in a few minutes had it installed. It worked immediately, of course, leaving DeWeese puzzled and frustrated. "How did you know the trouble was in the switch?" he asked.

"Because it worked intermittently when I jiggled the switch."

"Well...couldn’t it jiggle the wire?"

"No." My cocksure attitude angered DeWeese and he started to argue. "How do you know all that?" he said.

"It’s obvious."

"Well then, why didn’t I see it?"

"You have to have some familiarity."

"Then it’s not obvious, is it?"

DeWeese always argued from this strange perspective that made it impossible to answer him. But what really was at stake was the intuitive familiarity with which I had fixed the light switch.

Earlier, I talked about caring, and I think it’s important now to tie care to Quality by pointing out that care and Quality are internal and external aspects of the same thing. A person who sees Quality and feels it as he works is a person who cares. A person who cares about what he sees and does is a person who’s bound to have some characteristics of Quality. I cared more about the nature of the light switch than DeWeese did.

Thus, if the problem of technological hopelessness is caused by absence of care, both by technologists and antitechnologists; and if care and Quality are external and internal aspects of the same thing, then it follows logically that what really causes technological hopelessness is absence of the perception of Quality in technology by both technologists and antitechnologists.

To me, examining what "Quality" means was really a pursuit of the answer to the whole problem of technological hopelessness. Quality is the Buddha. Quality is scientific reality. Quality is the goal of Art. It remains to work these concepts into a practical, down-to-earth context, and for this there is nothing more practical or down-to-earth than what I have been talking about all along... the repair of an old motorcycle.

XIV

Earlier I talked about how formal scientific method could be applied to the repair of a motorcycle through the study of chains of cause and effect and the application of experimental method to determine these chains. The purpose then was to show what was meant by classic rationality.

Now I want to show that that classic pattern of rationality can be tremendously improved, expanded and made far more effective through the formal recognition of Quality in its operation. Before doing this, however, I should go over some of the negative aspects of traditional maintenance to show just where the problems are.

The first is stuckness, a mental stuckness that accompanies the physical stuckness of whatever it is you're working on. A screw sticks, for example, on a side cover assembly. You check the manual to see if there might be any special cause for this screw to come off so hard, but all it says is "Remove side cover plate" in that wonderful terse technical style that never tells you what you want to know. There's no earlier procedure left undone that might cause the cover screws to stick.

If you're experienced you'd probably apply a penetrating liquid and an impact driver at this point. But suppose you're inexperienced and you attach a self-locking plier wrench to the shank of your screwdriver and really twist it hard, a procedure you've had success with in the past, but which this time succeeds only in tearing the slot of the screw.

Your mind was already thinking ahead to what you would do when the cover plate was off, and so it takes a little time to realize that this irritating minor annoyance of a torn screw slot isn't just irritating and minor. You're stuck. Stopped. Terminated. It's absolutely stopped you from fixing the motorcycle.

This isn't a rare scene in science or technology. This is the commonest scene of all. Just plain stuck. In traditional maintenance this is the worst of all moments, so bad that you have avoided even thinking about it before you come to it.

The book's no good to you now. Neither is scientific reason. You don't need any scientific experiments to find out what's wrong. It's obvious what's wrong. What you need is an hypothesis for how you're going to get that slotless screw out of there and scientific method doesn't provide any of these hypotheses. It operates only after they're around.

This is the zero moment of consciousness. Stuck. No answer. Honked. Kaput. It's a miserable experience emotionally. You're losing time. You're incompetent. You don't know what you're doing. You should be ashamed of yourself. You should take the machine to a real mechanic who knows how to figure these things out.

It's normal at this point for the fear-anger syndrome to take over and make you want to hammer on that side plate with a chisel, to pound it off with a sledge if necessary. You think about it, and the more you think about it the more you're inclined to take the whole machine to a high bridge and drop it off. It's just outrageous that a tiny little slot of a screw can defeat you so totally.

What you're up against is the great unknown, the void of all Western thought. You need some ideas, some hypotheses. Traditional scientific method, unfortunately, has never quite gotten around to say exactly where to pick up more of these hypotheses. Traditional scientific method has always been at the very best, 20-20 hindsight. It's good for seeing where you've been. It's good for testing the truth of what you think you know, but it can't tell you where you ought to go, unless where you ought to go is a continuation of where you were going in the past. Creativity, originality, inventiveness, intuition, imagination..."unstuckness," in other words...are completely outside its domain.

We're still stuck on that screw and the only way it's going to get unstuck is by abandoning further examination of the screw according to traditional scientific method. That won't work. What we have to do is examine traditional scientific method in the light of that stuck screw.

We have been looking at that screw "objectively." According to the doctrine of "objectivity," which is integral with traditional scientific method, what we like or don't like about that screw has nothing to do with our correct thinking. We should not evaluate what we see. We should keep our mind a blank tablet which nature fills for us, and then reason disinterestedly from the facts we observe.

But when we stop and think about it disinterestedly, in terms of this stuck screw, we begin to see that this whole idea of disinterested observation is silly. Where are those facts? What are we going to observe disinterestedly? The torn slot? The immovable side cover plate? The color of the paint job? The speedometer? The sissy bar? There are an infinite number of facts about the motorcycle, and the right ones don't just dance up and introduce themselves. The right facts, the ones we really need, are not only passive, they are damned elusive, and we're not going to just sit back and "observe" them. We're going to have to be in there looking for them or we're going to be here a long time. Forever. There must be a subliminal choice of what facts we observe.

The difference between a good mechanic and a bad one, like the difference between a good mathematician and a bad one, is precisely this ability to select the good facts from the bad ones on the basis of quality. He has to care! This is an ability about which formal traditional scientific method has nothing to say. It's long past time to take a closer look at this qualitative preselection of facts which has seemed so scrupulously ignored by those who make so much of these facts after they are "observed." I think that it will be found that a formal acknowledgment of the role of Quality in the scientific process doesn't destroy the empirical vision at all. It expands it, strengthens it and brings it far closer to actual scientific practice.

I think the basic fault that underlies the problem of stuckness is traditional rationality's insistence upon "objectivity," a doctrine that there is a divided reality of subject and object. For true science to take place these must be rigidly separate from each other. "You are the mechanic. There is the motorcycle. You are forever apart from one another. You do this to it. You do that to it. These will be the results."

This eternally dualistic subject-object way of approaching the motorcycle sounds right to us because we're used to it. But it's not right. It's always been an artificial interpretation superimposed on reality. It's never been reality itself. When this duality is completely accepted a certain nondivided relationship between the mechanic and motorcycle, a craftsmanlike feeling for the work, is destroyed. When traditional rationality divides the world into subjects and objects it shuts out Quality, and when you're really stuck it's Quality, not any subjects or objects, that tells you where you ought to go.

By returning our attention to Quality it is hoped that we can get technological work out of the noncaring subject-object dualism and back into craftsmanlike self-involved reality again, which will reveal to us the facts we need when we are stuck.

In my mind now is an image of a huge, long railroad train, one of those 120-boxcar jobs that cross the prairies all the time with lumber and vegetables going east and with automobiles and other manufactured goods going west. I want to call this railroad train "knowledge" and subdivide in into two parts: Classic Knowledge and Romantic Knowledge.

In terms of the analogy, Classic Knowledge, the knowledge taught at university, is the engine and all the boxcars. All of them and everything that's in them. If you subdivide the train into parts you will find no Romantic Knowledge anywhere. And unless you're careful it's easy to make the presumption that's all the train there is. This isn't because Romantic Knowledge is nonexistent or even unimportant. It's just that so far the definition of the train is static and purposeless. This was what I was trying to get at when I talked about two whole dimensions of existence. It's two whole ways of looking at the train.

Romantic Quality, in terms of this analogy, isn't any "part" of the train. It's the leading edge of the engine, a two-dimensional surface of no real significance unless you understand that the train isn't a static entity at all. A train really isn't a train if it can't go anywhere. In the process of examining the train and subdividing it into parts we've inadvertently stopped it, so that it really isn't a train we are examining. That's why we get stuck.

The real train of knowledge isn't a static entity that can be stopped and subdivided. It's always going somewhere. On a track called Quality. And that engine and all those 120 boxcars are never going anywhere except where the track of Quality takes them; and romantic Quality, the leading edge of the engine, takes them along that track.

Romantic reality is the cutting edge of experience. It's the leading edge of the train of knowledge that keeps the whole train on the track. Traditional knowledge is only the collective memory of where that leading edge has been. At the leading edge there are no subjects, no objects, only the track of Quality ahead, and if you have no formal way of evaluating, no way of acknowledging this Quality, then the entire train has no way of knowing where to go. You don't have pure reason...you have pure confusion. The leading edge is where absolutely all the action is. The leading edge contains all the infinite possibilities of the future. It contains all the history of the past. Where else could they be contained?

The past cannot remember the past. The future can't generate the future. The cutting edge of this instant right here and now is always nothing less than the totality of everything there is.

Value, the leading edge of reality, is no longer an irrelevant offshoot of structure. Value is the predecessor of structure. It's the preintellectual awareness that gives rise to it. Our structured reality is preselected on the basis of value, and really to understand structured reality requires an understanding of the value source from which it's derived.

One’s rational understanding of a motorcycle is therefore modified from minute to minute as one works on it and sees that a new and different rational understanding has more Quality. One doesn’t cling to old sticky ideas because one has an immediate rational basis for rejecting them. Reality isn’t static anymore. It’s not a set of ideas you have to either fight or resign yourself to. It’s made up, in part, of ideas that are expected to grow as you grow, and as we all grow, century after century. With Quality as a central undefined term, reality is, in its essential nature, not static but dynamic. And when you really understand dynamic reality you never get stuck. It has forms but the forms are capable of change.

To put it in more concrete terms: If you want to build a factory, or fix a motorcycle, or set a nation right without getting stuck, then classical, structured, dualistic subject-object knowledge, although necessary, isn’t enough. You have to have some feeling for the quality of the work. You have to have a sense of what’s good. That is what carries you forward. This sense isn’t just something you’re born with, although you are born with it. It’s also something you can develop. It’s not just "intuition," not just unexplainable "skill" or "talent." It’s the direct result of contact with basic reality, Quality, which dualistic reason has in the past tended to conceal.

It all sounds so far out and esoteric when it’s put like that it comes as a shock to discover that it is one of the most homespun, down-to-earth views of reality you can have. Harry Truman, of all people, comes to mind, when he said, concerning his administration’s programs, "We’ll just try them—and if they don’t work—why then we’ll just try something else." That may not be an exact quote, but it’s close.

The reality of the American government isn’t static, he said, it’s dynamic. If we don’t like it we’ll get something better. The American government isn’t going to get stuck on any set of fancy doctrinaire ideas.

The key word is "better"...Quality. Some may argue that the underlying form of the American government is stuck, is incapable of change in response to Quality, but that argument is not to the point. The point is that the President and everyone else, from the wildest radical to the wildest reactionary, agree that the government should change in response to Quality, even if it doesn’t. Phædrus’ concept of changing Quality as reality, a reality so omnipotent that whole governments must change to keep up with it, is something that in a wordless way we have always unanimously believed in all along.

And what Harry Truman said, really, was nothing different from the practical, pragmatic attitude of any laboratory scientist or any engineer or any mechanic when he’s not thinking "objectively" in the course of his daily work.

I keep talking wild theory, but it keeps somehow coming out stuff everybody knows, folklore. This Quality, this feeling for the work, is something known in every shop.

Now finally let’s get back to that screw.

Let’s consider a reevaluation of the situation in which we assume that the stuckness now occurring, the zero of consciousness, isn’t the worst of all possible situations, but the best possible situation you could be in. After all, it’s exactly this stuckness that Zen Buddhists go to so much trouble to induce so as to avoid the mediation of the intellect. Through koans, deep breathing, sitting still. Your mind is empty, you have a "hollow-flexible" attitude of "beginner’s mind." You’re right at the front end of the train of knowledge, at the track of reality itself. Consider, for a change, that this is a moment to be not feared but cultivated. If your mind is truly, profoundly stuck, then you may be much better off than when it was loaded with ideas.

The solution to the problem often at first seems unimportant or undesirable, but the state of stuckness allows it, in time, to assume its true importance. It seemed small because your previous rigid evaluation which led to the stuckness made it small.

But now consider the fact that no matter how hard you try to hang on to it, this stuckness is bound to disappear. Your mind will naturally and freely move toward a solution. Unless you are a real master at staying stuck you can't prevent this. The fear of stuckness is needless because the longer you stay stuck the more you see the Quality...reality that gets you unstuck every time. What's really been getting you stuck is the running from the stuckness through the cars of your train of knowledge looking for a solution that is out in front of the train.

Stuckness shouldn't be avoided. It's the psychic predecessor of all real understanding. An egoless acceptance of stuckness is a key to an understanding of all Quality, in mechanical work as in other endeavors. It's this understanding of Quality as revealed by stuckness which so often makes self-taught mechanics so superior to institute-trained men who have learned how to handle everything except a new situation.

Normally screws are so cheap and small and simple you think of them as unimportant. But now, as your Quality awareness becomes stronger, you realize that this one, individual, particular screw is neither cheap nor small nor unimportant. Right now this screw is worth exactly the selling price of the whole motorcycle, because the motorcycle is actually valueless until you get the screw out. With this reevaluation of the screw comes a willingness to expand your knowledge of it.

With the expansion of the knowledge, I would guess, would come a reevaluation of what the screw really is. If you concentrate on it, think about it, stay stuck on it for a long enough time, I would guess that in time you will come to see that the screw is less and less an object typical of a class and more an object unique in itself. Then with more concentration you will begin to see the screw as not even an object at all but as a collection of functions. Your stuckness is gradually eliminating patterns of traditional reason.

In the past when you separated subject and object from one another in a permanent way, your thinking about them got very rigid. You formed a class called "screw" that seemed to be inviolable and more real than the reality you are looking at. And you couldn't think of how to get unstuck because you couldn't think of anything new, because you couldn't see anything new.

Now, in getting that screw out, you aren't interested in what it is. What it is has ceased to be a category of thought and is a continuing direct experience. It's not in the boxcars anymore, it's out in front and capable of change. You are interested in what it does and why it's doing it. You will ask functional questions associated with a subliminal Quality discrimination, your caring guiding you.

What your actual solution is is unimportant as long as it has Quality. Thoughts about the screw as combined rigidness and adhesiveness and about its special helical interlock might lead naturally to solutions of impaction and use of solvents. That is one kind of Quality track. Another track may be to go to the library and look through a catalog of mechanic's tools, in which you might come across a screw extractor that would do the job. Or to call a friend who knows something about mechanical work. Or just to drill the screw out, or just burn it out with a torch. or you might just, as a result of your meditative attention to the screw, come up with some new way of extracting it that has never been thought of before and that beats all the rest and is patentable and makes you a millionaire five years from now. There's no predicting what's on that Quality track. The solutions all are simple...after you have arrived at them. But they're simple only when you know already what they are.

The ugliness the Sutherlands were fleeing is not inherent in technology. It only seemed that way to them because it's so hard to isolate what it is within technology that's so ugly. But technology is simply the making of things and the making of things can't by its own nature be ugly or there would be no possibility for beauty in the arts, which also include the making of things. Actually a root word of technology, techne, originally meant "art." The ancient Greeks never separated art from manufacture in their minds, and so never developed separate words for them.

Neither is the ugliness inherent in the materials of modern technology ... a statement you sometimes hear. Mass-produced plastics and synthetics aren't in themselves bad. They've just acquired bad associations. A person who's lived inside stone walls of a prison most of his life is likely to see stone as an inherently ugly material, even though it's also the prime material of sculpture, and a person who's lived in a prison of ugly plastic technology that started with his childhood toys and continues through a lifetime of junky consumer products is likely to see this material as inherently ugly. But the real ugliness of modern technology isn't found in any material or shape or act or product. These are just the objects in which the low Quality appears to reside. It's our habit of assigning Quality to subjects or objects that gives this impression.

The real ugliness is not the result of any objects of technology. Nor is it the result of any subjects of technology, the people who produce it or the people who use it. Quality, or its absence, doesn't reside in either the subject or the object. The real ugliness lies in the relationship between the people who produce the technology and the things they produce, which results in a similar relationship between the people who use the technology and the things they use.

At the moment of pure Quality perception, or not even perception, at the moment of pure Quality, there is no subject and there is no object. There is only a sense of Quality that produces a later awareness of subjects and objects. At the moment of pure quality, subject and object are identical. This is the *tat tvam asi* truth of the Upanishads, but it's also reflected in modern street argot. "Getting with it," "digging it," "grooving on it" are all slang reflections of this identity. It is this identity that is the basis of craftsmanship in all the technical arts. And it is this identity that modern, dualistically conceived technology lacks. The creator of it feels no particular sense of identity with it. The owner of it feels no particular sense of identity with it. The user of it feels no particular sense of identity with it. Hence, by my definition, it has no Quality.

A zen garden is an act of technology. It is beautiful, but not because of any masterful intellectual planning or any scientific supervision of the job, or any added expenditures to "stylize" it. It is beautiful because the people who worked on it have a way of looking at things that made them do it right unselfconsciously. They didn't separate themselves from the work in such a way as to do it wrong. There is the center of the whole solution.

The way to solve the conflict between human values and technological needs is not to run away from technology. That's impossible. The way to resolve the conflict is to break down the barriers of dualistic thought that prevent a real understanding of what technology is ... not an exploitation of nature, but a fusion of nature and the human spirit into a new kind of creation that transcends both. When this transcendence occurs in such events as the first airplane flight across the ocean or the first footstep on the moon, a kind of public recognition of the transcendent nature of technology occurs. But this transcendence should also occur at the individual level, on a personal basis, in one's own life, in a less dramatic way.

Such personal transcendence of conflicts with technology doesn't have to involve motorcycles, of course. It can be at a level as simple as sharpening a kitchen knife or sewing a dress or

mending a broken chair. The underlying problems are the same. In each case there's a beautiful way of doing it and an ugly way of doing it, and in arriving at the high-quality, beautiful way of doing it, both an ability to see what "looks good" and an ability to understand the underlying methods to arrive at that "good" are needed. Both classic and romantic understandings of Quality must be combined.

The nature of our culture is such that if you were to look for instruction in how to do any of these jobs, the instruction would always give only one understanding of Quality, the classic. It would tell you how to hold the blade when sharpening the knife, or how to use a sewing machine, or how to mix and apply glue with the presumption that once these underlying methods were applied, "good" would naturally follow. The ability to see directly what "looks good" would be ignored.

The result is rather typical of modern technology, an overall dullness of appearance so depressing that it must be overlaid with a veneer of "style" to make it acceptable. And that, to anyone who is sensitive to romantic Quality, just makes it all the worse. Now it's not just depressingly dull, it's also phony. Put the two together and you get a pretty accurate basic description of modern American technology: stylized cars and stylized outboard motors and stylized typewriters and stylized clothes. Stylized refrigerators filled with stylized food in stylized kitchens in stylized houses. Plastic stylized toys for stylized children, who at Christmas and birthdays are in style with their stylish parents. You have to be awfully stylish yourself not to get sick of it once in a while. It's the style that gets you; technological ugliness syruped over with romantic phoniness in an effort to produce beauty and profit by people who, though stylish, don't know where to start because no one has ever told them there's such a thing as Quality in this world and it's real, not style. Quality isn't something you lay on top of subjects and objects like tinsel on a Christmas tree. Real Quality must be the source of the subjects and objects, the cone from which the tree must start.

To arrive at this Quality requires a somewhat different procedure from the "Step 1, Step 2, Step 3" instructions that accompany dualistic technology, and that's what I'll now try to go into.

XV

Now that solution. Throughout this text so far this whole problem of technological ugliness has been looked at in a negative way. It's been said that romantic attitudes toward Quality such as the Sutherlands have are, by themselves, hopeless. You can't live on just groovy emotions alone. You have to work with the underlying form of the universe too, the laws of nature which, when understood, can make work easier, sickness rarer and famine almost absent. On the other hand, technology based on pure dualistic reason has also been condemned because it obtains these material advantages by turning the world into a stylized garbage dump. Now's the time to stop condemning things and come up with some answers.

The answer is that classic understanding should not be overlaid with romantic prettiness; classic and romantic understanding should be united at a basic level. In the past our common universe of reason has been in the process of escaping, rejecting the romantic, irrational world of prehistoric man. It's been necessary since before the time of Socrates to reject the passions, the emotions, in order to free the rational mind for an understanding of nature's order which was as yet unknown. Now it's time to further an understanding of nature's order

by reassimilating those passions which were originally fled from. The passions, the emotions, the affective domain of man's consciousness, are a part of nature's order too. The central part.

At present we're snowed under with an irrational expansion of blind data-gathering in the sciences because there's no rational format for any understanding of scientific creativity. At present we are also snowed under with a lot of stylishness in the arts ... thin art ... because there's very little assimilation or extension into underlying form. We have artists with no scientific knowledge and scientists with no artistic knowledge and both with no spiritual sense of gravity at all, and the result is not just bad, it is ghastly. The time for real reunification of art and technology is really long overdue.

Earlier I talked about peace of mind in connection with technical work but got laughed off the scene because I brought it up out of the context in which it had originally appeared to me. Now I think it is in context to return to peace of mind and see what I was talking about.

Peace of mind isn't at all superficial to technical work. It's the whole thing. That which produces it is good work and that which destroys it is bad work. The specs, the measuring instruments, the quality control, the final check-out, these are all means toward the end of satisfying the peace of mind of those responsible for the work. What really counts in the end is their peace of mind, nothing else. The reason for this is that peace of mind is a prerequisite for a perception of that Quality which is beyond romantic Quality and classic Quality and which unites the two, and which must accompany the work as it proceeds. The way to see what looks good and understand the reasons it looks good, and to be at one with this goodness as the work proceeds, is to cultivate an inner quietness, a peace of mind so that goodness can shine through.

I say inner peace of mind. It has no direct relationship to external circumstances. It can occur to a monk in meditation, to a soldier in heavy combat or to a machinist taking off that last ten-thousandth of an inch. It involves unselfconsciousness, which produces a complete identification with one's circumstances, and there are levels and levels of this identification and levels and levels of quietness quite as profound and difficult of attainment as the more familiar levels of activity. The mountains of achievement are Quality discovered in one direction only, and are relatively meaningless and often unobtainable unless taken together with the ocean trenches of self-awareness...so different from self-consciousness...which result from inner peace of mind.

This inner peace of mind occurs on three levels of understanding. Physical quietness seems the easiest to achieve, although there are levels and levels of this too, as attested by the ability of Hindu mystics to live buried alive for many days. Mental quietness, in which one has no wandering thoughts at all, seems more difficult, but can be achieved. But value quietness, in which one has no wandering desires at all but simply performs the acts of his life without desire, that seems the hardest.

I've sometimes thought this inner peace of mind, this quietness is similar to if not identical with the sort of calm you sometimes get when going fishing, which accounts for much of the popularity of this sport. Just to sit with the line in the water, not moving, not really thinking about anything, not really caring about anything either, seems to draw out the inner tensions and frustrations that have prevented you from solving problems you couldn't solve before and introduced ugliness and clumsiness into your actions and thoughts.

You don't have to go fishing, of course, to fix your motorcycle. A cup of coffee, a walk around the block, sometimes just putting off the job for five minutes of silence is enough. When you do you can almost feel yourself grow toward that inner peace of mind that reveals it all. That which turns its back on this inner calm and the Quality it reveals is bad maintenance. That

which turns toward it is good. The forms of turning away and toward are infinite but the goal is always the same.

I think that when this concept of peace of mind is introduced and made central to the act of technical work, a fusion of classic and romantic quality can take place at a basic level within a practical working context. I've said you can actually see this fusion in skilled mechanics and machinists of a certain sort, and you can see it in the work they do. To say that they are not artists is to misunderstand the nature of art. They have patience, care and attentiveness to what they're doing, but more than this...there's a kind of inner peace of mind that isn't contrived but results from a kind of harmony with the work in which there's no leader and no follower. The material and the craftsman's thoughts change together in a progression of smooth, even changes until his mind is at rest at the exact instant the material is right.

We've all had moments of that sort when we're doing something we really want to do. It's just that somehow we've gotten into an unfortunate separation of those moments from work. The mechanic I'm talking about doesn't make this separation. One says of him that he is "interested" in what he's doing, that he's "involved" in his work. What produces this involvement is, at the cutting edge of consciousness, an absence of any sense of separateness of subject and object. "Being with it," "being a natural," "taking hold"...there are a lot of idiomatic expressions for what I mean by this absence of subject-object duality, because what I mean is so well understood as folklore, common sense, the everyday understanding of the shop. But in scientific parlance the words for this absence of subject-object duality are scarce because scientific minds have shut themselves off from consciousness of this kind of understanding in the assumption of the formal dualistic scientific outlook.

Zen Buddhists talk about "just sitting," a meditative practice in which the idea of a duality of self and object does not dominate one's consciousness. What I'm talking about here in motorcyele maintenance is "just fixing," in which the idea of a duality of self and object doesn't dominate one's consciousness. When one isn't dominated by feelings of separateness from what he's working on, then one can be said to "care" about what he's doing. That is what caring really is, a feeling of identification with what one's doing. When one has this feeling then he also sees the inverse side of caring, Quality itself.

So the thing to do when working on a motorcycle, as in any other task, is to cultivate the peace of mind which does not separate one's self from one's surroundings. When that is done successfully then everything else follows naturally. Peace of mind produces right values, right values produce right thoughts. Right thoughts produce right actions and right actions produce work which will be a material reflection for others to see of the serenity at the center of it all. Just like a Zen garden is a material reflection of a spiritual reality.

I think that if we are going to reform the world, and make it a better place to live in, the way to do it is not with talk about relationships of a political nature, which are inevitably dualistic, full of subjects and objects and their relationship to one another; or with programs full of things for other people to do. I think that kind of approach starts it at the end and presumes the end is the beginning. Programs of a political nature are important end products of social quality that can be effective only if the underlying structure of social values is right. The social values are right only if the individual values are right. The place to improve the world is first in one's own heart and head and hands, and then work outward from there. other people can talk about how to expand the destiny of mankind. I just want to talk about how to fix a motorcycle. I think that what I have to say has more lasting value.

XVI

I like the word "gumption" because it's so homely and so forlorn and so out of style it looks as if it needs a friend and isn't likely to reject anyone who comes along. It's an old Scottish word, once used a lot by pioneers, but which, like "kin," seems to have all but dropped out of use. I like it also because it describes exactly what happens to someone who connects with Quality. He gets filled with gumption.

The Greeks called it enthousiasmos, the root of "enthusiasm." which means literally "filled with theos," or God, or Quality. See how that fits?

A person filled with gumption doesn't sit around dissipating and stewing about things. He's at the front of the train of his own awareness, watching to see what's up the track and meeting it when it comes. That's gumption.

The gumption-filling process occurs when one is quiet long enough to see and hear and feel the real universe, not just one's own stale opinions about it. But it's nothing exotic. That's why I like the word.

You see it often in people who return from long, quiet fishing trips. Often they're a little defensive about having put so much time to "no account" because there's no intellectual justification for what they've been doing. But the returned fisherman usually has a peculiar abundance of gumption, usually for the very same things he was sick to death of a few weeks before. He hasn't been wasting time. It's only our limited cultural viewpoint that makes it seem so.

If you're going to repair a motorcycle, an adequate supply of gumption is the first and most important tool. If you haven't got that you might as well gather up all the other tools and put them away, because they won't do you any good.

Gumption is the psychic gasoline that keeps the whole thing going. If you haven't got it there's no way the motorcycle can possibly be fixed. But if you have got it and know how to keep it there's absolutely no way in this whole world that motorcycle can keep from getting fixed. It's bound to happen. Therefore the thing that must be monitored at all times and preserved before anything else is the gumption.

This paramount importance of gumption solves a problem of format of this Chautauqua. The problem has been how to get off the generalities. If the Chautauqua gets into the actual details of fixing one individual machine the chances are overwhelming that it won't be your make and model and the information will be not only useless but dangerous, since information that fixes one model can sometimes wreck another. For detailed information of an objective sort, a separate shop manual for the specific make and model of machine must be used. In addition, a general shop manual such as Audel's Automotive Guide fills in the gaps.

But there's another kind of detail that no shop manual goes into but that is common to all machines and can be given here. This is the detail of the Quality relationship, the gumption relationship, between the machine and the mechanic, which is just as intricate as the machine itself. Throughout the process of fixing the machine things always come up, low-quality things, from a dusted knuckle to an accidentally ruined "irreplaceable" assembly. These drain off gumption, destroy enthusiasm and leave you so discouraged you want to forget the whole business. I call these things "gumption traps."

There are hundreds of different kinds of gumption traps, maybe thousands, maybe millions. I have no way of knowing how many I don't know. I know it seems as though I've stumbled into every kind of gumption trap imaginable. What keeps me from thinking I've hit them all is that with every job I discover more. Motorcycle maintenance gets frustrating. Angering. Infuriating. That's what makes it interesting.

What I have in mind now is a catalog of "Gumption Traps I Have Known." I want to start a whole new academic field, gumptionology, in which these traps are sorted, classified, structured into hierarchies and interrelated for the edification of future generations and the benefit of all mankind.

Gumptionology 101...An examination of affective, cognitive and psychomotor blocks in the perception of Quality relationships...3 cr,VII,MWF. I'd like to see that in a college catalog somewhere.

In traditional maintenance gumption is considered something you're born with or have acquired as a result of good upbringing. It's a fixed commodity. From the lack of information about how one acquires this gumption one might assume that a person without any gumption is a hopeless case.

In nondualistic maintenance gumption isn't a fixed commodity. It's variable, a reservoir of good spirits that can be added to or subtracted from. Since it's a result of the perception of Quality, a gumption trap, consequently, can be defined as anything that causes one to lose sight of Quality, and thus lose one's enthusiasm for what one is doing. As one might guess from a definition as broad as this, the field is enormous and only a beginning sketch can be attempted here.

As far as I can see there are two main types of gumption traps. The first type is those in which you're thrown off the Quality track by conditions that arise from external circumstances, and I call these "setbacks." The second type is traps in which you're thrown off the Quality track by conditions that are primarily within yourself. These I don't have any generic name for..."hang-ups" I suppose. I'll take up the externally caused setbacks first.

The first time you do any major job it seems as though the out-of-sequence-reassembly setback is your biggest worry. This occurs usually at a time when you think you're almost done. After days of work you finally have it all together except for: What's this? A connecting-rod bearing liner?! How could you have left that out? Oh Jesus, everything's got to come apart again! You can almost hear the gumption escaping. Psssssssssssss.

There's nothing you can do but go back and take it all apart again—after a rest period of up to a month that allows you to get used to the idea.

There are two techniques I use to prevent the out-of- sequence-reassembly setback. I use them mainly when I'm getting into a complex assembly I don't know anything about.

It should be inserted here parenthetically that there's a school of mechanical thought which says I shouldn't be getting into a complex assembly I don't know anything about. I should have training or leave the job to a specialist. That's a self-serving school of mechanical eliteness I'd like to see wiped out. That was a "specialist" who broke the fins on this machine. I've edited manuals written to train specialists for IBM, and what they know when they're done isn't that great. You're at a disadvantage the first time around and it may cost you a little more because of parts you accidentally damage, and it will almost undoubtedly take a lot more time, but the next time around you're way ahead of the specialist. You, with gumption, have learned

the assembly the hard way and you've a whole set of good feelings about it that he's unlikely to have.

Anyway, the first technique for preventing the out-of-sequence-reassembly gumption trap is a notebook in which I write down the order of disassembly and note anything unusual that might give trouble in reassembly later on. This notebook gets plenty grease-smeared and ugly. But a number of times one or two words in it that didn't seem important when written down have prevented damage and saved hours of work. The notes should pay special attention to left-hand and right-hand and up-and-down orientations of parts, and color coding and positions of wires. If incidental parts look worn or damaged or loose this is the time to note it so that you can make all your parts purchases at the same time.

The second technique for preventing the out-of- sequence-reassembly gumption trap is newspapers opened out on the floor of the garage on which all the parts are laid left-to-right and top-to-bottom in the order in which you read a page. That way when you put it back together in reverse order the little screws and washers and pins that can be easily overlooked are brought to your attention as you need them.

Even with all these precautions, however, out-of-sequence-reassemblies sometimes occur and when they do you've got to watch the gumption. Watch out for gumption desperation, in which you hurry up wildly in an effort to restore gumption by making up for lost time. That just creates more mistakes. When you first see that you have to go back and take it apart all over again it's definitely time for that long break.

It's important to distinguish from these the reassemblies that were out of sequence because you lacked certain information. Frequently the whole reassembly process becomes a cut-and-try technique in which you have to take it apart to make a change and then put it together again to see if the change works. If it doesn't work, that isn't a setback because the information gained is a real progress.

But if you've made just a plain old dumb mistake in reassembly, some gumption can still be salvaged by the knowledge that the second disassembly and reassembly is likely to go much faster than the first one. You've unconsciously memorized all sorts of things you won't have to relearn.

The intermittent failure setback is next. In this the thing that is wrong becomes right all of a sudden just as you start to fix it. Electrical short circuits are often in this class. The short occurs only when the machine's bouncing around. As soon as you stop everything's okay. It's almost impossible to fix it then. All you can do is try to get it to go wrong again and if it won't, forget it. Intermittents become gumption traps when they fool you into thinking you've really got the machine fixed. It's always a good idea on any job to wait a few hundred miles before coming to that conclusion. They're discouraging when they crop up again and again, but when they do you're no worse off than someone who goes to a commercial mechanic. In fact you're better off. They're much more of a gumption trap for the owner who has to drive his machine to the shop again and again and never get satisfaction. On your own machine you can study them over a long period of time, something a commercial mechanic can't do, and you can just carry around the tools you think you'll need until the intermittent happens again, and then, when it happens, stop and work on it.

When intermittents recur, try to correlate them with other things the cycle is doing. Do the misfires, for example, occur only on bumps, only on turns, only on acceleration? Only on hot days? These correlations are clues for cause-and-effect hypotheses. In some intermittents you have to resign yourself to a long fishing expedition, but no matter how tedious that gets it's never as tedious as taking the machine to a commercial mechanic five times. I'm tempted to

go into long detail about "Intermittents I Have Known" with a blow-by-blow description of how these were solved. But this gets like those fishing stories, of interest mainly to the fisherman, who doesn’t quite catch on to why everybody yawns. He enjoyed it.

Next to misassemblies and intermittents I think the most common external gumption trap is the parts setback. Here a person who does his own work can get depressed in a number of ways. Parts are something you never plan on buying when you originally get the machine. Dealers like to keep their inventories small. Wholesalers are slow and always understaffed in the spring when everybody buys motorcycle parts.

The pricing on parts is the second part of this gumption trap. It’s a well-known industrial policy to price the original equipment competitively, because the customer can always go somewhere else, but on parts to overprice and clean up. The price of the part is not only jacked up way beyond its new price; you get a special price because you’re not a commercial mechanic. This is a sly arrangement that allows the commercial mechanic to get rich by putting in parts that aren’t needed.

One more hurdle yet. The part may not fit. Parts lists always contain mistakes. Make and model changes are confusing. Out-of-tolerance parts runs sometimes get through quality control because there’s no operating checkout at the factory. Some of the parts you buy are made by specialty houses who don’t have access to the engineering data needed to make them right. Sometimes they get confused about make and model changes. Sometimes the parts man you’re dealing with jots down the wrong number. Sometimes you don’t give him the right identification. But it’s always a major gumption trap to get all the way home and discover that a new part won’t work.

The parts traps may be overcome by a combination of a number of techniques. First, if there’s more than one supplier in town by all means choose the one with the most cooperative parts man. Get to know him on a first-name basis. Often he will have been a mechanic once himself and can provide a lot of information you need.

Keep an eye out for price cutters and give them a try. Some of them have good deals. Auto stores and mail- order houses frequently stock the commoner cycle parts at prices way below those of the cycle dealers. You can buy roller chain from chain manufacturers, for example, at way below the inflated cycle-shop prices.

Always take the old part with you to prevent getting a wrong part. Take along some machinist’s calipers for comparing dimensions.

Finally, if you’re as exasperated as I am by the parts problem and have some money to invest, you can take up the really fascinating hobby of machining your own parts. I have a little 6-by-18-inch lathe with a milling attachment and a full complement of welding equipment: arc, heli-arc, gas and mini-gas for this kind of work. With the welding equipment you can build up worn surfaces with better than original metal and then machine it back to tolerance with carbide tools. You can’t really believe how versatile that lathe-plus-milling- plus-welding arrangement is until you’ve used it. If you can’t do the job directly you can always make something that will do it. The work of machining a part is very slow, and some parts, such as ball bearings, you’re never going to machine, but you’d be amazed at how you can modify parts designs so that you can make them with your equipment, and the work isn’t nearly as slow or frustrating as a wait for some smirking parts man to send away to the factory. And the work is gumption building, not gumption destroying. To run a cycle with parts in it you’ve made yourself gives you a special feeling you can’t possibly get from strictly store-bought parts.

Well, those were the commonest setbacks I can think of: out-of-sequence reassembly, intermittent failure and parts problems. But although setbacks are the commonest gumption traps they're only the external cause of gumption loss. Time now to consider some of the internal gumption traps that operate at the same time.

As the course description of gumptionology indicated, this internal part of the field can be broken down into three main types of internal gumption traps: those that block affective understanding, called "value traps"; those that block cognitive understanding, called "truth traps"; and those that block psychomotor behavior, called "muscle traps." The value traps are by far the largest and the most dangerous group.

Of the value traps, the most widespread and pernicious is value rigidity. This is an inability to revalue what one sees because of commitment to previous values. In motorcycle maintenance, you must rediscover what you do as you go. Rigid values make this impossible.

The typical situation is that the motorcycle doesn't work. The facts are there but you don't see them. You're looking right at them, but they don't yet have enough value. This is what Phædrus was talking about. Quality, value, creates the subjects and objects of the world. The facts do not exist until value has created them. If your values are rigid you can't really learn new facts.

This often shows up in premature diagnosis, when you're sure you know what the trouble is, and then when it isn't, you're stuck. Then you've got to find some new clues, but before you can find them you've got to clear your head of old opinions. If you're plagued with value rigidity you can fail to see the real answer even when it's staring you right in the face because you can't see the new answer's importance.

The birth of a new fact is always a wonderful thing to experience. It's dualistically called a "discovery" because of the presumption that it has an existence independent of anyone's awareness of it. When it comes along, it always has, at first, a low value. Then, depending on the value-looseness of the observer and the potential quality of the fact, its value increases, either slowly or rapidly, or the value wanes and the fact disappears.

The overwhelming majority of facts, the sights and sounds that are around us every second and the relationships among them and everything in our memory...these have no Quality, in fact have a negative quality. If they were all present at once our consciousness would be so jammed with meaningless data we couldn't think or act. So we preselect on the basis of Quality, and it makes this selection in such a way as to best harmonize what we are with what we are becoming.

What you have to do, if you get caught in this gumption trap of value rigidity, is slow down...you're going to have to slow down anyway whether you want to or not...but slow down deliberately and go over ground that you've been over before to see if the things you thought were important were really important and to—well—just stare at the machine. There's nothing wrong with that. Just live with it for a while. Watch it the way you watch a line when fishing and before long, as sure as you live, you'll get a little nibble, a little fact asking in a timid, humble way if you're interested in it. That's the way the world keeps on happening. Be interested in it.

At first try to understand this new fact not so much in terms of your big problem as for its own sake. That problem may not be as big as you think it is. And that fact may not be as small as you think it is. It may not be the fact you want but at least you should be very sure of that before you send the fact away. Often before you send it away you will discover it has friends

who are right next to it and are watching to see what your response is. Among the friends may be the exact fact you are looking for.

After a while you may find that the nibbles you get are more interesting than your original purpose of fixing the machine. When that happens you've reached a kind of point of arrival. Then you're no longer strictly a motorcycle mechanic, you're also a motorcycle scientist, and you've completely conquered the gumption trap of value rigidity.

I keep wanting to go back to that analogy of fishing for facts. I can just see somebody asking with great frustration, "Yes, but which facts do you fish for? There's got to be more to it than that."

But the answer is that if you know which facts you're fishing for you're no longer fishing. You've caught them. I'm trying to think of a specific example.—

All kinds of examples from cycle maintenance could be given, but the most striking example of value rigidity I can think of is the old South Indian Monkey Trap, which depends on value rigidity for its effectiveness. The trap consists of a hollowed-out coconut chained to a stake. The coconut has some rice inside which can be grabbed through a small hole. The hole is big enough so that the monkey's hand can go in, but too small for his fist with rice in it to come out. The monkey reaches in and is suddenly trapped...by nothing more than his own value rigidity. He can't revalue the rice. He cannot see that freedom without rice is more valuable than capture with it. The villagers are coming to get him and take him away. They're coming closer—closer! -- now! What general advice...not specific advice...but what general advice would you give the poor monkey in circumstances like this?

Well, I think you might say exactly what I've been saying about value rigidity, with perhaps a little extra urgency. There is a fact this monkey should know: if he opens his hand he's free. But how is he going to discover this fact? By removing the value rigidity that rates rice above freedom. How is he going to do that? Well, he should somehow try to slow down deliberately and go over ground that he has been over before and see if things he thought were important really were important and, well, stop yanking and just stare at the coconut for a while. Before long he should get a nibble from a little fact wondering if he is interested in it. He should try to understand this fact not so much in terms of his big problem as for its own sake. That problem may not be as big as he thinks it is. That fact may not be as small as he thinks it is either. That's about all the general information you can give him.

The next one is important. It's the internal gumption trap of ego. Ego isn't entirely separate from value rigidity but one of the many causes of it.

If you have a high evaluation of yourself then your ability to recognize new facts is weakened. Your ego isolates you from the Quality reality. When the facts show that you've just goofed, you're not as likely to admit it. When false information makes you look good, you're likely to believe it. On any mechanical repair job ego comes in for rough treatment. You're always being fooled, you're always making mistakes, and a mechanic who has a big ego to defend is at a terrific disadvantage. If you know enough mechanics to think of them as a group, and your observations coincide with mine, I think you'll agree that mechanics tend to be rather modest and quiet. There are exceptions, but generally if they're not quiet and modest at first, the work seems to make them that way. And skeptical. Attentive, but skeptical, But not egoistic. There's no way to bullshit your way into looking good on a mechanical repair job, except with someone who doesn't know what you're doing.

I was going to say that the machine doesn't respond to your personality, but it does respond to your personality. It's just that the personality that it responds to is your real personality, the

one that genuinely feels and reasons and acts, rather than any false, blown-up personality images your ego may conjure up. These false images are deflated so rapidly and completely you're bound to be very discouraged very soon if you've derived your gumption from ego rather than Quality.

If modesty doesn't come easily or naturally to you, one way out of this trap is to fake the attitude of modesty anyway. If you just deliberately assume you're not much good, then your gumption gets a boost when the facts prove this assumption is correct. This way you can keep going until the time comes when the facts prove this assumption is incorrect.

Anxiety, the next gumption trap, is sort of the opposite of ego. You're so sure you'll do everything wrong you're afraid to do anything at all. Often this, rather than "laziness," is the real reason you find it hard to get started. This gumption trap of anxiety, which results from overmotivation, can lead to all kinds of errors of excessive fussiness. You fix things that don't need fixing, and chase after imaginary ailments. You jump to wild conclusions and build all kinds of errors into the machine because of your own nervousness. These errors, when made, tend to confirm your original underestimation of yourself. This leads to more errors, which lead to more underestimation, in a self-stoking cycle.

The best way to break this cycle, I think, is to work out your anxieties on paper. Read every book and magazine you can on the subject. Your anxiety makes this easy and the more you read the more you calm down. You should remember that it's peace of mind you're after and not just a fixed machine.

When beginning a repair job you can list everything you're going to do on little slips of paper which you then organize into proper sequence. You discover that you organize and then reorganize the sequence again and again as more and more ideas come to you. The time spent this way usually more than pays for itself in time saved on the machine and prevents you from doing fidgety things that create problems later on.

You can reduce your anxiety somewhat by facing the fact that there isn't a mechanic alive who doesn't louse up a job once in a while. The main difference between you and the commercial mechanics is that when they do it you don't hear about it...just pay for it, in additional costs prorated through all your bills. When you make the mistakes yourself, you at]least get the benefit of some education.

Boredom is the next gumption trap that comes to mind. This is the opposite of anxiety and commonly goes with ego problems. Boredom means you're off the Quality track, you're not seeing things freshly, you've lost your "beginner's mind" and your motorcycle is in great danger. Boredom means your gumption supply is low and must be replenished before anything else is done.

When you're bored, stop! Go to a show. Turn on the TV. Call it a day. Do anything but work on that machine. If you don't stop, the next thing that happens is the Big Mistake, and then all the boredom plus the Big Mistake combine together in one Sunday punch to knock all the gumption out of you and you are really stopped.

My favorite cure for boredom is sleep. It's very easy to get to sleep when bored and very hard to get bored after a long rest. My next favorite is coffee. I usually keep a pot plugged in while working on the machine. If these don't work it may mean deeper Quality problems are bothering you and distracting you from what's before you. The boredom is a signal that you should turn your attention to these problems...that's what you're doing anyway...and control them before continuing on the motorcycle.

For me the most boring task is cleaning the machine. It seems like such a waste of time. It just gets dirty again the first time you ride it. John always kept his BMW spic and span. It really did look nice, while mine's always a little ratty, it seems. That's the classical mind at work, runs fine inside but looks dingy on the surface.

One solution to boredom on certain kinds of jobs such as greasing and oil changing and tuning is to turn them into a kind of ritual. There's an esthetic to doing things that are unfamiliar and another esthetic to doing things that are familiar. I have heard that there are two kinds of welders: production welders, who don't like tricky setups and enjoy doing the same thing over and over again; and maintenance welders, who hate it when they have to do the same job twice. The advice was that if you hire a welder make sure which kind he is, because they're not interchangeable. I'm in that latter class, and that's probably why I enjoy troubleshooting more than most and dislike cleaning more than most. But I can do both when I have to and so can anyone else. When cleaning I do it the way people go to church...not so much to discover anything new, although I'm alert for new things, but mainly to reacquaint myself with the familiar. It's nice sometimes to go over familiar paths.

Zen has something to say about boredom. Its main Zazen practice of "just sitting" has got to be the world's most boring activity...unless it's that Hindu practice of being buried alive. You don't do anything much; not move, not think, not care. What could be more boring? Yet in the center of all this boredom is the very thing Zen Buddhism seeks to teach. What is it? What is it at the very center of boredom that you're not seeing?

Impatience is close to boredom but always results from one cause: an underestimation of the amount of time the job will take. You never really know what will come up and very few jobs get done as quickly as planned. Impatience is the first reaction against a setback and can soon turn to anger if you're not careful.

Impatience is best handled by allowing an indefinite time for the job, particularly new jobs that require unfamiliar techniques; by doubling the allotted time when circumstances force time planning; and by scaling down the scope of what you want to do. Overall goals must be scaled down in importance and immediate goals must be scaled up. This requires value flexibility, and the value shift is usually accompanied by some loss of gumption, but it's a sacrifice that must be made. It's nothing like the loss of gumption that will occur if a Big Mistake caused by impatience occurs.

My favorite scaling-down exercise is cleaning up nuts and bolts and studs and tapped holes. I've got a phobia about crossed or jimmied or rust-jammed or dirt-jammed threads that cause nuts to turn slow or hard; and when I find one, I take its dimensions with a thread gauge and calipers, get out the taps and dies, recut the threads on it, then examine it and oil it and I have a whole new perspective on patience. Another one is cleaning up tools that have been used and not put away and are cluttering up the place. This is a good one because one of the first warning signs of impatience is frustration at not being able to lay your hand on the tool you need right away. If you just stop and put tools away neatly you will both find the tool and also scale down your impatience without wasting time or endangering the work.

Well, that about does it for value traps. There's a whole lot more of them, of course. I've really only just touched on the subject to show what's there. Almost any mechanic could fill you in for hours on value traps he's discovered that I don't know anything about. You're bound to discover plenty of them for yourself on almost every job. Perhaps the best single thing to learn is to recognize a value trap when you're in it and work on that before you continue on the machine.

XVII

Now I'll talk now about truth traps and muscle traps.

Truth traps are concerned with data that are apprehended and are within the boxcars of the train. For the most part these data are properly handled by conventional dualistic logic and the scientific method talked about earlier. But there's one trap that isn't...the truth trap of yes-no logic.

Yes and no—this or that—one or zero. On the basis of this elementary two-term discrimination, all human knowledge is built up. The demonstration of this is the computer memory which stores all its knowledge in the form of binary information. It contains ones and zeros, that's all.

Because we're unaccustomed to it, we don't usually see that there's a third possible logical term equal to yes and no which is capable of expanding our understanding in an unrecognized direction. We don't even have a term for it, so I'll have to use the Japanese mu.

Mu means "no thing." Like "Quality" it points outside the process of dualistic discrimination. Mu simply says, "No class; not one, not zero, not yes, not no." It states that the context of the question is such that a yes or no answer is in error and should not be given. "Unask the question" is what it says.

Mu becomes appropriate when the context of the question becomes too small for the truth of the answer. When the Zen monk Joshu was asked whether a dog had a Buddha nature he said "Mu," meaning that if he answered either way he was answering incorrectly. The Buddha nature cannot be captured by yes or no questions.

That mu exists in the natural world investigated by science is evident. It's just that, as usual, we're trained not to see it by our heritage. For example, it's stated over and over again that computer circuits exhibit only two states, a voltage for "one" and a voltage for "zero." That's silly!

Any computer-electronics technician knows otherwise. Try to find a voltage representing one or zero when the power is off! The circuits are in a mu state. They aren't at one, they aren't at zero, they're in an indeterminate state that has no meaning in terms of ones or zeros. Readings of the voltmeter will show, in many cases, "floating ground" characteristics, in which the technician isn't reading characteristics of the computer circuits at all but characteristics of the voltmeter itself. What's happened is that the power-off condition is part of a context larger than the context in which the one zero states are considered universal. The question of one or zero has been "unasked." And there are plenty of other computer conditions besides a power-off condition in which mu answers are found because of larger contexts than the one-zero universality.

The dualistic mind tends to think of mu occurrences in nature as a kind of contextual cheating, or irrelevance, but mu is found throughout all scientific investigation, and nature doesn't cheat, and nature's answers are never irrelevant. It's a great mistake, a kind of dishonesty, to sweep nature's mu answers under the carpet. Recognition and valuatian of these answers would do a lot to bring logical theory closer to experimental practice. Every laboratory scientist knows that very often his experimental results provide mu answers to the yes-no questions the

experiments were designed for. In these cases he considers the experiment poorly designed, chides himself for stupidity and at best considers the "wasted" experiment which has provided the mu answer to be a kind of wheel-spinning which might help prevent mistakes in the design of future yes-no experiments.

This low evaluation of the experiment which provided the mu answer isn't justified. The mu answer is an important one. It's told the scientist that the context of his question is too small for nature's answer and that he must enlarge the context of the question. That is a very important answer! His understanding of nature is tremendously improved by it, which was the purpose of the experiment in the first place. A very strong case can be made for the statement that science grows by its mu answers more than by its yes or no answer. Yes or no confirms or denies a hypothesis. Mu says the answer is beyond the hypothesis. Mu is the "phenomenon" that inspires scientific enquiry in the first place! There's nothing mysterious or esoteric about it. It's just that our culture has warped us to make a low value judgment of it.

In motorcycle maintenance the mu answer given by the machine to many of the diagnostic questions put to it is a major cause of gumption loss. It shouldn't be! When your answer to a test is indeterminate it means one of two things: that your test procedures aren't doing what you think they are or that your understanding of the context of the question needs to be enlarged. Check your tests and restudy the question. Don't throw away those mu answers! They're every bit as vital as the yes or no answers. They're more vital. They're the ones you grow on!

This motorcycle seems to be running a little hot—but I suppose it's just the hot dry country we're going through—I'll leave the answer to that in a mu state—until it gets worse or better.—

The mu expansion is the only thing I want to say about truth traps at this time. Time to switch to the psychomotor traps. This is the domain of understanding which is most directly related to what happens to the machine.

Here by far the most frustrating gumption trap is inadequate tools. Nothing's quite so demoralizing as a tool hang-up. Buy good tools as you can afford them and you'll never regret it. If you want to save money don't overlook the newspaper want ads. Good tools, as a rule, don't wear out, and good secondhand tools are much better than inferior new ones. Study the tool catalogs. You can learn a lot from them.

Apart from bad tools, bad surroundings are a major gumption trap. Pay attention to adequate lighting. It's amazing the number of mistakes a little light can prevent.

Some physical discomfort is unpreventable, but a lot of it, such as that which occurs in surroundings that are too hot or too cold, can throw your evaluations way off if you aren't careful. If you're too cold, for example, you'll hurry and probably make mistakes. If you're too hot your anger threshold gets much lower. Avoid out-of-position work when possible. A small stool on either side of the cycle will increase your patience greatly and you'll be much less likely to damage the assemblies you're working on.

There's one psychomotor gumption trap, muscular insensitivity, which accounts for some real damage. It results in part from lack of kinesthesia, a failure to realize that although the externals of a cycle are rugged, inside the engine are delicate precision parts which can be easily damaged by muscular insensitivity. There's what's called "mechanic's feel," which is very obvious to those who know what it is, but hard to describe to those who don't; and when you see someone working on a machine who doesn't have it, you tend to suffer with the machine.

The mechanic’s feel comes from a deep inner kinesthetic feeling for the elasticity of materials. Some materials, like ceramics, have very little, so that when you thread a porcelain fitting you’re very careful not to apply great pressures. Other materials, like steel, have tremendous elasticity, more than rubber, but in a range in which, unless you’re working with large mechanical forces, the elasticity isn’t apparent.

With nuts and bolts you’re in the range of large mechanical forces and you should understand that within these ranges metals are elastic. When you take up a nut there’s a point called "finger-tight" where there’s contact but no takeup of elasticity. Then there’s "snug," in which the easy surface elasticity is taken up. Then there’s a range called "tight," in which all the elasticity is taken up. The force required to reach these three points is different for each size of nut and bolt, and different for lubricated bolts and for locknuts. The forces are different for steel and cast iron and brass and aluminum and plastics and ceramics. But a person with mechanic’s feel knows when something’s tight and stops. A person without it goes right on past and strips the threads or breaks the assembly.

A "mechanic’s feel" implies not only an understanding for the elasticity of metal but for its softness. The insides of a motorcycle contain surfaces that are precise in some cases to as little as one ten-thousandth of an inch. If you drop them or get dirt on them or scratch them or bang them with a hammer they’ll lose that precision. It’s important to understand that the metal behind the surfaces can normally take great shock and stress but that the surfaces themselves cannot. When handling precision parts that are stuck or difficult to manipulate, a person with mechanic’s feel will avoid damaging the surfaces and work with his tools on the nonprecision surfaces of the same part whenever possible. If he must work on the surfaces themselves, he’ll always use softer surfaces to work them with. Brass hammers, plastic hammers, wood hammers, rubber hammers and lead hammers are all available for this work. Use them. Vise jaws can be fitted with plastic and copper and lead faces. Use these too. Handle precision parts gently. You’ll never be sorry. If you have a tendency to bang things around, take more time and try to develop a little more respect for the accomplishment that a precision part represents.

Now, some could ask, "Well, if I get around all those gumption traps, then will I have the thing licked?"

The answer, of course, is no, you still haven’t got anything licked. You’ve got to live right too. It’s the way you live that predisposes you to avoid the traps and see the right facts. You want to know how to paint a perfect painting? It’s easy. Make yourself perfect and then just paint naturally. That’s the way all the experts do it. The making of a painting or the fixing of a motorcycle isn’t separate from the rest of your existence. If you’re a sloppy thinker the six days of the week you aren’t working on your machine, what trap avoidances, what gimmicks, can make you all of a sudden sharp on the seventh? It all goes together.

But if you’re a sloppy thinker six days a week and you really try to be sharp on the seventh, then maybe the next six days aren’t going to be quite as sloppy as the preceding six. What I’m trying to come up with on these gumption traps I guess, is shortcuts to living right.

The real cycle you’re working on is a cycle called yourself. The machine that appears to be "out there" and the person that appears to be "in here" are not two separate things. They grow toward Quality or fall away from Quality together.

XVIII

Technology is blamed for a lot of loneliness, since the loneliness is certainly associated with the newer technological devices...TV, jets, freeways and so on...but I hope it's been made plain that the real evil isn't the objects of technology but the tendency of technology to isolate people into lonely attitudes of objectivity. That is the biggest gumption trap of all. The funeral procession mentality that people carry around with them every day. The one everybody's in, this hyped-up, fuck-you, supermodern, ego style of life.

It's the objectivity, the dualistic way of looking at things underlying technology, that produces the evil. That's why I went to so much trouble to show how technology could be used to destroy the evil. A person who knows how to fix motorcycles...with Quality...is less likely to run short of friends than one who doesn't. And they aren't going to see him as some kind of object either. Quality destroys objectivity every time.

Or if he takes whatever dull job he's stuck with...and they are all, sooner or later, dull...and, just to keep himself amused, starts to look for options of Quality, and secretly pursues these options, just for their own sake, thus making an art out of what he is doing, he's likely to discover that he becomes a much more interesting person and much less of an object to the people around him because his Quality decisions change him too. And not only the job and him, but others too because the Quality tends to fan out like waves. The Quality job he didn't think anyone was going to see is seen, and the person who sees it feels a little better because of it, and is likely to pass that feeling on to others, and in that way the Quality tends to keep on going.

My personal feeling is that this is how any further improvement of the world will be done: by individuals making Quality decisions and that's all. God, I don't want to have any more enthusiasm for big programs full of social planning for big masses of people that leave individual Quality out. These can be left alone for a while. There's a place for them but they've got to be built on a foundation of Quality within the individuals involved. We've had that individual Quality in the past, exploited it as a natural resource without knowing it, and now it's just about depleted. Everyone's just about out of gumption. And I think it's about time to return to the rebuilding of this resource...individual worth. There are political reactionaries who've been saying something close to this for years. I'm not one of them, but to the extent they're talking about real individual worth and not just an excuse for giving more money to the rich, they're right. We do need a return to individual integrity, self-reliance and old-fashioned gumption. We really do. I hope that I have pointed to some directions which leads towards that.