THE COLLEGE

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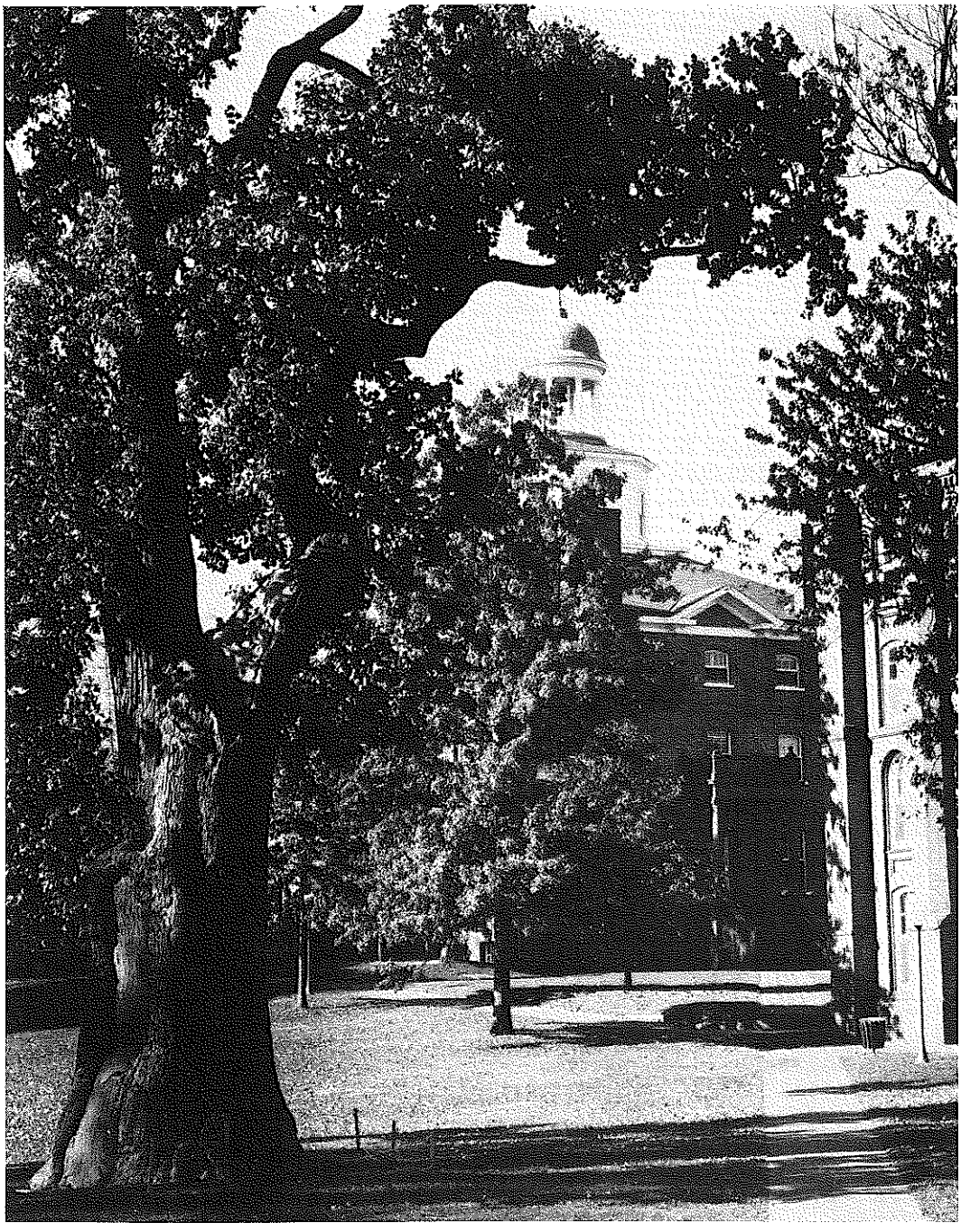

July, 1978

THE COLLEGE

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ON THE COVER:
The Liberty Tree, McDowell Hall, and the walkway from the Library somehow seem appropriate for this, the last of the "old" magazines. Photograph by Lawrence Ostrovsky of this year's senior class.

Old Editor's Note:

This issue of *The College* is devoid of a Campus and Alumni section and is thus a first step in the new direction indicated by my editorial Note in the January issue. Subsequent steps will be taken by the new editor, Leo Raditsa, who is away this year and will assume his duties in the new academic year. He will, I am sure, do bold and interesting things. I am happy to have such a seasoned and energetic successor, and wish him well in his new task.

B.R.v.O.

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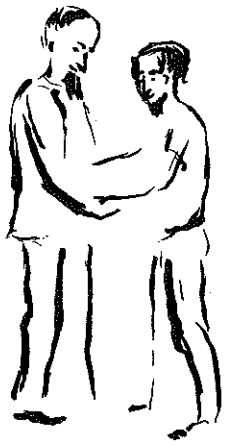
IN THE JULY ISSUE:

Credits:
Cover photo by Lawrence Ostrovsky '78; pages 1-8, sketches by Lydia H. Sparrow.



A Reading of the Parable of the Prodigal Son

by Edward G. Sparrow

If I ask you to listen to a lecture about the parable of the prodigal son, it is because I believe that there is none of us who has not at some time in his life had to meet the challenge of forgiveness, and who, having had to meet it, has not wondered to some extent about what it was that had challenged him. We might have had to meet it as a demand made on us by a parent that we forgive a playmate who had injured us. We might have met it as a request from someone that we forgive him. Or we might have sensed sometime that now was the moment for saying something to another person that would transform the tension between us into a bond of peace. But we cannot have lived long without being challenged to forgive.

I would like this evening to share some thoughts about forgiveness with you. And I hope that if some of you have not wondered about these things much before, well, perhaps you will wonder about them with me tonight. The thoughts I have in mind have to do with such questions as these: What is forgiveness? How does forgiveness differ from forgetting? Can we forgive somebody else if he does not ask for our forgiveness first? Can anybody forgive? Can we forgive ourselves? Can anybody be forgiven?

To be sure forgiveness is the first among those things that it is more important to practise than to know. But we surely cannot be the poorer for knowing what it is—or, at least, for trying to know what it is. There are some important things that we cannot truly understand unless we have given some thought to what forgiveness is.

I want us to consider forgiveness by looking together at the parable of the prodigal son. That parable is all about forgiveness; and because it is a parable, a story, it can give us an image of what we want to understand in terms that we can easily recognize and readily appropriate to our own experience. The word "forgiveness" itself does not appear in the story. But the prodigal, at an important moment in his life, when he is hungry and among the swine, resolves to go and say to his father, "Father, I have sinned against heaven, and before thee, and am no more worthy to be called thy son. Make me as one of thy hired servants." Later, however, he is found in his father's house feasting and dancing. We have to say in view of these two strikingly different moments in his relation to his father, that, whatever forgiveness might be, and although it is not mentioned by name in the parable, the father has forgiven his son by the time the son has gotten home. We can attach no meaning to the word forgiveness if we deny that the father has forgiven his son.

Let us read the parable now with these questions in mind. Where is the forgiveness in it? When does the father forgive his son? And how does he do it? After I have read it I will give you some of my thoughts on these questions.

> A certain man had two sons: and the younger of them said to his father, "Father, give me the portion of goods that fall unto me." And he divided unto them his living. And not many days after the younger son gathered all together, and took his journey into a far country, and there wasted his sub-

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Text of a lecture given by Mr. Sparrow, the Dean of St. John's College, Annapolis, at Santa Fe on 27 January 1978. Mr. Sparrow took his B.A. and studied law at Harvard (LL.B., 1954); after an M.A. at Teachers College, Columbia University (1957), he became a Tutor at St. John's College, Annapolis, in 1957. He served as Acting Director of the Integrated Liberal Arts Curriculum at St. Mary's College, California, from 1964 to 1966, was chairman of the St. John's Polity Review Committee, 1974-75, and became Dean in 1977.

stance with riotous living. And when he had spent all, there arose a mighty famine in that land; and he began to be in want. And he went and joined himself to a citizen of that country; and he sent him into his fields to feed swine. And he would fain have filled his belly with the husks that the swine did eat: and no man gave unto him. And when he came to himself, he said, "how many hired servants of my father's have bread enough and to spare, and I perish with hunger! I will arise and go to my father, and will say unto him, 'Father, I have sinned against heaven and before thee and am no more worthy to be called thy son: make me as one of thy hired servants.'" And he arose, and came to his father. But when he was yet a great way off, his father saw him, and had compassion, and ran, and fell on his neck, and kissed him. And the son said unto him, "Father, I have sinned against heaven, and in they sight, and am no more worthy to be called thy son." But the father said to his servants, "Bring forth the best robe, and put it on him; and put a ring on his hand, and shoes on his feet: and bring hither the fatted calf, and kill it; and let us eat, and be merry: for this my son was dead, and is alive again; he was lost, and is found." And they began to be merry.

Let me make some comments about this part of the story. "A certain man had two sons; and the younger of them said to his father, 'Father, give me the portion of goods that falleth to me.'" The younger son, perhaps because of what he thinks is an inferior status at home, perhaps as the result of an argument with his father or his elder brother, takes offense at his condition of dependence at home. More specifically he is offended that his father, by continuing to live, keeps him from having what he regards as his rightful share of the domestic wealth. And so he makes an extraordinary demand on his father. He makes a demand which, in effect, is that his father remove himself, get out of the way: that he die. For he demands that his father's property be divided among his heirs, and this is what would happen if his father were to die.

"And he divided unto them his living." The father obliges his son. He divides his property into two parts, assigns to each son his part, and makes these parts available to the two sons.

"And not many days after the younger son gathered all together, and took his journey into a far country, and there wasted his substance with riotous living." When his father obliges him, the son at first stays at home for awhile. But then he begins to find his life at home offensive. And since he has no need to be there, where the presence of his father and elder brother are irritating reminders of his disloyalty, and since he can live well in just as fine a place elsewhere, he collects his part of his father's estate and goes off to a far country. Once in the far country, he behaves in a new way, a way thoroughly in keeping with his new freedom and independence. He is his own man there.

What has happened? By denying his father's life, and his life in his father's house, he has done all he possibly can to un-son himself. He has, therefore, at the same time done all he can to un-father his father. He has broken two relationships: the relationship which he had to his father, and the relationship which he had, through his father, back to himself as a son. For him, his father is no longer a father; for himself, he is no longer a son.

What does it mean for the son to take offense at his father and at his life in his father's house? It means for him to resent the presence of his father, and of the order of things at home, because they do not provide him with what he thinks he deserves to have from them. It means that he thinks he has a claim to have things turn out the way he wants them to because of some merit of his own which he has just by virtue of being alive. It means that he thinks he is just, that his justice has no root besides himself, and that this justice within him makes him worthy of getting whatever he wants. He is convinced that his deserts justify all his desires. For him to take offense does not require that anyone have given him offense. Offense does not have to be given in order for it to be taken. His father has done nothing to offend his son, and yet the son is offended at him.

"And when he had spent all, there arose a mighty famine in that land; and he began to be in want. And he went and joined himself to a citizen of that country, and he sent him into his fields to feed swine. And he would fain have filled his belly with the husks that the swine did eat: and no man gave unto him." Want and perhaps self-pity now preoccupy the consciousness of the son. He is no longer intent on leading an independent and sovereign life. Rather, he is glad enough to submit himself to someone who can promise to give him enough to eat in exchange for some kind of hard labor. But even this turns out to be an illusory hope: he does not get enough to eat to satisfy his bloated appetite, and no one will give him anything in addition: he has no friends—and if he is not to live in utter misery, he will have to steal from the husks assigned to the pigs, that is, he will have to go out by night to feed at the pig trough. He is in a condition of extreme abjection—he has nothing of his own now: no family, no property, no friends, and no assurance whatever about tomorrow. And he has no memories that do not sharpen the pain of his present condition.

"And when he came to himself, he said, 'How many hired servants of my father's have bread enough and to spare, and I perish with hunger!'" He suddenly remembers a far more comfortable place of work for servants than the one in which he now is, and he sees his current situation in strong contrast to the remembered one. But to recall this comfortable place is to recall that this place is his father's place. It is, that is, to recall his father. He remembers that his experience is of his own home, and that there is (or was) at this home one who is (or was) to him "my father." But to recall his father is for him to remember that his father is not only just to his servants but gives them more than they deserve. They have bread "to spare." Because he can remember his father now, he can begin to have hope for a way out of his condition. He has an "in" at his father's homestead, as it were.

However, he necessarily also remembers that he is the son of this father. And he cannot remember his sonship without remembering that he has tried to rid himself of this sonship. No sooner does his father's superior condition come to mind, and, with it, his remembered being as the son of his father, than there comes to him also the memory of his having taken offense at his father and at his father's house and of his having cut his father out of his life by asking for the inheritance prematurely and leaving home with it.

Sketches by Lydia H. Sparrow.

And he now begins to contrast the memory of the largesse of his father with the niggardliness of his present master. And he realizes that this is the man he wanted to die. A feeling of dismay and shock and revulsion at himself, overcomes him. What a good father he had! And he never knew it! What a terrible offense he must have given to his father! And how terribly his father must now be offended at him. He takes offense at himself as his father's would-be murderer. He now abhors himself. The sonship to which his memory has brought him is the one which he has wrongfully destroyed.

"I will arise and go to my father." Yet his needs are pressing, there is probably no famine in that land of his father's, nothing else is available, and there may be work for him there. Despite his offense he must return home or perish. But a return means that he has to face his father, for it is his father who will hire him. More than that, however, he has to acknowledge before his father his wrongful destruction of himself as a son and of his father as a father. He has deeply offended his father, and he knows that he cannot approach his father with any request without the matter of his having broken their relationship to one another being confronted. At the same time he thinks the generosity of his father makes him approachable.

"And say unto him, 'Father, I have sinned against heaven and before thee. . . .'" This will be his confession to his father. It is doubtful that much can be said by way of explaining a most compelling moral fact, the fact that when we see persons again whom we think we have in someway wronged, and whom we have not seen for a while, we must, before

anything else, if we are to be able to live with ourselves, confront that past with a confession of wrongdoing. It seems that we want to remove the offense we have given them by telling them we were wrong to take offense at them in the first place. Perhaps we sense that we hurt them by taking offense at them, and now, by telling them we do not take offense at them any more, we hope to heal that hurt.

"'. . . And I am no more worthy of being called thy son." The son wants his father to know that, although he may be his father's blood offspring, he has destroyed the moral foundation for any obligation that his father might have to him. Nothing now flows from his being the offspring of his father. He is dead as a son, just as his father must be dead as a father. And so he determines to pronounce his condition of non-sonship. He determines to appear before his father as would any other laborer seeking a position from a rich and generous landlord.

"Make me as one of thy hired servants." Once the truth of his wrongdoing has been acknowledged, he will make his request to be allowed to serve his father like any other hired hand. However, because the rich and generous landlord is his father whom he has wronged, the request to be treated as one of the hired servants cannot avoid having a penitential dimension or even perhaps cannot avoid being in fact a request for a life of penance in permanent exile from his father's house. Before any other rich employer the famished son might say, "Make me one of thy hired servants." But since it is his father who is the landlord, and since it is he, the son, who has offended him, he has to say "Make me, i.e., your son, *as* one of thy hired servants." That is, pay no attention to what I would deserve from you if I were your son. Do not look at my former sonship. Do not give me what a father should give a son. Give me, rather, what as a sinful ex-son and patricide I deserve, and what as a hungry stranger I beg: the opportunity to earn my bread by being merely one of your hired hands. He will ask that his father give him the suffering that he deserves to have by virtue of his wrongdoing.

"And he arose, and came to his father;" the son starts to carry out his plan.

"But when he was yet a great way off, his father saw him, and had compassion, and ran, and fell on his neck, and

kissed him." Things do not, however, go according to the son's plan. It is still as a father that the old man sees his son when he is yet a great way off. He sees that he has walked through the famine-ridden land a great distance, and that he is desolate, hungry, ragged, but determined to see his father; and it is a father that, moved with pity, runs to greet his son, fall on his neck, and kiss him. There is no indication in the story of how far the father has to run to find his son, how rough the terrain is or how old he is, but there is no reason to suppose that the father is not looking out anxiously for his son during the whole time of his absence, that he does not have good eyesight, that he does not run as fast as he can, and that there are smooth paths on which to run. In short, there is no reason to suppose the father does not exhaust himself running out of his house to greet his son.

Why do things not go according to the son's calculation? Why does not the father wait for his son to knock at the door of the house and make his request as his son had thought he would? Because the son does not know his father, i.e., he does not know that his power to break off his relation to his father has an uncrossable limit, a limit which is determined by his father's love for him. Although he may on his side un-son himself and un-father his father, he cannot, by this action, make his father do to him the very same thing that he has done to his father. He cannot make his father un-father himself and un-son him. If the father does not take offense at his son for having taken offense at him—that is, if the father does not condemn his son, although his son has condemned him—he may remain the father of a son and his son may remain the son of a father. The son does not have the power to make his father condemn him if his father does not himself will to condemn him.

And the father does not will to condemn him. The father, seeing his son returning openly to his home after all these months in his wasted condition, understands that his son has determined to meet him and acknowledge his wrongdoing. He understands that his son will avow that he has broken the relation that he had to his father; he understands that his son regrets the hurt he did to his father when he condemned him. He understands that his son knows that his father has never given offense to his son and only deserves good things. The father understands the remorse that his son is now feeling, and he sees his humility. He is aware of the offense that his son, in his repentance, is now taking at himself. He knows that the closer his son gets to his house, the more he feels the anguish of having done wrong. And out of his sorrow for the pain that he knows his son is experiencing, the father rushes out to reassure his son that he has never taken offense at him for his disloyalty. When he falls on his son's neck and kisses him, he presents himself to his son as his father; that is, he tells his son that he is indeed his son's father and has always been so; that his son is indeed his son, and has always been so. He enacts his thought in his deeds. He has never abandoned his son although his son has abandoned him. He has never thought of himself as not his father. He has never taken offense at his son, and so his son has never offended him, has never given him offense. His relation to his son, his son's relation to him, and the third thing that springs out of their mutually recognized relations to one another, their mutual love for one another, is all that matters to him.

"Father, I have sinned against heaven and in thy sight, and am no more worthy to be called thy son." The son then makes his confession in preparation for his request. The son begins to make his speech. But his father interrupts him, and does not let him make his request that he be made as one of the hired laborers. When he draws back from his embrace of his son, and when he looks into his son's eyes with tears of joy on his face, he hears his son call him "father" and he hears him make his avowal of wrongdoing.

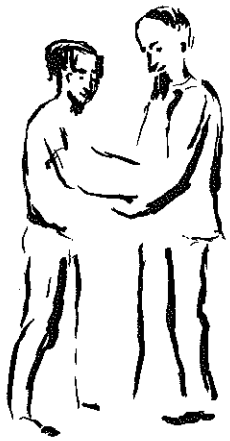
"'Bring forth the best robe, and put it on him, and put a ring on his hand and shoes on his feet. And bring hither the fatted calf, and kill it; and let us eat, and be merry. For this my son was dead, and is alive again; he was lost, and is found.' And they began to be merry." In his joy the father orders that the best robe, presumably his own, be brought for him; he has a ring, symbol of union, put on his finger; and he orders the fatted calf, perhaps prepared every year for just this moment, killed in honor of his homecoming. It is meet to do this. His son was dead, and is now alive. Since the son was always in some sense alive, what the father means is that his son is now again alive as his son when before he was dead as a son. His son's un-sonning of himself and his un-fathering of his father has been undone. From his son has soared again the relation to a father. The destruction of the relation has itself been destroyed. Father and son once again, or perhaps for the first time, can meet one another in the freedom of the mutually recognized love relationship. In his father's recognition of him as his son the son can recognize himself as a son and his father as a father. In his son's recognition of him as his father the father on the other hand can recognize himself as a father and his son as a son.

When the father says that his son was lost, and is found, he means the same thing. His son was lost as son. His father looked, but could not find him, i.e., his son was not there, next to him, in his proper place, next to his heart. He was lost, not so much in the sense that his father did not know where he was, as in the sense that the son himself did not

know where he was. And when the father says his son is found, he means, likewise, not so much that the father now knows where his son is, as that the son now knows where he is; that his being is to be near his father as son; that he can say "I am found."

The son says nothing more during the story. I think we have to assume from his silence that he concurs in his father's judgment—at least for awhile. He was dead, and now he is alive. He was lost, and now he is found.

So much, then, for the story. Where is the forgiveness? When does it happen? How does it happen?



Let me approach these questions by first making some remarks about the word "forgive." The word "forgive" is one of the class of English words whose prefix, the prefix "for-," has the effect of undoing what the root words posit. Thus the "for-" in "forget" undoes what "get" posits. The "for-" in "forbid" removes what "bid" posits. Similarily, the "for-" in "forgo" and "forswear" deny what "go" and "swear" assert. To "for-give" is thus to "un-give" or "de-give," i.e., to take away. Confirmation that to forgive means to take away comes from an examination of the other expressions that are used to express forgiveness in English. There are three of them at least. They are "pardon," "remission," and, of course, "taking away," itself. Of these, the first, "pardon," is evidently nothing but an English adoption of the French "pardon." But "pardonner" is the French word for forgive. And the parts of pardon "par-" and "donner" exactly reflect the English "for-" and "give." The English "for-" is the very same word as the French "par-" and "give" is "donner." (The German word for "forgive," "ver-geben" is also composed of the two same elements, "for-"—"ver", and "give"—"geben.") The second English word, "remission," is based on the Latin "remittere." And this word means to send back, and so also to take away.

But if to forgive is to take away, what is it that the forgiver takes away? The evident answer is "sin," "trespass," or "debt." Although we speak often of forgiving somebody, the more customary usage always makes the "somebody" forgiven the indirect object of the action of forgiving rather than the direct object. The direct object of the action is always either "sin," "trespass," or "death." "Forgive us our trespasses" is probably the most common expression. Sin is always forgiven, or taken away from, someone.

But if forgiveness implies the presence of sin, to see where there is forgiveness in the story of the prodigal son, we first have to see what sin the prodigal has in him when he is with the pigs and that has been taken away by the time he gets to the feasting. And then we have to see how this sin is taken away. What does the son have when he is with the pigs that can be called "sin" and that can be taken away?

There are several senses that the word "sin" can have, of which three are very prominent. But of these three, only two have a sense that allows a meaning of something that can be taken away quickly. The first has to do with a human act, a deed, a temporal phenomenon, such as a killing, a slandering, or a thinking evil of someone. Such a thing has a temporal beginning, middle, and end. It is a being of time. It is finished when the time of its performance is over. There is nothing that remains behind to be taken away. The very act carries with it its own destruction. The act of sin disappears in the first moment that succeeds the last moment of sinning. True, the memory of it remains, but that is not itself a sin. It is his memory of his having committed acts of this sort, acts of sin, that leads the prodigal son to say, "I have sinned. . . ." Clearly, however, those acts are no longer with him. They have ceased to be. They are not forgiven him by his father because they were forgiven by the first instant of non-sinning.

A second sense of the word "sin" has to do with the internal dispositions that lead to a sin in the sense mentioned above. This is a sense of the word "sin" that is used in the phrase "seven deadly sins." It is sin in the first sense, the sense of acts of sin, that finds its appropriate response in the circles of hell imagined by Dante in his *Inferno*, but it is sin in the sense of a disposition, or a vice, or habit, for example, anger, greed, envy, lust, that is purged on the various terraces of Mount Purgatory. Here too, although perhaps not so clearly, we must say that the son's sins have not been forgiven by his father by the time he gets home. But this is for a totally different and even opposite reason from the other. It is because such dispositions are not readily or instantaneously made to disappear.

A third sense of the word "sin" is a sense of the word in which it means the condition that results from an act of sin, the condition of guilt. This condition is an abiding sense of dislocation, discomfort, anguish, or anxiety. The "Ennui" of which Beaudelaire speaks in his preface to the reader, the "Vrai rongeur" of Valéry's *Cimetière Marin*, and the disorientation and sense of alienation of modern times, all have something to do with it. Within it lies the fear of death, the terror of the abyss. Unrepentant guilt leads to fear of discovery, to lying, and to the destruction of what threatens to expose it. Repentant guilt leads to a desire for confession and punishment, to a desire to place all worth and justice in the one whom the sinner has offended, to the acknowledgement of deserving condemnation, and to a fear of its being immi-

nent. The word "sin" is used to mean guilt in the phrase "original sin" and "sin came into the world." Sin in this sense, i.e., guilt, can be taken away if the fear of death can be replaced by the hope of life: if the source of condemnation turns out not to condemn at all.

The son is in the condition of repentant guilt as he returns home. He is quite sure that his father will think that his return is presumptuous: an attempt to count on a broken relationship, and so he determines to proclaim right away that he renounces any claim to special treatment as a son. He determines to put himself in the position of a suppliant, not of a claimant. He intends to ask only for the position of a servant, not for the status of a son. He only wants the opportunity to serve out a life in penitential exile from his just father. He thinks his father may refuse his request, and he knows that he cannot contest such a refusal.

He is convinced that his demerits make him worthy, at most, of being a hired servant of his father for the rest of his life and if need be, of returning to death in the land of famine. The demands of justice are clear to him. Only something he thinks is wholly different, mercy, can save him.

He is not so convinced of the power of his guilt, however, as to make his forgiveness impossible. We will see later what would happen were he to dwell on his worthlessness and so refuse to accept the robe, the ring, the shoes, the fatted calf, and the merrymaking because they are not what he deserves.

It is clear, then, that the son, as he returns, is in sin, and that this sin is his guilt, his fear of death based on his conviction of his deserts. He does not know that he deserves absolutely nothing in his own name from his father, not even a life of penance.

How can the father forgive his son this sin? How can he take away this ignorance from his son? How can he make his son know that he does not deserve bad things from his father? He can do so, and he does do so, by running down to embrace his son and, embracing him, telling him that he deserves only good things from his father. The father's exhausted and tender grasp of his penitent son, and his gifts to him, rid the son of his ignorance about what he deserves in fact from his father. The father's gesture reveals to his son that in his father's eyes he has only merits and that those merits are his only because his father loves him.

What is it then to forgive sin? It is to remove from the one forgiven his assurance of condemnation by the one who forgives him.

We can now try to answer some of the questions which were raised earlier. Can sin be forgiven if the one who is to be forgiven does not first ask for forgiveness? Yes. The prodigal son never asks for forgiveness. All that is necessary in him is repentance and a willingness to face the possibility that he is in ignorance about the power of his wrongdoing to prevent his being loved by his father. This willingness constitutes in him the capacity to have his sin forgiven.

Does forgiveness differ from forgetting? Yes. The two are almost direct opposites: forgiveness is a taking out of ignorance; forgetting is a plunging into it. Can one forgive oneself? No. Forgiveness presupposes an ignorance that wrongdoing cannot compel condemnation. But only another's telling a penitent that he does not condemn him can remove that ignorance from him. For a penitent cannot in good conscience tell himself that he does not deserve to suffer.

Is it possible to forgive someone who is not repentant? No. Why? Because such a one is in ignorance not only about the impotence of his wrongdoing to compel condemnation. He is in ignorance about something prior to that. He thinks he deserves to have something good in his own name. To see how this is so, we must look at the story of the elder son.

> Now his elder son was in the fields; and as he came and drew nigh to the house, he heard music and dancing. And he called one of the servants, and asked what these things meant. And he said unto him, "Thy brother is come; and thy father hath killed the fatted calf, because he hath received him safe and sound." And he was angry, and would not go in: therefore came his father out, and entreated him. And he answering said to his father, "Lo, these many years do I serve thee, neither transgressed I at any time thy commandment: and yet thou never gavest me a kid, that I might make merry with my friends: But as soon as this thy son was come, which hath devoured thy living with harlots, thou hast killed for him the fatted calf." And he said unto him, "Son, thou art ever with me, and all that I have is thine. It was meet that we should make merry, and be glad: for this thy brother was dead, and is alive again; and was lost, and is found.

Let us look at this story carefully also: "Now his elder son was in the fields; and as he came and drew nigh to the house, he heard music and dancing." It is the end of the day, and the elder son is returning home. But he hears unusual noises coming from the house.

"And he called one of the servants, and asked what these things meant." Music and dancing! What does this rejoicing mean? What can there be for his father to rejoice about? His

father has been anxiously looking for that younger brother of his all these months. Can he have come home? Can the music and dancing be for that no-good wastrel? The elder son is on his guard. He does not trust his father. Before he can join in the celebration, he must judge whether the occasion for it is fitting. He must find out what this is all about.

But he must do so without showing himself. For if his younger brother has come home, he doesn't want to make a scene in the house in front of all the servants and musicians. And so he does not run to the house but stops nearby.

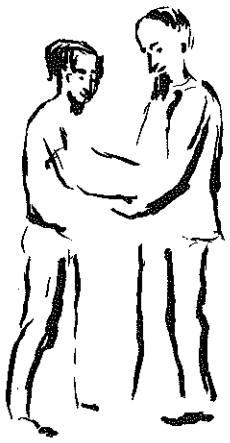
"And he said unto him, 'Thy brother is come; and thy father hath killed the fatted calf, because he has received him safe and sound.'" The servant tells him that his brother has indeed returned, and he tells him what his father has done in his joy.

"And he was angry, and would not go in." The news confirmed the elder son's worst fears. Floods of resentment swirl within him. He feels the burning constriction in his chest that blocks out thought in a turmoil of rage and hate, and he proceeds no further. No, no, no,—this is not for him, this music and dancing. His father has done a terrible thing. It is all wrong, all unjust. It is an abomination. It should not be. His father has wronged him terribly. He has in no way given him what he deserves. His father should never never welcome in this way this brother of his who has used up so much of the family fortune, and, even worse, used it up by spending it on doing wrong! Here he has been working in the fields all day long for years, helping his father, and such a reception has never been given to him on his return home. But the minute this no-good son of his father returns, his father kills a fatted calf for him and orders music and dancing. No, no, no. It is too much!

"Therefore came his father out." Perhaps a servant has told the father about his son's angry reaction to the news. Perhaps the father, waiting to tell him the news when he got home from work, has been looking out for him, and, seeing him stop on his way home, runs down to tell him. In any case, once more, the father goes out to greet a son who has taken offense at him.

"And entreated him." But the meeting with this son is very different from the meeting with the younger son. The elder son does not speak first. And the father does not fall on his son's neck and kiss him; or if he does, the son draws back from him in anger. When the father ran to greet the younger son, the younger son was moving painfully but steadily towards home. He spoke first, and his first word was "Father." Now, however, the older son is standing still, scowling in anger at this man whom he calls his father. The sullen silence moves his father to speak first and urge him to enter the house. He implores his son to join him in the merrymaking. But the son refuses.

"And he, answering, said to his father, 'Lo, these many years do I serve thee, neither transgressed I at any time thy commandment; and yet thou never gavest me a kid, that I might make merry with my friends. But so soon as this thy son was come which hath devoured thy living with harlots thou hast killed for him the fatted calf.'"



Why does the son speak? He speaks to answer his father's plea that he come into the house and make merry with him. He speaks to justify his refusal to comply with his father's request, to justify his remaining outside. He knows that his staying outside hurts his father and is contrary to his will; that it is, for him to dishonor his father. And he thinks he must justify himself to his father. His justification is that the hurt he inflicts on his father is a just punishment of his father. His depriving his father of the joy his father would take in his presence at the feast is rationalized by him into a punishment; as a justifiably inflicted hurt. His father deserves punishment because he is guilty of injustice toward him. His father has wronged him by giving him less than he deserves. His father has given "this thy son . . . which hath devoured thy living with harlots," "the fatted calf," whereas to him who "served thee these many years neither transgressed . . . at any time thy commandment" he "never gave[st] . . . a kid." If justice is giving to each his due, the father is not giving his sons their due. He is not just. The worse is getting the better. The superior son is getting less from his father than the inferior son. Such a crime deserves punishment, and the elder son is prepared to punish his father by staying out of his father's party.

"Son . . ." The father begins to speak and addresses the elder brother as "son". He shows with that word that he still considers him a son, and himself a father, although this same son has condemned him as unjust—although he, too, like his younger brother has un-fathered him and "un-sonned" himself. The older son has done that because, by referring to his brother, before his father's face, as "this your son," rather than as "my brother," he has said that since the younger son is not his brother, the father of that son is not his father.

"Thou art ever with me." This is as much as to say, "you have all that you deserve as my son. You have all the comforts of the house and of a land where there is no famine. You have also the opportunity to be near me, to know me, and to learn from me, and you have had these all your life." More importantly, these words mean "you are ever in my thought and love. Your welfare is always on my mind." In other words the father tells his son, "I have always been, and still am, everything to you that a father should be."

He then adds, "And all that I have is thine." Not only has he given his son what his paternal relation requires: he has gone far beyond his son's deserts by giving him prematurely his share of the family property, as we saw earlier, and he now reminds him of this. So much, then, for the verdict of guilty on the charge of injustice because the elder son has gotten less than he deserves. Just the opposite is true. He has gotten much more than he deserves. The father is not guilty.

Why does the father speak, since he has been already condemned by his son and is now suffering punishment? To lighten the punishment? Only indirectly. Yes, of course his son has hurt him, and he wants the elder son to join him in the celebration. But this is not for his sake. It is for the elder son's own sake. He speaks because his delight is in the knowledge that his sons are in delight. He therefore speaks not to be declared innocent before his son's justice but to give him the chance, by considering his words, to withdraw his charge against his father altogether. He wants to give the elder son a chance to see that he is good and generous. He wants him to stop taking offense at him and he wants him to begin to take offense at himself for speaking this way so that he can then forgive him.

"It was meet that we should make merry, and be glad." The father meets the elder son's objection straight on. That objection is that it is not proper to celebrate the return home of a worthless spendthrift and sinner. His father contradicts him. He says that it is meet to do that. Why?

"This thy brother was dead, and is alive again. And was lost, and is found." The elder brother has condemned his younger brother just as he has condemned his father. But his father points to his continued love of his younger son. The younger son has remained the son of his father even in his worse excesses. Because of this the same son can be at one time dead and then alive, lost and then found. The elder son does not know the love that the father has always had for the younger son. He does not know his father's burning desire that the younger son be with him always—just as the older son is—for the sake of the son's own happiness. It is meet to make merry, says the father, because now the younger son can be where the elder son has been all along.

The elder son now is in exactly the same position as his brother once was. But he does not know it. He still thinks he deserves something in his own name. He thinks he deserves not to have a brother who has behaved as his younger brother has behaved and that he deserves not to have a father who treats his younger brother in this fashion. Can this sin of his be also forgiven? Can the father remove the ignorance from him as well as from his younger son? The parable does not exactly say, but the context in which it is told suggests that he cannot.

If the younger son had said in an outraged voice to his father, condemning him, "Father, I have devoured thy living with harlots, and you propose to have the fatted calf killed for me on my return! What kind of justice is that! What kind of father are you? And look! What have you done for my brother? He has served you these many years, and he has never transgressed a single commandment. But have you ever given him so much as a kid, that he might make merry with his friends? A fine father you are!" If the younger son had spoken this way, he could not have been forgiven by his father. He would have refused his embrace and refused the gifts his father offered to give him as unjust.

But the younger son does not act and speak this way. Conceptions of the things he deserves to have in his own name, even though they be bad things, are not at the foundation of his life. But it is not clear that this is the elder brother's case. The elder brother's life may well be centered on conceptions of what he deserves to have because of his own innate justice. The parable stops at the father's last words to him, and it may be that he will finally enter the house. But it looks more as if because of the strength of his conviction of his own merits he will not repent and so will continue to be ignorant of the nonexistence of his merits. Hence his father will probably also not be able to reveal himself to him as one who gives him everything and cares nothing about his wrongdoing.

Is it possible to forgive someone who is not repentant? No. Why? Because as the parable tells, to forgive someone is to reveal to him that offense has never been taken at him by another from whom he has everything that he deserves. But if someone is not repentant, he still thinks he deserves to have things in his own right.

Finally, we must ask who can forgive? Only he who, loving deeply, very, very deeply, is willing to drink the cup of death in utter desolation in order by revealing the depth of that love to show the ones he loves that he never has condemned and does not now and never will condemn them.

Freud's "Dora"

by Alan Dorfman

I shall tonight examine the evidence for Sigmund Freud's theory of psychoanalysis. More exactly, I shall examine the evidence as it appears in *one* of his case histories and consider his theory as it appears in one domain, that of the psychoneuroses.

All who read Freud's *General Introduction to Psychoanalysis* must be impressed by his claim that his theories derive from his own extensive observation and treatment of psychoanalytic patients, an experience which is inaccessible to his critics, and to the ordinary reader. A psychoanalysis is a private affair, which cannot be observed by the outsider, nor even adequately described to him. To judge fairly of his theories we must trust Freud, or else ourselves become analysts or analytic patients.

Nevertheless, since Freud did write some, although not many, detailed case histories, he does offer us some opportunity to stand on his own ground. I believe it can aid our judgement of psychoanalysis, to study these case histories.

The one I have selected tonight is entitled "A Fragment of an Analysis of Hysteria". It is a *fragment* because the patient—named "Dora"—broke off her analysis abruptly at the end of but three months. It is the first of Freud's psychoanalytic case histories, and the most complete. It was written at the turn of the century, and there is reason to think Freud regarded it—along with his most important work, *The Interpretation of Dreams*—as marking the beginning of a new era of mankind, in which man would finally understand himself scientifically, and guide his course by that science. Of the Fragment itself, Freud wrote, in a letter to a friend: ". . . it is the subtlest thing I have so far written, and will put people off even more than usual."[1]

Our limitations will be severe. We will be unable, for example, to explore in depth the issue of the unconscious. We will be limited to telling a psychoanalytic story written when psychoanalysis was young and most simple. We will be able, in fact, to tell only part of that story, leaving out much that Freud would consider important.

The lecture divides itself into two parts, namely (1) The Story of Dora and (2) My reflections on that story. There will also be a brief epilogue.

Part I. *The Story of Dora*

The story concerns a young woman, "Dora", turned 18, suffering from a variety of hysterical symptoms, which have gotten noticeably worse the last two years. She has become isolated socially, complains life is meaningless, and has even threatened suicide.

Others, who, besides of course Freud himself, play a role in Dora's life are:

Dora's Father, who brings Dora to Freud, and in Freud's words, hands her over

Herr K, a friend of Dora's father, and, in earlier days, a frequent companion of Dora

Frau K, Herr K's wife, and Dora's father's mistress

A *nameless governess* of the K's

A *nameless young man*, who sends Dora a Christmas present

Dora's mother. Freud regards her as suffering from "housewife's psychosis", and being somewhat of a pest, but of little consequence. As a rule, mothers have but a small role in Freud's case histories.

We are first introduced to Dora by her father, who describes to Freud what he thinks the problem is, while she, I assume, is sitting out in the waiting room.

Two years ago, he says, when Dora was 16, she was supposed to spend the summer with the K's in a house they had in the lake region. He had accompanied her there, but when,

This is the text of a lecture given in Annapolis on 20 May 1977, and in Santa Fe on 3 March 1978. Mr. Dorfman graduated from St. John's in 1963 and joined the faculty in 1974, after further studies at the Johns Hopkins University and teaching in the Math Engineering Division of Catonsville Community College.

several days later, he was about to depart, she insisted on leaving with him, and wouldn't explain why.

Only some weeks later did Dora tell her mother that Herr K had tried to seduce her, as the two of them were walking by one of the lakes. He had written Herr K at once demanding an explanation. Herr K claimed to know nothing of any such incident. Frau K had informed her husband that Dora had lately taken to reading Mantegazza's *Physiology of Love*, and other such stuff. The scene she described was no doubt the product of a teeming imagination. Since then the K's and Dora had not spoken to each other.

" 'I have no doubt,' continued her father, 'that this incident is responsible for Dora's depression, and irritability, and suicidal ideas.' "

Now Dora is always bothering him to break off relations with Frau K, but he can't do this. It is an honourable relationship, and he can't disturb it for the sake of Dora's phantasies. Can Freud do something?

Dora's analysis begins, and she soon tells Freud of another, earlier, incident that was, he says, "even better calculated to act as a sexual trauma." She was 14.

Herr K had arranged for them to be alone in his shop, had closed the shutters, and then had passionately kissed her. She had felt disgust, and, without saying a word, run out of the shop. Neither she nor Herr K mentioned the incident again, to each other, or to anyone else, except now, Dora to Freud.

Freud notes the *disgust* Dora felt, the lack of pleasure at a sexual approach. He says, "I should without question consider a person hysterical in whom an occasion for sexual excitement elicited feelings that were preponderantly or exclusively unpleasurable. . . ." A healthy girl, in Freud's view, would have responded genitally, and not in her alimentary tract, where Freud locates disgust. The disgust could not have been due to the person of Herr K, whom Freud had met, and found "of prepossessing appearance". Freud, in a lengthy theoretical aside, elaborates his view of the roundabout sexual and somatic mechanism of Dora's disgust.

We note, that besides Dora's disgust, there was also her pervasive silence. She runs from K wordlessly. Afterwards she neither complains to him, nor confides in anyone else. We are intrigued to know what Dora's silence means. What was she feeling? And we wonder if her absence of speech concerning such an event can be without consequence. Freud does not pursue these questions.

Curiously enough, one of Dora's symptoms is *aphonia*, a loss of voice which can last for weeks. This *symptom* should be sharply distinguished from the simple act of not talking. There is a difference between not being able to bring forth sounds, and not attempting, or wanting, to speak.

As the analysis proceeds, Freud surmises two things:

(1) Dora is in love with Herr K, and she matters to him, and

(2) the incident at the lake actually occurred.

Let me elaborate.

After the attempt behind the shutters, K began to woo Dora, sending her numerous presents, giving her flowers every day for a year, whenever he was in town. These, of course, young Dora accepted, as well as his frequent company. Her parents, who to be sure knew nothing of the kiss, saw nothing strange in this married man's behavior.

Freud interprets Dora's aphonia in terms of a love on her part for Herr K. He used to go away on business for short periods of 3-6 weeks. Dora's loss of voice, Freud asks, how long did it last? 3-6 weeks. Now Dora's sharp eyes had noted how Frau K would get sick, just when Herr K returned home, revealing in this way her lack of conjugal affection. Was not Dora's case just the opposite: she would be ill just when Herr K was away: it was as if she said, now there is no one left worth talking to.

Dora, however, adamantly denies that there is anything between Herr K and herself. Freud has a hard time getting her to talk about him. She is much more interested in complaining about her father, whom she accuses of carrying on a relationship with Frau K, the true nature of which he disguises. She declares he is hypocritical, dishonest, and interested only in his own pleasure. In her most bitter moments, she complains that he had formerly handed her over to Herr K as a kind of barter for Frau K.

Although Freud thinks her charges against her father have foundation, he notes that these complaints of Dora's did not arise till after the lake incident. Prior to that moment Dora did little to discourage her father's affair, and, in fact, tacitly encouraged it.

What happened at the lake?

Dora had been at the K's resort home for several days. One morning, Dora and Herr K went for a trip together to one of the more distant lakes. In the midst of a walk, they stopped and Herr K lit up cigarettes for Dora and himself. He began a long speech, the intent of which soon became clear. He said, "You know I get nothing from my wife. . . ." This is the only sentence Dora actually remembers. But it was enough. Dora slapped Herr K and ran off.

On the return home, apparently by steamer, K again approached Dora, pleaded for forgiveness, and asked for secrecy. Dora turned away, and did not reply.

Later, in the afternoon, Dora was in her room napping, when she woke to find Herr K at her bedside. She asked him what he was doing there; he left, but not before replying that it was his house, and he could go where he pleased.

Dora got a key from Frau K and locked the bedroom door that night, fearing an intrusion. Sometime the next day, she realized the key was missing, and suspected Herr K of taking it.

She left the K's three days later, with her father, and some time afterward told her mother of K's proposal.

Freud thinks that, despite the offense, Dora still loves Herr K, but out of pride and other motives, she denies the very existence of any such inclination to Herr K. Only a powerful inner force could bury it so effectively. Dora, thinks Freud, has raised from the depths a passion for her father, active in childhood, but dormant since, and now calls on it, as it were, as a substitute for, and protection against, her feelings for Herr K. She flees a real affair with Herr K, by indulging in unconscious phantasies of relations with her father. This re-

newal and exaggeration of her old love for her father accounts for her jealous intrusiveness in his affair with Frau K.

It is interesting to note here that the psychological movement, as Freud describes it, is not from father to Herr K, as we might expect, but from Herr K to father. Herr K is not here viewed as a father substitute; rather her father is a Herr K substitute. The movement is from the later to the earlier relationship.

All this is soon confirmed by a dream. Here it is: "A house was on fire. My father was standing beside my bed and woke me up. I dressed myself quickly. Mother wanted to stop and save her jewel case, but Father said: 'I refuse to let myself and my two children be burnt for the sake of your jewel case.' We hurried downstairs, and as soon as I was outside I woke up."

The dream, it turns out, is a recurring dream. Dora recalls having dreamt it at the lake, and, as it seems, on those very nights after K had taken the key from her door. The dream, Freud suggests, represents a *resolution* to get out of the house in which she feels herself endangered. In the dream, her father replaces the dangerous Herr K, by her bedside, and leads her to safety. And, of course, in actuality, she does take advantage of her father's leaving, a few days later, to leave herself.

Freud continues at length his analysis of the dream, focussing on the sexual inclinations and worries of Dora as a child. The image of her father beside her bed in the dream, seems to reflect the distant memory of when he would wake her in the night to prevent a bedwetting incident.

Thus, in repressing her desire for Herr K, Dora retreats to her father, who stood by her, lovingly and protectingly, when she was a child.

But Freud asks himself: "If Dora loved Herr K, what was the reason for her refusing him in the scene by the lake? Or at any rate, why did her refusal take such a brutal form?"

The analysis goes on. Dora has a second dream, in which her father is dead, and she is a wanderer. We shall not go into it in detail. Suffice it to make the following assertions:

(1) The dream reflects a revenge phantasy against her father. Freud is emphatic concerning Dora's "morbid desire for revenge" against her father, and K, and, as we shall see, against Freud as well.

(2) Dora associates a scene in the dream to a certain young man, who has shown interest in Dora, and has recently sent her a Christmas present. Freud thinks he may have matrimonial interests.

(3) Some nine months after the lake incident, Dora had serious stomach troubles, which the doctors had uncertainly diagnosed as appendicitis. She had also a difficulty in her leg, so that she had to drag her foot, a fact the dream recalls. Freud suggests that this difficulty with walking was Dora's symptomatic way of saying, she'd taken a false step. In her unconscious phantasy, she had *succumbed* to Herr K at the lake, and nine months later, manifested her "pregnancy". Dora does not object, as she usually does, to Freud's suggestion, and he takes her silence for assent.

The last day of the year comes and Dora begins her session by saying, "Do you know that I am here for the last time today?" and Freud replies, "How can I know, as you have said nothing to me about it." Dora indicates she had decided to put up with the treatment until the New Year. Freud says: "You know that you are free to stop treatment at any time. But for today we will go on with our work. When did you come to this decision?"

One notes that if Freud is pained at Dora's surprise announcement, he does not show it. We should also note the form his question takes. Most of us, I think, would have asked *what* made her come to that decision, but Freud asks *when*.

Dora replies, "A fortnight ago, I think."

Freud remarks, "That sounds just like a maidservant or governess—a fortnight's warning."

Amazingly, this comment touches off the denouement of Dora's story. She responds, "There was a governess who gave warning with the K's, when I was on my visit to them that time at . . . the lake." Freud: "Really. You have never told me about her. Tell me."

Dora tells the tale: this governess and Herr K had been on strange terms. "She never said good morning to him, never answered his remarks . . . and in short treated him like thin air." Not long before the lake incident the governess had confided in Dora: Herr K had seduced her. He had approached her—the governess—saying things like, "I get nothing from my wife".

These words, which the governess reports to Dora, were, of course, the very ones K later used, in addressing Dora herself. Dora must have been shocked and jealous, when he made the same speech to her, which he had made to this other woman. Freud's earlier question, why Dora had behaved so brutally to Herr K, seems answered.

Dora completes the governess's tale: After a while, Herr K had grown tired of her, and they had entered into the silent war to which Dora had been witness. Even so, the governess entertained hopes that Herr K would seek a divorce, and marry her. When this didn't happen, she finally gave notice.

Freud concludes that in telling the governess's story, Dora is telling her own. After giving K a decent interval to approach her again (two weeks in fact), she had told her parents of K's attempt with her in the hope of indirectly inducing K to seek her out. In this way, Freud suggests, her longing for him would have been appeased. To Freud's surprise, Dora actually nods assent.

Freud tells Dora the situation as he sees it. There had in fact been talk between the K's of divorce. It's not impossible that K's speech at the lake was meant to be a proposal, not a mere proposition. Freud points out to her that she had not let Herr K finish his speech, and so can't be sure what he meant to say to her. An arrangement, whereby she would marry K, and Frau K would go to her father, would not after all, Freud tells her, have been so impracticable. Had she gotten preg-

nant, it would have been the only way out, satisfactory to all concerned. (Freud seems here to have forgotten the mother.) This is why she, Dora, so regretted the actual event, and emended it in the phantasy which manifested itself in the appendicitis. Dora must have been very upset, when at Frau K's instigation, Herr K had not only not come to her, but had actually denied her story. Freud reminds Dora that nothing makes her so angry as its being thought she merely fancied the scene by the lake. She *had* thought K's proposal was serious, and that he would not leave off, until he had married her.

Freud tells the reader: "Dora had listened to me without any of her usual contradictions. She seemed to be moved; she said good-bye to me very warmly, with the heartiest wishes for the New Year, and—came no more."

Part II. *Reflections*

It would be hard to overestimate the importance of *symptoms*, for Sigmund Freud. It is the symptoms that reveal a person as neurotic, i.e., as ill, and the symptoms which, by tying up his life's energies, incapacitate him for work and love. Freud extended the idea of symptom well beyond its ordinary usage, to include symptomatic actions and the elements of dreams. His genius lay in determining the *meaning* of these symptoms, that is, of what, in the patient's unconscious thoughts and feelings, they were symptomatic.

Correlative with this emphasis on symptom and meaning of symptom is a depreciation of the idea of *character*. Freud begins one of his essays as follows: "When the physician is carrying out psychoanalytic treatment of a neurotic, his interest is by no means primarily directed to the patient's character. He is far more desirous to know what the symptoms signify, what instinctual impulses lurk behind them. . . ."[2] The notion of *character* as something that leads us to act *despite* influences and temptations, is missing in Freud's work, or barely adumbrated. The word "habit" occurs almost nowhere in his writings. When character is talked of, it is generally as a collection of character traits, that is, symptom-like formations, the residues of early experiences.

The emphasis on and widening of the idea of symptom, and the banishment of character, have an important corollary. Psychoanalytic therapy aims solely at the removal—the permanent removal, to be sure—of symptoms. There is no notion, in Freud, except perhaps late and grudging, of a *character analysis*, that is, of an attempt to turn a person about from one mode of life to another. All there is, is the removal of symptoms, and the shifting of mental contents.

Interestingly, however, symptomology is not the whole story of neurosis for Freud. At one point in Dora's analysis, Freud tells Dora that the whole purpose of her illness is to get her father to break off with Frau K. He goes on to say: "I felt quite convinced that she would recover at once if only her father were to tell her he had sacrificed Frau K, for the sake of her health."

So a neurosis is here regarded, not just as a collection of symptoms, but as a single thing, with an aim, that can be overturned at a single blow, under the right circumstances. There is a purpose, a motive, for being ill.

Freud emphasizes the distinction between the motives of illness and the material—the thoughts and wishes out of which symptoms are formed. This distinction is not easy to understand. What is the difference between the *wishes* from which particular symptoms spring, and the *motives* that actuate a neurosis as a whole? I think what Freud means is that the wishes of a neurotic give rise to fantastic, that is, imaginary, satisfactions, that are embodied in the symptoms. The *motives*, by contrast, are *real*, in the sense that the neurotic is—through his neurosis—really trying to accomplish something. Dora, e.g., is, according to Freud, trying to separate her father and Frau K, not only in her phantasy, but in actual fact.

Not every neurosis seeks to manipulate the environment in this way. Sometimes the motives are, according to Freud, "purely internal—such as a desire for self-punishment." At the very least, "falling ill involves a saving of psychical effort; it emerges as . . . the most convenient solution when there is a mental conflict (we speak of a 'flight into illness'). . . ." This is exemplified in Dora's case, by her flight—both literal and figurative—from Herr K, and her turning to fanciful, but unconscious, satisfactions with her father.

In this regard, Freud, reflecting on the case, raises the question: what would have been Dora's reaction, had Herr K (informed that Dora's "no" was not wholehearted) persisted in his attentions. The result, Freud says, might have been the total overthrow of her defenses, "a triumph of the girl's affection for him over all her internal difficulties." But she might equally well have taken it as an opportunity for revenge, and rejected him again. The repression of her tender feelings for him could have been lifted, or it could have been reinforced. One can't tell which.

Freud elaborates: "Incapacity for meeting a *real* erotic demand is one of the most essential features of neurosis. Neurotics are dominated by the opposition between reality and phantasy." What they long for in phantasy, they will flee from, if it presents itself in reality. Neurosis is the flight from reality into unconscious phantasy.

We should emphasize several things:

(1) Freud is saying a neurosis need not wait for psychoanalysis to be cured. There are more straightforward possibilities. In Dora's case, her father, certainly, and Herr K, possibly, could have acted in such a way as to take away Dora's illness. We wonder, though, whether there was anything Dora herself could have done.

(2) In his willingness to envisage Dora and Herr K together, Freud seems strangely blind to Herr K's moral failings, and his generally poor relations with women. Is it not at least possible that a relationship with K would have worsened things for Dora?

(3) When Freud says neurosis is the flight from reality into unconscious phantasy, he seems to *define* neurosis, and, by implication, distinguish it sharply from normality. However,

he avoids such a definition, and, later, in, e.g., the *General Introduction*, explicitly maintains the lack of a theoretical distinction between neurosis and normality.[3] As an important consequence, the theory of psychoanalysis in his view applies to *all* men, not just to those who are clearly neurotic.

(4) That from which and to which Dora flees is the sexual, retreating from her lust for Herr K, to her lust for her father.

Freud says: "Sexuality . . . provides the motive power for every single symptom, and for every single manifestation of a symptom." And again he says: ". . . I can only repeat over and over again—for I never find it otherwise—that sexuality is the key to the problem of the psychoneuroses. . . ."

In a 1908 essay considering the question why modern man is so much more nervous that his predecessors, Freud allows some weight to factors suggested by others: discoveries and inventions that bridge time and space, increasing competition, hurry and agitation, participation in political life, the stimulation of modern literature, and so on, but he concludes "the injurious influence of culture reduces itself in all essentials to the undue suppression of the sexual life in civilized peoples. . . ."[4]

The case of Dora seems to confirm this. The tale seems to be, in overwhelming measure, the tally of her sexual inclinations and difficulties. Although not all of Freud's interpretations strike us, nor, I imagine, Dora herself, with equal cogency, still, the impression of the importance and relevance of sexuality is inescapable.

On the other hand, reading the story, we also gain the impression that Freud has a particular orientation, and is on the lookout for the sexual. The possibility arises that there are other factors, important in neurosis, which Freud overlooks.

One of the aspects of Dora which Freud the theoretician ignores, even as Freud the storyteller reveals it, is Dora's silence. The fact of her non-speech is striking: it is present during, and after, the kiss when she is 14, and in the crucial incident at the lake, and during her analysis, especially at the end, when she waits till the last hour to let Freud know her plans. Dora, in fact, has the *habit* of not speaking on crucial occasions.

Now it is curious that Freud does not attend very much to Dora's silence. For, in the first place, psychoanalysis is the "talking cure"; speech is the tool of Freud's trade. We might expect to find something commensurate and opposite in the condition it treats. In the second place, *words* have a curious and perhaps important role, as it happens, in Freud's psychology.[5] It is they which allow for the existence in us of that which is distinct from the primal psyche, from the unconscious. In a way hard to understand words give tone and quality to the purely quantitative charges and excitations of the unconscious mind. We should note, though, that there is no good account in Freud, of *speech*, as opposed to *words*, or, as he sometimes calls them, word objects.

In the third place, the symptoms themselves "speak", as Freud puts it, and can even enter into the dialogue, during therapy. Did not Dora's aphonia tell Freud of her love for Herr K? We would be curious to know the connection between Dora's deliberate not speaking on certain occasions, and her occasional helpless voicelessness, lasting for weeks.

It may not be unimportant, therefore, to reconsider Dora's story, especially the crucial lake incident, from the viewpoint of her silence.

To begin with, I think we should assume that Dora was a fairly isolated young person. Her parents, certainly, do not have the proper concern for her. There seems to be no one to whom she feels able or willing to confide important things about herself. It's a lonely and loveless existence.

Now Herr K kisses her when she is 14. He and Dora establish a silent pact of silence on the episode, and then, this weak man, ignored by his wife, begins to pay court to Dora. He brings her gifts and woos her with flowers, beneath her parents' unseeing eyes, for two years.

What does Dora feel for him? We do not, and cannot, know precisely. This much seems clear: he means a great deal to her, and he is the principal and perhaps only buffer against her isolation. It is likely, too, in a ripening young woman that her sexual feelings are stirred up, with all the uneasiness that entails, and that her vanity is tickled. In addition, he is a friend of her father, and she must feel towards him, what a child feels towards grownups: he is one of the revered *them*, someone slightly fearful.

Now K's awkward proposal at the lake, whatever its immediate sexual intent, *could* have the effect of clarifying Dora's posture towards him, and his towards her. K may even have that intention, in part; he is, in effect, asking Dora to drop her childlike and passive role, and tell him where he stands in her eyes. It is important to keep in mind that he does not know about Dora's knowledge of his affair with the governess.

Dora cannot be certain what direction the relation will take, if she speaks, nor can we. If she had spoken—I mean spoken plainly from her heart—it is most likely that at that moment her first expressions would have been colored by an anxious and jealous rage. Herr K is insulting her; he is trying to seduce her with the very words he used on someone else. To have expressed her wrath and the cause of her wrath would have marked the moment as a turning point: this couple would have had to come clean with each other. Their relationship could end, or it could clarify itself into some form of friendship, or into something else. It is impossible it would stay the same; for Dora, by expressing her wrath directly, would have established her young self as Herr K's equal, a being of moral judgement and responsibility. Her words would have stung Herr K much more sharply than her slap. But at least he would then have known the charge, and would have had the opportunity to explain, and to show himself in either a better or a worse light.

Dora does not speak, and by running away, denies Herr K speech as well. Not speaking at this moment becomes decisive for Dora's life, for her relationship to Herr K, and for her neurotic state of soul. By not truly responding to him—by acting out some Victorian pantomime—Dora loses all.

She also keeps all. The relation never has a spoken ending, and, in her secret imagination, can continue forever. Her feelings for Herr K were never acknowledged to him; she can be safe in the thought there was really nothing between them. She can derive the sweet pleasure of the vengeance of denial, at the same time that she denies that anything was ever at stake. She maintains her childish innocence, and her womanly pride. It all remains confused, conflicting, and murky, and Dora soon finds herself in that comfortable and agonizing state of isolation called neurosis.

We now have two stories of Dora, centering on the lake incident, Freud's, which describes Dora as a woman in conflict, and in which her sexuality plays the key role, and another, in which her isolation and her silence predominate.

The impulse to reduce the second story to the first is strong; to see, for example, Dora's silence as the manifestation of some, as yet unknown, sexual inhibition from childhood. But would it not be equally possible to see the first story in terms of the second? Would Dora's sexuality have been so important in her life had she had a decent grounding in the human sphere of speech?

Moreover, it would seem better to take Dora's speechlessness on its own terms, at least at first, and possibly always. We have, by implication, characterized it, as a way of gaining very great satisfactions, with a minimum of effort, or responsibility. Dora can, through it, stay passive, and confused. At the same time, she gets the bitter satisfaction of punishing K, and a sense of being righteous. But that is a false sense, since she treats K unfairly, for she does not give him a fair trial. Her non-speech is a lying non-speech, for it is she who, before K, denies that anything happened at the lake.

But what about psychoanalytic therapy? Is not its effectiveness the warrant of the strict truth of Freud's hypotheses? Let us assume for a moment that effectiveness. In what way must that therapy be understood, to be taken as confirming Freud's theories?

Freud says (in the *General Introduction*): "The solving of [the patient's] conflicts . . . succeeds only when what he is told to look for in himself corresponds with what actually does exist in him. Anything that has been inferred wrongly by the physician will disappear in the course of analysis . . . and be replaced by something more correct."[6] The words of the physician must correspond exactly to what lies buried in the patient's unconscious. The patient is cured when he finds in himself what the physician has proposed. Only the literal truth has any effect, and a cure is a vindication of that truth.

But since when have people been so moved by an exclusive use of the literal truth? Must not the story of herself that Freud gives Dora contain the seeds, at least, of an encouragement to be different from what she was? Let us examine the therapeutic advantage of Freud's vision of Dora, from this viewpoint.

I think Freud's account and his approach can help Dora in several ways: first, it makes clear to her that something was at stake, that she did, like an idiot, give up a great deal, with little recompense. Second, it gives her a story of herself, which, although not flattering or precise, still does picture her as a grown woman, with lusts and loves and even pregnancies. It gets her thinking of the person she could be, as if she already was that way. Thus, there is an element of encouragement. Third, it portrays Dora as having precipitously fled from the possibilities of womanhood, into shameful and childish phantasies. So there is an element of reproach as well. Fourth, it gives her the example in Freud's own speech, of honesty and candour, not as an explicit teaching, but as something to be absorbed, as it were, through the skin. Facing the forbidden topic sexuality is important in itself, but important in this regard as well. We conclude that psychoanalysis can help Dora even if as descriptive truth it is partial or even distorted.

Nevertheless, we can't help thinking that a therapy based on a limited view of human nature, must, in the long run, prove itself limited. If it is possible to generalize from Dora, and claim that every neurosis involves an evasion or a distortion of the human power of speech, then any complete therapy, if such there be, must take this into account.

Psychoanalysis is, as it were, the laying on of words. But human speech is more that that. Speech must be two-sided. If an important part of the patient's neurosis is the retreat from the unpredictable two-sidedness of speech, then should not such speech play an important part in psychotherapy?

Freud himself raises the question whether it would have been beneficial for him to have bestowed on Dora the affection, the "warm personal interest", she so much needed. To do so, he says, would have been deceitful. Freud implies he felt no affection for the girl. We must wonder: did he feel *no* affection for the girl?

In his desire to be scientific, to be objective, Freud places a severe hindrance on the very therapeutic enterprise that he inaugurated. By avoiding the human communion, which speech affords, the analyst himself becomes less than candid, his theory less than sound, and every psychoanalysis no more than a fragment.

Epilogue

Some 15 months after the end of treatment, Dora paid Freud a visit. She said that after leaving treatment, she'd been "all in a muddle", then her attacks had grown less, and her spirits had risen. One of the K's two children had died in May and Dora took the opportunity to visit them. Freud says: "She made it up with them, she took her revenge on them, and she brought her own business to a satisfactory conclusion. To the wife, she said, 'I know you are having an affair with my father', and the other did not deny it. From the husband she drew an admission of the scene by the lake which he had disputed, and brought the news of her vindication home to her father. Since then she had not resumed relations with the family."

To us, Dora's *outspoken* revenge marks her as half cured. The callousness and passivity of her timing make clear it is at best half a cure.

To Freud's surprise, Dora tells him that in October she'd had another attack of her aphonia, which lasted six weeks. He asks her what might have excited it. Dora is evasive. "She had seen someone run over by a cart. Finally she came out with the fact that the accident had occurred to no less a person than Herr K himself. She had come across him in the street one day . . . he had stopped in front of her as though in bewilderment, and in his abstraction he had allowed himself to be knocked down by a cart. She had been able to convince herself, however, that he escaped without serious injury. She still felt some slight emotion if she heard anyone speak of her father's affair with Frau K, but otherwise she had no further concern in the matter. She was absorbed in her work, and had no thoughts of marrying."

There, pretty much, is the story of Dora. Freud let quite some time elapse, before handing it over to his publisher, a fact which allows him, and us, the following ending:

"Years have again gone by since her visit. In the . . . meantime the girl has married, and indeed—unless all the signs mislead me—she has married the young man who came into her associations at the beginning of the analysis of the second dream. Just as the first dream represented her turning away from life into disease—so the second dream announced that she was about to tear herself free from her father and had been reclaimed once more by the realities of life."

All works cited below are by Sigmund Freud.

Quotations which are not annotated are from the *Fragment*. (May be found in *Dora: An Analysis of a Case of Hysteria*. [New York: Macmillan, Collier Books, 1974], or in *The Standard Edition of the Complete Works of Sigmund Freud* [London: Hogarth Press, 1962], [hereafter cited as *Std. Edn.*], vol. VII).

1. *The Origins of Psychoanalysis: Letters, Drafts, and Notes to Wilhelm Fliess (1887-1902)* (Garden City, N.Y.: Doubleday and Co., Inc., Doubleday Anchor Books, 1957), Letter 140, p. 327. See also letters 139 and 141.
2. "Some Character Types Met With in Psychoanalytic Work (1919)", *Character and Culture* (New York: Macmillan, Collier Books, 1974), p. 157; *or Std. Edn.*, vol. XIV, p. 311. One should not be misled by the conclusion of this paragraph to think that character in the ordinary sense becomes of primary interest. For Freud, "character" is a perpetual, occasionally benign, set of symptomatic traits; that is, it is the superficial reflection of something deep, instinctual, and past. The rest of this essay, as well as the fundamental essay, "Character and Anal Eroticism," bears this out.
3. See *A General Introduction to Psychoanalysis* (New York: Simon and Schuster, Pocket Books, 1972) Chapter 23, pp. 366-367; *or Std. Edn*, vol. XVI, p. 358. Also see Pocket Books edition, Chapter 28, pp. 464-465, or *Std. Edn.*, vol. XVI, pp. 456-457.
4. " 'Civilized' Sexual Morality and Modern Nervousness," *Sexuality and the Psychology of Love* (New York: Macmillan, Collier Books, 1974), p. 24; *or Std. Edn.*, vol. IX, p. 185. Why is the question (of what is peculiarly "modern" about nervousness) no longer much raised?
5. See *The Interpretation of Dreams* (New York: Avon Books, 1965), Chapter VII, pp. 613, 656; *or Std. Edn.*, vol. V, pp. 574, 617. See also "The Unconscious," *General Psychological Theory* (New York: Macmillan, Collier Books, 1963), Section 7, pp. 142 seq.; *or Std. Edn.*, vol. XIV, pp. 196 seq.
6. *General Introduction*, Chapter 28, p. 260; *or Std. Edn.*, vol. XVI, p. 452.

"The Scientific Revolution Will Not Take Place"

by Thomas K. Simpson

"The Scientific Revolution will not take place." Surely this proposition, which I have taken as the title of my lecture tonight, makes a very curious claim. I have not altogether lost my senses of sight and hearing—I recognize that we are surrounded, beset by evidences that something enormous is going on, something which by common consent we call the "Scientific Revolution," or its products. I understand that we have "split the atom," that we have begun our exploration of "space," that we are, at an ever-increasing rate, raiding the Earth of its natural materials, and converting them by art into synthetic surrogates, or into a new Earth of wastes. Let me make clear: this is not a lecture in which I will attack modern science and its triumphs—I am, I attest, one of its most devoted admirers. And not only what we call "science," but that even greater rational order which we call "technology," in whose service for the most part science works—and even beyond these, that still more vast and impressive technology of corporate structure, law and finance, which energizes and directs the motions of the whole. All of this immense system of thought and action, in which "science" in the strict sense plays a relatively limited role, constitutes our modern, technical world—the world of our "Scientific Revolution." I am not unaware of it, and I do not fail to respect and admire it. We cannot move in any direction, even in thought, without sensing that it is present, that we are in some way part of it.

How, then, can I possibly assert that "The Scientific Revolution will not take place"? Let me repeat: there is no doubt that *something* has taken place, and we know that we call it the "Scientific Revolution." But we know, too, that there is something deeply, pervasively wrong with it. It has, it seems, a serious internal defect—perhaps it should be "recalled." This new world, which is so pervaded by rational technologies, is also obviously *mad*. It is hardly possible to find a kinder term: we live in a world which is insane. I realize it is not polite to call attention to such things, and these days it is hardly done—we no longer refer in public to the fact that our world is poised to blow itself to pieces—men, women, and children—on the instant, and that our most advanced and luxurious technologies are dedicated first of all to this very purpose. Our most intelligent mathematical strategies, our most intricate electronic techniques, are devised specifically to compute and implement mass death and long-term debility. Ranked beneath this master-madness is a hierarchy of destruction of the Earth and tyranny over the human race, all masked with a verbal technology of hypocrisy, of "freedom" and "peace" and "progress," which is itself perhaps the ultimate affront to reason. I have said too much, beyond the bounds of politeness, and I will not labor this point: but I take it as evident that we live in a world which, while it is pervaded by reason in a limited technological sense, is at the same time dominated by irrationality on a scale which can only be called madness.

Now this, I submit, is not the real Scientific Revolution. We have had something else, we have not had the Scientific Revolution. And I fear that we never will. So the title of this lecture is seriously intended—not, perhaps, as an absolute assertion, but as a proposition worthy of anxious attention: as a problem for serious concern.

Well, if this is not the Scientific Revolution, what would that real Scientific Revolution be? To answer this question, I suggest that we seek help, and where better than from the authors of the original Scientific Revolution themselves? Something has gone wrong. Very well, let us go back to the original designers, to the Instruction Book, and determine, if we can, where we have made our mistakes. There would be,

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of course, many worthy candidates as consultants in the case—Galileo, Descartes, Newton; some maverick might even suggest Ptolemy—but I propose to turn to Francis Bacon. In many ways, Bacon can be faulted—for not having adequately anticipated the role of formal mathematics in the new sciences, for not having contributed to scientific discovery himself, even for having been out of touch with the science of his own time, or for having made some bad judgments on topics such as Copernican astronomy. But Bacon drew up a set of plans for the Scientific Revolution with a boldness of vision and thoroughness which are unique. The very fact that Bacon did not devote his life to science *per se*, but rather to the law, to Parliament, and to affairs of state—and yet all the while kept in the forefront of his mind his own project, to introduce a new era of reason for mankind—may suggest that he would be better able than most to view the Scientific Revolution synoptically, in its social aspect, as a human proposition. That is, Bacon may have most to teach us precisely in that aspect of the Scientific Revolution about which we have most gone wrong. So, for tonight, I shall take Francis Bacon as author of the Instruction Book for the Scientific Revolution, and seek his counsel about our errors.

Bacon wrote a very great deal, the largest part of it about "science" in the broad sense in which he took the term. In part, the complexity of his writings—overlapping, unfinished, attacking the same topics by way of a variety of literary forms and disguises—has to do with the delicacy of the rhetorical problem which he faced. He, too, thought he faced a world gone mad—seized, he said, with a kind of frenzy he called *idolatry*—and he hoped, as a practical proposition, to persuade the world that it was indeed in such a condition, and that it should undertake on a large scale a course of radical therapy. Conversation with a madman about his problem is always touchy. But what made Bacon's problem unusually difficult was the fact that he was addressing these suggestions to his employer, the King of England—Bacon was Lord Chancellor, a kind of Henry Kissinger, to King James, and he was intent on persuading James of the urgency of funding a variety of projects of deep reform. Therefore he tended to disguise his purposes and adjust his methods in the manner of practical politics.

He finally drew together, however, his program under one great heading, as the *Magna Instauratio*—the *Great Instauration*, the "great restoration," or "renewal". By this he meant the restoration to mankind of an original governance of the Creation—or the restoration of the Kingdom of Man. The *Great Instauration* required many parts, of which Bacon could not have hoped to complete more than a few in his own lifetime. In fact, what we have consists primarily of the first two parts, the *Advancement of Learning* (put into the common tongue, Latin, and enlarged, as *de Augmentiis Scientiarum*, "On the Increase of the Sciences"), and the *Novum Organum*, which is the text I believe currently on the list of Great Books. These are the two works, the first, completed works of the *Great Instauration*, which I will have primarily in view tonight, though some others lurk in the background.

The Baconian Account of the "Scientific Revolution": The New Organon and The Old

Bacon, as we see, did not call his project the "Scientific Revolution," but rather the "Great Restoration," or "Great Renewal." Why Bacon thought of his project as a "renewal," rather than a "revolution," as we do, I think we shall see. But with this interesting difference, his "instauration" is the real "revolution"—in effect, we may without injustice think of his overall work, his book of books, as if it had been entitled *The Scientific Revolution* instead of *Magna Instauratio*. In it he tells us, through stages of preparation, analysis and example, what the new era is to be, and what it is to bring to man—what, indeed, man is to *become* under the new dispensation. We should, then, be able to extract from Bacon's work, if not exactly a definition, at least a characterization of the real Scientific Revolution. Let us try.

Bacon tells us, directly enough, that he intends the "restoration of the Kingdom of Man"—but what might this mean? It appears to mean to Bacon the restoration of man's reason, at least in part, to a state of integrity it possessed before the Fall, and a corresponding return to man of his dominion over the Creation, including above all the rational direction of his own life. It means the cancellation of all the counsels of despair which have burdened him over the ages: dark advice from the ancients, in the mode of tragedy; and admonitions

from the theologians, concerning the Fall and the corruption of human powers. These counsels have, one or the other, over the ages denied man's competence to guide his own affairs, or to command his own resources or the resources of nature toward goals of his own determination. Although there seems to have been abundant evidence over the ages to support these dark views, this long era of denial Bacon tells us is to end with the advent of the Instauration. It is, surely then, a bulletin of Good News, a Gospel message; and I think indeed Bacon saw his own work—as Newton later was to see his—as a stage in the historic work of the Holy Spirit in the world, a stage on the way to the Final Days. He calls it, not an invention of his own, but a "Birth of Time."

What is this renewed, restored reason to be, and how is it to function as the basis of a liberated world? To answer this question, Bacon writes that part of the *Instauration* called the *Novum Organum*, or *New Organon*. This is the body of *logic* in the broadest sense, a theory of language, which is to answer to, and replace, an *old* "Organon," which is Aristotle's. To grasp the character of the great reversal Bacon intends, we will do well to begin by contrasting the new organon with the old.

Aristotle's *Organon* consists of a body of works, beginning with the *Categories*, going on to the work called *On Interpretation*, and extending through the so-called *Prior* and *Posterior Analytics*, the *Topics* and *Sophistical Refutations*. To these we should in principle add the *Rhetoric* and the *Poetics*, which together project the account of language and the theory of scientific argument onto the looser subject matter of human situations, on the one hand in the enthymeme of rhetorical argument, and, on the other, in the logic of plot and character in works of poetics. When this body of work, the Old Organon, is taken as a whole, we see that it constitutes a formidable bastion of the liberal arts, indeed the foundation in the arts of language of Aristotle's body of works on the sciences and the arts. And all of it, Bacon in effect claims, is based on error, and must be taken down and reconstructed from the beginning. One often hears it said that Bacon introduced a new theory of induction, called "scientific inference" or something similar, and thereby introduced the Scientific Revolution: but in fact his own view of his task was very much broader. Although induction is indeed at the center of the enterprise, as we shall see, the foundations of the new human reason are very much more extensive.

At the outset of the *Organon*, in the *Categories* and *On Interpretation*, Aristotle explains what words are and what a proposition is: we might say, he begins by teaching us how to talk. And it is exactly here that Bacon's criticism begins—Aristotle, he claims, has taught us to talk wrongly. Aristotle, according to Bacon, misunderstood what words and propositions are, and therefore his "categories," his modes of predication, are systematically misleading. In turn, his syllogisms, whose theory is developed in the *Prior Analytics*, become chains of reasoning based on invalid words and propositions, and hence arguments of mere words, words empty of meaning, and thus, finally, empty arguments. For Bacon, then, the Scientific Revolution begins at the beginning, by teaching us to talk anew—nothing less will do the trick. How can this be?

Roughly speaking, Aristotle's theory of language can be thought of in terms of μίμησις, imitation. For he tells us at the outset of *On Interpretation* that there are in the soul likenesses (ὁμοιώματα) of the things which *are* in the world (τὰ ὄντα); words, in turn, are conventional signs of those likenesses. That is, the human soul is for Aristotle in a direct and natural relation with the world: the careful, studious mind reflects the world in this mimetic mode, and in turn, the world is projected into human speech and the written word. So it comes about that in Aristotle's Organon—the Old Organon—the structure of the world is reproduced in the relations among words and propositions; the theory of language is a theory of the grammar and logic of the world itself. For Aristotle, then, learning and speaking are direct and *natural* acts. They are not necessarily easy, but they are within the compass of human virtue. One measure of this is simply in terms of scale: one man, in a lifetime devoted to study, might hope to gain mastery of all the principal arts and sciences—after all, Aristotle did!

For Bacon, this is all wrong; not because of technical errors, correctable by a new adjustment of the theory of induction. On the contrary, I think Bacon respects the integrity of the Old Organon from a technical point of view: it is a correct Organon, but for the *wrong world:* the right Organon, for the wrong world. As Bacon explains, he and Aristotle really have no argument with each other—they cannot possibly, because, strictly, they *do not speak the same language.*

The abyss between the old world, the world of the Old Organon, and the renewed world of the *Novum Organum* is so great in Bacon's view that one world can barely communicate with the other. Aristotle *would* be right about language, that is, if the world we lived in were indeed the world he describes in the *Physics*—a world of eternal forms, without past, future, or history: without beginning or end in time: an *uncreated* world, a world which does not have ruling over it a Lord God, omniscient and omnipotent, its *Creator*. Forms would then inhabit the world in the way Aristotle imagines they do, and mind would then have easy commerce with them, by nature, in the mode of μίμησις. But, Bacon says, the ways of the Lord God in the Creation are totally different from this, and man's ways of thought and speech must be correspondingly different, as well.

Creation is a mystery: Aristotle is altogether right to argue in the *Physics* that there could not have been a creation, because from the point of view of reason it is indeed unthinkable that *being* should arise out of *nothing*. The world created by the Lord God, then, incorporates the impossible; it is not an object natural and accessible to the mind, but rather divided from mind at the outset by the mystery of Creation. Those forms which God made in the first days are not the eternal forms of the *Physics*, natural objects for the mind, but themselves mysteries of the Creation, *secrets*, not impressed on the surface of nature where mind can have easy commerce with them, but embedded deep beneath the phenomena. Mind, then, cannot grasp them by mere μίμησις—the forms of cats and gold and heat are superficial, our ideas of them are correspondingly erroneous, and the words of our language, signs of these erroneous ideas drawn from superficial forms, are not the right words. To find the real forms, to learn to speak the real words about the secrets of the Creation, requires not nature but *art*, and long, strategic effort: that newly discovered art which Bacon sets forth in the *New Organon*, and which he calls "The Interpretation of Nature." In the interim, at the point of tangency of the old and the new worlds, the encounter, Bacon's rhetorical strategy is to use the old words, for we have no other common coin—but warns us to read with caution: a word like "form" in its old and new uses will not mean the same things, words will not mean even the same *kinds* of things.

Not only did Aristotle, according to Bacon, speak the wrong words; he misunderstood predication. Aristotle teaches us in the *Categories* to say of a certain white object, not simply "This body is white," but more strictly, "Whiteness is in the body," or still more strictly yet, "A particular whiteness is in the body" (τὶ λευκὸν ἐν τῷ σώματι ἐστί). One thinks of whiteness as a form, a quality, which has come to be in this particular body, this stone. The crucial notion in predication is being: the stone *is* white, or whiteness *is* in the stone. Even in the triumphant formulation of motion in the *Physics*, Aristotle understands motion as occurring between two states of *being*, actual and potential—thus if the stone is bleached or painted, it is first potentially and then actually white. Between the states of potential and actual whiteness, the motion of becoming white is something of a blur.

For Bacon, this again requires radical correction: predication is not fundamentally of being, but of action or operation. "Form," he says, means *law* or pure *act*. *Law* ordains the *act;* so, for example, where there is heat, that law which is the form of heat is present, and so is the act which the law ordains. If we heat our white stone, it is not that something—hotness—comes to be there, but that something comes to happen there. Heat will not be something *in* the stone, but something *going on* in the stone. Whiteness, or heat, will be something *going on*.

Let us look at one specific example of predication from the *New Organon*, to see what it will mean to predicate law rather than Aristotelian form. This example happens to be a negative proposition concerning heat, one of the initial findings of a sample "interpretation of nature" Bacon offers as a paradigm of the new method, namely a search for the form of heat. The investigation has shown that, although in some cases such as that of air, a substance when heated becomes rarefied, this is not universally the case, and so the following negative predication is to be made:

"Rarety does not belong to the form of heat."

This sounds innocent enough as a propositional form, but that is because it has not yet been recast into the appropriate mode of predication. The real predication will express law and action. Transposed into the predicates appropriate to the *New Organon*, which is to say, appropriate to God's Creation, we get the following pair of expanded propositions:

"It is possible for man to superinduce heat in a dense body."

and

"It is possible for man to reduce or prevent heat in a rarefied body."

The first, short form was merely a mode of predication borrowed from another world. The expanded form, the true mode of predication for the new world, is *operational*: it tells us what *works* the law of heat permits us, or does not permit us, to do. The true meaning of "form" is just such a law of operation. The Creation is ordered, not by static forms which are objects of contemplation, but by fixed laws ordaining *action*. These, too, are intellectual objects—but objects of a faculty which is itself new, despite its old name: *intellect* primarily ordered to works, not to thoughts—or better, to thoughts which are works.

Bacon intends no deprecation of intellect here. It is crucial for him that the first work of the Creation was Light—but that Light is the beginning of a sequence of Works. In turn, he sees the Sabbath of the Creation as contemplative, but that contemplation is a contemplation of works completed and good. Bacon's understanding of form and intellect might be seen as a counterpart to other theories of forms: and the Creation story, as Bacon interprets it, as a surrogate for the Platonic myth of recollection. That is, Plato and Bacon deeply agree that truth exists and is accessible to man—that learning is possible. They agree, too, that this means that forms exist, and are the objects of our intellectual search. But the new forms are not *within* us, or to be sought by a dialectical examination conducted in private, as an inquiry into the content of our own souls. They are within the Creation, but *external* to us, and the possibility of learning is assured—Meno's question, which Bacon asks himself, is answered—by the possibility of conducting a dialogue with Nature. Our "forgetting," our Lethe, was the Fall, in which, in the vanity of false philosophy based on a false understanding of the nature of knowledge, man turned away from God's Creation and thereby lost the power to seek true forms. But that power remains latent within us, and can be restored by an act of free will, an act of deep humility, in which the vanity of the philosophers is rejected, and man turns instead to a long, patient dialectic with Nature. This is the Baconian peripety, which would make man once again teachable, and this willingness to be taught by God through the Creation is for Bacon the foundation of the Scientific Revolution.

Against Plato's visions of the Forms, Bacon sets the image of the Garden. The Garden is of course an object of contemplation; but it is not simply an image of order and beauty, it is an image of Works: in which man will find, not static truths, but an intellectually luminous task. That Garden is the Creation; man's intellectual task is to know it, and thereby to govern and cultivate it, in the Kingdom of Man. Otherwise said, the Kingdom of Man is Bacon's counterpart of the Platonic Republic. Where the Republic is ordered to the forms, that is, to knowledge as the highest good, for Bacon God's forms, the *laws* of Nature, are ordered to the Kingdom of Man as the Light of the First Day is ordered to the Creation. It is as a Work that the Creation is to be grasped by intellect as luminously good.

Bacon's Inductive Logic

I have been anxious to emphasize the total reconstruction of the arts of language which Bacon undertakes, and therefore have spoken thus far about the first elements of the Organon, the word and the proposition. It remains true, however, that the central issue is "induction"—for it must be by a reformed mode of induction that the new secret words and operational predications are to be found out. We should consider first what we may mean by "induction" in general, and then very briefly compare the accounts of induction in the Old and the New Organons.

Our Latin word "in-duction" means a leading-in; Aristotle's terms, *ἀν-αγωγή* or *ἐπ-αγωγή*, suggest leading-up to a goal, and of course the Platonic imagery is of an upward ascent. Whether we figure the process as moving inward or moving upward, it is in any case the primary phase of the learning process. Induction is the mode by which we move from initial confusion to clarity, from the obscurity of common opinion or sense perception to the light of first principles—or, as Aristotle says, from what is most knowable to us, to what is most knowable by nature: i.e., from what appears to be clearest, to what really is clearest to the mind. This is of course not the only kind of learning that we do:

when we learn from Euclid, we are, in the first instance at least, moving the "other way"—taking the first principles as known, and deriving a long series of consequences from them. This is "de-duction," the motion "downward". Aristotle calls this second operation of reason ἀπό-δειξις, or in Latin *de-monstration, showing* the consequences which follow *from* the first principles, which are either best known, as in true scientific argument yielding ἐπιστήμη, or are granted by the learner for the sake of the argument, as sometimes has to happen at the outset of our study of Euclid, in relation to the definitions of "straight line" and "point."

Now this second phase of reasoning can, in some sense, be carried out by that *method* which Aristotle teaches in the Old Organon, calling it συλ-λογισμός, syllogism, the art of weaving propositions together into a binding demonstrative chain. If you have ever tried to apply Aristotle's theory of syllogism to Euclid's text, I think you will have discovered something that Aristotle, or the fate of his texts, has omitted—namely, the theory of the relational syllogism, συλλογισμός in the case in which the predications are of relation, πρός τι; all that seems clear about this is that Aristotle did not really intend to omit it. But with all this theory of deduction, Bacon has no serious complaint. The issue between Bacon and Aristotle or Plato is over *induction*—but since this is the original, generative motion of the human mind, it is really reason itself which is at issue. Bacon claims that Aristotle and Plato are wrong about the very nature of human reason, in being wrong about induction.

With this understanding of the significance of the question of induction in general, we can turn now to Aristotle for his own account of the inductive process. I take the following passage from the close of the *Posterior Analytics*, Aristotle's book about science; although it is likely to be familiar to most of you, I am going to quote it at some length because it epitomizes that concept of a natural process of induction which Bacon feels is a fundamental and ruinous error:

> Thus from sense-perception (αἴσθησις) arises memory . . . and from repeated memory of the same thing arises experience (ἐμπειρία); for memories which are many in number are one in experience. From experience, or the coming to rest of the universe (τὸ καθόλον) out of the many in the soul—of the one out of the many, the one which is the same in them all—arises the first principle (ἀρχή) of art or of science. . . .
>
> Thus these powers (ἕξεις) . . . arise from sense-perception, just as, when a retreat has occurred in a battle, if one man halts so does another, and then another, until the original position is restored. The soul is so constituted that it is capable of having this happen to it. . . . It is clear then that for us the first things (τὰ πρῶτα) are known by means of induction (ἐπαγωγή).

Now, we certainly do the sort of thing Aristotle describes here, all the time—the process is altogether familiar. But according to Bacon, what results is not at all the true first principles, τὰ πρῶτα, but only popular wisdom, an account of the mere surface appearance of things—what both Bacon and Newton call *vulgar*, i.e., common, impressions, as opposed to truth. Experience does not in this way present us with the true universal; it is not present in that first "halt" in the soul. The soul is not "so constituted," as Aristotle claims, that it can in any such natural way arrive at serious truths. When Aristotle goes on to say here that "it must be intuition (νοῦς) that apprehends the first principles" he is, for Bacon, sealing his error. Unaided νοῦς, in its natural, spontaneous operation, merely assembles our perception of the surface of things: to take this for truth, and the objects of νοῦς thus arrived at as the true πρῶτα, first things, is to substitute the surface for the underlying reality of the Creation—to substitute a merely human concept of truth for the Divine. For Bacon, this imposition of an opaque screen between man and God is the real temptation by which Satan, through the offer of an illusory "truth," led man to sin and the loss of Paradise. Aristotle, and mankind in his train, are not simply in philosophical error; this substitution of vain νοῦς for Divine truth is idolatry and sin. Thus we see the momentous significance, for Bacon, of a correction of the theory of induction.

The way to the new understanding of Reason and Truth, then, is through a total repudiation of intellectual intuition in its natural operation. Only after such a cleansing repudiation will we be ready to turn our minds toward the immense task

Bacon now lays before us—the New Induction, the Interpretation of Nature.

The New Induction is a great construction, an *art*, and for guidance in its design Bacon calls upon various existing arts as sources of suggestion. Since the universe has become for Bacon a cryptic text, full of truth, but requiring penetrating analysis, the *art of interpretation*, a branch of the art of rhetoric which flourished out of the need to unveil Scriptural secrets—a kind of inverse, or mirror-image of the art of speaking—becomes the overall paradigm for the New Induction. On the other hand, since the problem is that of coming upon hidden things, or discovery of secret axioms and true arguments, Bacon looks as well to another branch of the art of rhetoric—that aspect which was traditionally regarded as the highest and most esoteric mystery—the art of discovery, coming-upon, or, in Latin, *in-venting* truths or lines of argument. Aristotle dealt with this as part of the Organon, in the *Topics*, τόποι, literally "places." This is a collection of loci of argument in all areas of thought, collected to facilitate invention of new lines of logical attack. Bacon is of course not interested in such stale collections, but the notion of tabulating places or instances as powerful resources for invention is taken over from the *Topics* in a massive way as a fundamental method of the New Organon. If we think of the Creation as a cryptic text requiring interpretation, Bacon's tabulated instances become organized collections of crucial passages in the text, and at the same time, tables of phenomena, or natural histories, arranged so as to be in the most powerful way spurs to the discovery, invention, of hidden things. We thus see Aristotle's *Topics* transformed into tables of scientific phenomena and data, clues to the discovery of hidden scientific laws.

A third model for this new art of induction is suggested by the fact that the object of search is *law*—and is no doubt also suggested to Bacon by his own principal training and experience as a lawyer. Since the search is for law, the problem is not unlike that which regularly faces a judge, and which was a particular preoccupation of English common law. Where the law is indefinite, or where it is a law of custom and precedent rather than positive legislation, it may fall to the judge to *determine the law*, by the analysis either of disparate written formulations, or from precedents. When this is the problem, documents and precedents will be arrayed before the judge, perhaps in opposing tabulations by opposing attorneys, and the judge's task becomes that of determining the one consistent interpretation of the underlying law, supposed to obtain in all the instances.

This legal procedure is on the one hand a problem in interpretation, and on the other a problem of discovery and an application of the rhetoric of invention, so that these three methodological paradigms converge in the New Organon. The legal model is in fact perhaps the most prominent: Bacon sees scientific method primarily as a problem in the law. We might add that one of his own greatest interests was in the rational reformulation of English common law, the transformation of Common Law into a written, rational code: Bacon was, at least strategically, a Royalist, and in matters of law, a Roman. For him, English Common Law was one of the urgent and exasperating instances of an alchemy in need of reformation by the New Organon.

The actual implementation of the new logic is extensive and complex, and need not detain us here. The Creation is to be searched for the widest possible spectrum of instances in all fields of learning, which will then be channeled by vast efforts of imagination into Tables of all sorts, for presentation to reason for judgment; each judgment will suggest new works, which will on the one hand be fruits of the new method, for the use of mankind, and on the other, will put tentative judgments to the test. Because Nature's secrets are so deeply hidden, works will often take the form of experiments, in which by art Nature is forced out of her normal channels, to yield revelations which would never otherwise come to light. In all of this, we recognize the roots of the enormous, brilliant system of research and publication which is the working structure of modern science; the system which Bacon summarized as "Literate Experience." It may be criticized, but not because its results are not interesting—they are interesting, and of the greatest importance: the question is not of their value or importance, but of what we do with them.

Avoiding any discussion of the details of Bacon's method, let us try briefly to draw up a first characterization of new human intellect which emerges from the New Organon.

First, we see intellect conceived as *judge*, and hence the subsuming principle of judgment on the strength of valid *evidence*. Where the object of intellect, truth, is embedded in the Creation, external evidence is the lifeline of intellect, the

essential clue leading to its goal. Hence every effort will be bent toward gathering, arranging and reading those signs. *Second*, since mind no longer moves in the ancient circle, but advances constantly to new discoveries, new intellectual worlds, then foresight, anticipation, and inventive imagination will support intellect in its process of learning. Probing new depths and reaches of the Creation, the intellect will itself, in the shock of its discoveries, seem creative—science will move closer to poetic, the intellectual object will be new to history, and in turn, it will no longer seem inappropriate to speak of the poetic artist as "creative." For Bacon, the dominant symbol of the Great Instauration is the discovery of the New World—which is both an "emblem," as he says, of the new endeavor of the human intellect, and a sign in history that he lives at a time which is giving rise to new births. *Third*, the new intellect will combine humility on the individual level—for no one thinker can carry the work of mind forward far alone, where the scale of the endeavor is so vast and the ultimate goal so remote—with new courage and hope on the level of mankind as a whole. The new intellect will be social, and the individual will draw upon this and contribute to it in an inquiry which is essentially a rational dialogue on the part of mankind as a whole. *Fourth*, perhaps as a corollary to mind's new social context, progress will often occur through negation. The denial of the partial and erroneous insights of any one mind in any one time, by the larger findings of mankind over the generations, will not mean a chaos of wasted efforts and abandoned ideas, but a dialectical progress of mind to which any one individual, however heroic, can do no more than contribute. This conviction of the overall positive rôle of a limited or negative result, the understanding that refutation is the way, not to despair, but to deeper insight—the dialectical principle—Bacon rightly sees as his fundamental debt to Plato. The passage through negation must be sustained by deep conviction—for Plato, belief in the possibility of knowledge of the forms, through recollection; for Bacon, faith in God's truth, impressed upon the Creation, and attainable through the new method of Interpretation of Nature. *Finally*, the new intellect learns through experiment, and contemplates its results in the mode of Works. As mind's grasp of the axioms of nature deepens, their operational form yields growing power over nature: this power to command Nature, to rework the Creation by art, to recreate, Bacon calls metaphysics, or "magic." The new intellect, then, unites a contemplative side, in which it is metaphysician, and an operative side, in which it is magician. The fusion of the two reflects the new concept of created forms.

The Scope of the Scientific Revolution

To what extent is this new intellect a counterpart of *νοῦς*? We have seen the enigmatic union of contemplation with operation, and the new paradigm of judgment by art on the basis of external evidence, rather than learning by nature through inner recollection. Truth is attainable, knowledge is possible, but Bacon's *intellectus* is surely not quite the same as *νοῦς*. Let me add now another consideration, through which *intellectus* and *νοῦς* may seem after all to move a little closer together. I think in so doing I will take us closer to the focus of our initial concern with the threatening version of the Scientific Revolution which now surrounds us.

Recall the difficulty Socrates describes concerning his early enounter with Anaxagoras—or rather, with the book Anaxagoras had written, entitled Νοῦς. Socrates had begun with the human question "Why?", and had seized upon Anaxagoras' work because he thought a book entitled Νοῦς ought to deal with his question. In fact, he found that it answered the question "Why?" in all the senses except the interesting one, "To what end?"—that is, Anaxagoras had failed entirely in the real enterprise of intellect as Socrates understands it, because he omitted consideration of the *good*. Now, our modern science is generally understood, and generally understands itself, to be Anaxagoran in this sense: it is "objective," it says, or purged of what it calls "value judgments," and hence, it, too, omits consideration of the good. Insofar as it rises above mere skepticism to speak about truth at all, it believes it can deal with *truth* precisely to the extent that as it does not deal with the *good*. Hence our image of what we call modern science: austere, sterile, morally neutral—all those characteristics symbolized by the white laboratory coat—which, when coupled with the Baconian magic it obviously does command, breed terror in the hearts of mortal men.

Now, is the Baconian *intellectus* morally neutral in this way? Is the Great Instauration indifferent to human value and

purpose, in the way we ascribe to our supposed Scientific Revolution? The answer is decisively, "No."

Perhaps a shudder of apprehension will greet his report: the only thing more terrifying than a science which is morally indifferent, might seem a science which presumed to pronounce on moral issues. But I think it is already clear that Bacon does not mean by intellect and its object what we refer to as "science" and the "scientific object": though he typically uses the term *scientia*, science, he intends it, it seems, in a way after all much closer to its ancient meaning. Let us see how Bacon deals with the relation of the new science to the human good.

You might expect Bacon to say that we have two texts before us: the Creation on the one hand, and Holy Scripture on the other—and that, although we turn to the first for intellectual knowledge of the laws of Nature, we must turn exclusively to the second for guidance in human action. On the whole, our western world has taken this path, confining what we call "science" to so-called "objective" questions, and seeking moral light by other means. But that is not the answer Bacon gives. He turns again to the account of Creation, his Myth of Recollection, as paradigm. The Lord God carried out the Creation, which in this context means for Bacon that God impressed upon Nature forms in the mode of laws—and with each day's work, pronounced that it was "good." The Sabbath is the contemplation of a whole work which is very good; and the Garden is a vision of an order which is at once intellectually luminous, and good. That is, for Bacon there is no doubt of a deep and total union of the intellectual and the moral object: of the True and the Good. This faith in the goodness of the Creation reflects Bacon's faith in the goodness and power of God. Allowing for an infinite difference between worlds with and without God, we might nonetheless say that this faith of Bacon's is a counterpart to the Platonic belief that the intellectual object is illuminated by the Good—that νοῦς in answering the question "Why?" does so ultimately in terms of what is best. For Aristotle, this same conviction of the union of the intellectual and the moral object is reflected in the priority of the Final Cause over other causes in the account of the cosmos.

Bacon is thus able to assert that the New Organon is inclusive. It does not merely define our intellectual relation to a limited class of natural objects, called "scientific"—but extends to all intellectual objects. The entire Intellectual Globe, as Bacon calls it, is the object of the new *scientia*. This will, then, include for example ethics, politics, law, history, and economics. Though in some of these areas we can more safely borrow from the old learning than in others, in principle all are equally concerns of the new science. "Science" properly deals with all aspects of human thought and action. We begin to see that Bacon understands the Instauration to be coextensive with the body of Aristotelian learning: founded on a New Organon which defines the new human speech and reasons as totally as Aristotle's did the old, Bacon now proposes to construct counterparts to all the Aristotelian arts and sciences. This is the scope of the real Scientific Revolution, of which we can now see our so-called "Scientific Revolution" must be only a small and relatively minor part.

To go directly, then, to the crux of the matter: how does Bacon understand the new science to deal with the human good? How does *value*, the weighing of human purpose, enter the forum of scientific evidence and rational judgment?

Bacon's answer is very simple in principle: we look at the evidence of human goals, human *appetitus*, "appetites," and inquire with the same rational care as in other investigations, what it is which human beings by nature want. Just as he sees other natural forms lying deep beneath the surface of things, he believes that we have yet to inquire deeply into our own nature. He suggests that when we do, we will find three levels of human intention: individual appetites; social goals at the level of political loyalties, the proximate community; and finally, deepest and truest though not yet popularly recognized, what he calls *philanthropia*, the projection into human nature of the Christian virtue of charity, a love of mankind as a whole, or of man as human. It is this *philanthropia*, he senses, which has moved him throughout a long legal and political career to bend all efforts towards defining and instituting the Instauration. In short, Bacon has profound faith in human nature, reflecting his faith in God: faith that we can safely ground the ethics of the Kingdom of Man on a candid effort to know human nature better, and to achieve our natural human goals—not natural appetite as vulgarly conceived, but human desire as truly and deeply known.

To avoid misunderstanding, let me add without delay that Bacon was anything but naïve about human "nature" as commonly encountered: in his political function as Lord

Chancellor, he moved in a realm of constant deception, strategy, villainy, and treachery; his brother, with whom he had close relations, had been Queen Elizabeth's CIA man in France for many years. But Bacon had also perceived the possibility that man's nature, *restored* to itself, and above all, to *faith* in itself, in an era of a new use of reason, could indeed make a Garden of the Earth. Man need be no more helpless in relation to himself than he will be in relation to other parts of the Creation. Man's nature, once better understood, can be liberated from the alchemy of social accident and superstition, and can then find its way to a society more consonant with its own deeply felt aims. This reasoning together toward common human goals is the highest work Bacon intends for the New Organon, and the Great Instauration—this highest function, we might say, defines for him the new era. And it seems that it is precisely this which we have omitted from our abortive "Scientific Revolution." We reason massively and precisely about everything except our goals, or rational means for achieving them. We have embraced the Scientific Revolution in its easier and minor aspect, that part which omits man's purpose; and have systematically eliminated from the scope of reason, ourselves, and what we most care about.

The Measure of our Relation to the Scientific Revolution

Let us now review certain bench-marks of the true Scientific Revolution, by which we may appraise more carefully our distance from it.

(1) The true Scientific Revolution is neither an exercise in empiricism, nor in skepticism. Though it moves by way of evidence, it follows a road toward truth. It finds laws of nature which are true, and the power which they convey is not the power of the empirics, as Bacon calls them, who move by analogy from work to work, but of intellect, which has grasped a universal object.

Thus the Instauration does not set us on that skeptical path through Hume and Kant; if the modern world has indeed taken that route, it is not from following Bacon, or, we may add, Bacon's disciple, Newton.

(2) The true Scientific Revolution is not materialist, nor does it look to either mathematics or mechanism as paradigm for the forms of nature. Insofar as we understand "laws of nature" as "binding" mathematical equations or mechanisms, we have followed Descartes, not Bacon, or, again, Newton. Bacon sees mathematics as important, but in the rôle of appendix to the real enterprise, on the simple principle that the Creation contains a rich variety of things, and it is primarily important to know them directly, and distinguish them, before measuring them, and reducing them to undifferentiated magnitude. Our algebraic reduction of all things and all human acts to number, whether in the laboratory by way of rulers and balances, or in the market place by way of exchange of all things and our very selves as commodities, owes nothing to Bacon.

What is at issue, and becomes the crux of our misunderstanding of Bacon and of our frustration with our own scientific era, is the concept of "law." We tend to think of scientific law as an iron bond, a restraint on freedom: and indeed, in self-fulfillment of our prophecy, our science becomes just that. But "law" does not mean that in principle, and it does not mean that to Bacon. He is a student of the classics, of Scripture and of English law, not a mathematician or a machinist. What does Bacon mean, then, when he asserts that the *forms* will be *laws?* He means that they are intelligible rules of action, meaningful and significant elements of an organic whole. The better we grasp them, the better we will grasp their significance as well. His image of Nature governed by law is not that of a machine-shop or a computer, but of a Garden. Laws of Nature, then, are not blind connections, like links within a machine, but ways of acting, like the ways of flowers which the gardener comes to know, and to love.

If we moderns respond to Bacon by reporting to him that he was unfortunately mistaken in this, and that we have found that the laws of nature are indeed strictly mathematical, Bacon might be puzzled, but Newton would offer an answer. He tells us in the *Principia* that we are in danger of misunderstanding mathematics—that we have failed to see that mathematics itself can bear intelligibility, and be meaningful and not blind. The same book that taught us how mathematics rules nature, teaches also that this mathematics can be the subject of as luminous interpretation as any other text. Unfortunately, we have understood the first message of the *Principia*, but not the second.

When I say that the Instauration does not propose a materialism, I mean not only that its laws are those of a Garden

and not of a machine, but that Bacon has no notion of reduction of the Creation to the motions of matter. We should not forget that the laws of human nature are at the very center of his concern, not as bonds upon us, but as a rational grasp of our rôle in the Creation, as Gardener. Gardeners who know what they are doing can be very creative; they are not in bondage to their work.

(3) The true Scientific Revolution is at its very center a social enterprise. With the depths and expanse of an unexplored Creation as the object of inquiry, man can only learn in the company of all mankind. And since learning immediately and continuously weaves with action, we will act, as well, in the company of mankind and in relation to history. In this, we moderns are in one sense close to Bacon. We understand and practice this new art of reasoning and acting in common, on what is rapidly becoming genuinely a world scale: our vehicle for this is our *de facto* world community of scientists, technologists, and businessmen, ordered by the social structure of a network of international agencies and corporations which they serve. Our position seems to be, then, that the limited rationality of our science and technologies is rapidly forging this community of mankind *de facto*, on a correspondingly limited basis, without our having understood or endorsed what we are doing. We retain a mythology of society which is pathologically out of touch with its reality, a disparity which leaves society effectively unguided.

I think it is clear that between our world and Bacon's vision, the distance is very great.

With these observations to guide us, let us now, as well as we can, take the measure of our present distance from the real Scientific Revolution, as Bacon envisioned it. That real revolution, the Instauration, was to have been founded on a renewal of man's faith in himself as a rational being, and in the power of a new form of dialectic to seek truth in broad areas of human concern, including, above all, man himself, his goals on this earth, and the forms of social institution best adapted to achieve these aims. It was to take the form of a free and open dialogue on the part, ultimately, of all mankind—a dialogue not at all unlike that which our scientists presently conduct world-wide, based upon evidence and the critical, logical examination of positions and proposals. But the Baconian dialectic would draw not only upon evidence from nature and the laboratory, but would draw as well upon careful study of our history, our institutions, and in general, the vicissitudes of our common human experience. It would yield a continuous series of works, which would at the same time be the vehicles of the new dialectic, and fruits leading to a better life for man on earth—works which would include not only new substances and new powers, but new forms of government, of production, and of human relationship.

Can we put our finger on the crux of our difference from this Baconian invitation? I suggest that it lies in the lack of that faith which lay at the foundation of his enterprise. We are—highly prematurely, I believe—disillusioned about any relation between science and "truth," and we do not dare subject our human aims and institutions to the free rational study which we bring to bear on atoms or on animals. We fear science as mathematical, mechanical, sterile, and threatening to the human spirit. As a result, we hide our thoughts concerning such matters as politics and economics under veils of superstition and illusion, we persecute those who bring these beliefs under serious critical attack, and we insulate the discussion of them as nearly as possible along rigid national or cultural boundary lines. All this, I suggest, reflects lack of faith—in humanity, and in the possibilities of far-reaching rational discussion of our common human situation.

Will the Scientific Revolution Take Place?

Not everyone will be persuaded by Francis Bacon, or by me, that the Great Instauration—the real Scientific Revolution—would be desirable, or even preferable to the abortive "Scientific Revolution" we are now having. I for one would be very much interested in a change of Revolutions before it is too late. But what are the chances that the real Scientific Revolution might after all take place?

It appears to me that the chances are very slight—that the auspices for a broader and deeper reign of human reason, or for the free and rational government of our human affairs, are highly unfavorable. I will not try at this point to analyze the present situation even briefly, although it is interesting to note in passing that this problem, too, falls within the compass of investigation by the new method, and that Bacon devoted a great deal of his own effort to the analysis of the prospects for

the Great Instauration in his own time. He thought then that the prospects were pretty good—a prognosis which, as it turns out, is perhaps not a very good advertisement for the prophetic powers of the new method!

Bacon diagnoses the obstacles to the Great Instauration—that is, to a free application of human reason to human affairs—in terms of a theory of idolatry. Idols for Bacon are all those factors which together block the motion of reason. Without considering his theory at this point, let me simply mention the one great obstacle which I think today decisively stands in the way of human freedom. This is, very simply, the effect of our abortive Scientific Revolution on the power of thought itself. Thought has become the principal victim of the technology it has devised. Virtually every medium for the conduct or dissemination of thought—every forum—is itself enmeshed in a hierarchy of technologies—technologies, that is, of *our* barren kind which seal themselves off from evaluation and re-direction with respect to the human good. I do not mean only what are called the "media"—television, publishing, the press with its special technology of the wire service and the press release, or advertising, with its subdivision called education: but as a cumulative consequence of all this, our very language, our concepts, the questions we ask and the principles we reach for in attempting to answer them—the very structure of our language and our thought itself become impenetrable to criticism, and hence to rational understanding of change. Bacon thought he faced just such a problem in confronting the closed system of Aristotelian and scholastic thought—but while it was closed, it was not *technologically* closed. Now, closure appears to be sealed by the very powers which Bacon's original invitation, so misunderstood and misapplied, has unleashed.

It is because of this technological closure that I fear we are now locked into a sterile misunderstanding of the Scientific Revolution, and that we will never be able to find the moral and intellectual purchase which would be needed to wrench ourselves free. It would be tempting to describe our situation of powerlessness as "tragic," but I fear we cannot lay claim to such depths of mystic insight; it would be fairer to say that we are simply in a very bad pickle.

If there is any hope for the real Scientific Revolution—any hope that reason will break free from this silent, faceless tyranny of technology—I think it must come from the fact that our present system, for all its complacency and appearance of totality, is in fact deeply in conflict—with itself, on the one hand; and with a certain ineradicable sense of man's purpose, on the other. Perhaps out of sheer exasperation, despair, or disgust beyond the ability of technology to neutralize or veil, mankind will succeed in turning from the present order of things to one not unlike Bacon's vision, in which reason, unbound, may after all come to guide and serve mankind.

Chaos, Gauss, and Order

by Michael Comenetz

This is a bicentennial lecture! Gauss was born in 1777. He was a very great mathematician, perhaps the foremost of all mathematicians. Archimedes and Newton may be his peers. Gauss deserves to be honored by us: he may be the greatest thinker we don't read. But it is difficult for us to approach Gauss. His work, like the man himself, is forbiddingly austere; and it comes not at the beginning of modern mathematics, but at a time when it was already well under way. Nevertheless, I'd like to try to bring one small part of his work before you tonight.

I'm going to tell you about an idea Gauss had in 1795, when he was 18, and continued to develop for some 30 years. I'll try to show how his thought evolved; and perhaps there will be something to be learned about the way mathematics is discovered. I should say that other men worked on the idea too; but I'll talk only about what Gauss did, which was quite enough for one lecture.

Gauss was concerned with the problem of drawing conclusions from astronomical observations. His ideas apply to all kinds of observations. That he was led to the problem by astronomy gives us one more indication—as if we needed more!—of the central role astronomy has played in the development of scientific thought.

Suppose that I want to determine the value of some unknown quantity, by taking observations. I will encounter two kinds of difficulties. The *first* is that I may not be able to observe directly the quantity I want to determine, but may have to observe other quantities and deduce the value of the one I want from the observations of the others. In astronomy, I can see only what is put before me. If I want to know the shape of a planetary orbit, for example, I can't directly observe its length and width, but must deduce them from observations of such things as the planet's height in the sky.

The *second* problem is that no matter how careful I am, my observations are affected by errors. Some I can compensate for: if the atmosphere bends the light of a star, I can allow for the amount of bending in my use of the observations of the height of the star. Others seem entirely beyond my grasp. My own vision is not quite uniform; the air shakes in a random way; the telescope is not quite firm on the earth. The resulting errors I consider to be *chance* errors. With care I can make them small, but I cannot eliminate them; my repeated measurements of the height of a star will vary slightly, although I assume the height to be actually constant. Given the results of such variable measurements, what conclusion can I come to as to the best value to accept?

Here is another example. According to the law of gravity, the force with which two bodies attract one another depends on the square of the distance between them; that is, on the distance to the power 2. Is that "2" quite correct? Only observation can tell me. But I can't observe an exponent! I have to observe certain physical quantities as well as I can, and deduce the value of the exponent from these observations.

Let me give one more example. Suppose I want to know the average height of a student here. To estimate it, I measure a few of you. Your heights vary! But I am somehow to use them to estimate the true average height of all of you. This example is quite different from the other two, as you may see; but the same ideas illuminate both.

I hope it is clear that this problem is one of the most fundamental importance, having to do with all our precise knowledge of the world of things. I hope it also appears as a mystery.

Now in considering this problem of observations I become aware that the observations not only vary but are afflicted by the presence of a kind of chaos. The errors occur helter-skelter. When I look at the star I have no very good idea in

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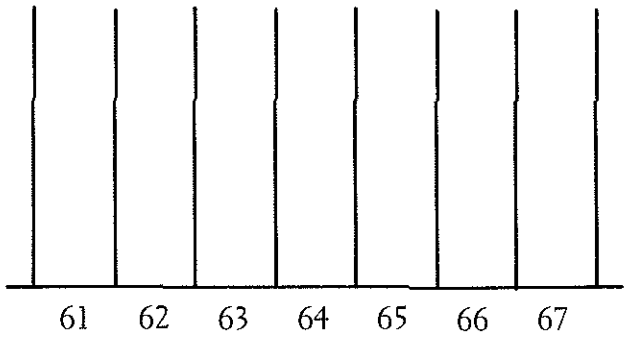
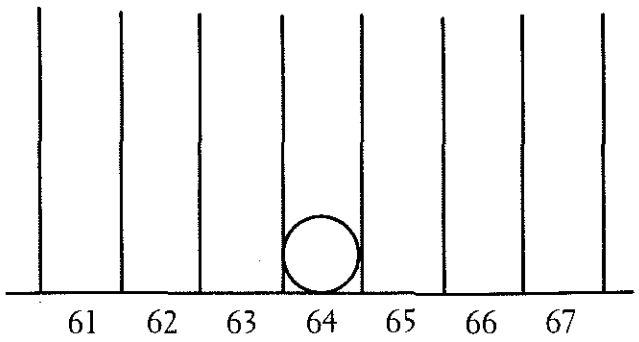
advance what height I will observe. How can I hope to comprehend this chaos in order to find what I seek?

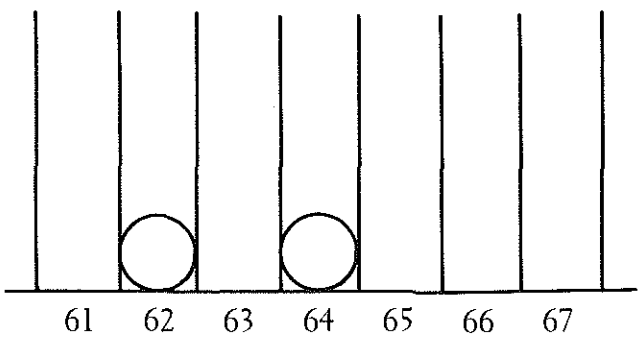
Well, I can make a beginning this way. I *classify* my observations, as follows. I make a wooden box



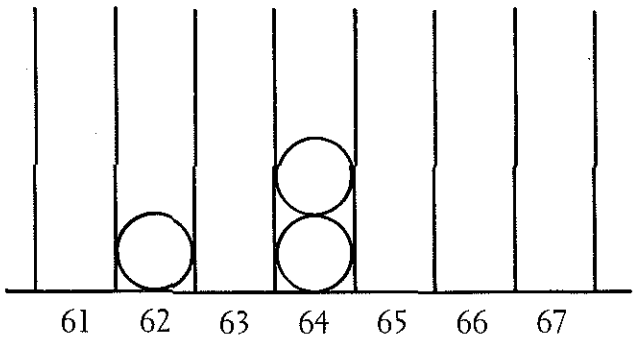
with a bottom and a back and a glass front and vertical partitions, open at the top, and I label each slot with a number—say, 61, 62, 63, 64, 65, 66, 67; these could be degrees above the horizon at which a star can be observed. Each time I take an observation I put a pebble—I have lots of pebbles, all the same size—into the slot corresponding to the measurement I made. Thus, if I look at the star and see it at 64°, I put a pebble in slot 64.



If I look again and see it at 62°, I put a pebble in slot 62.

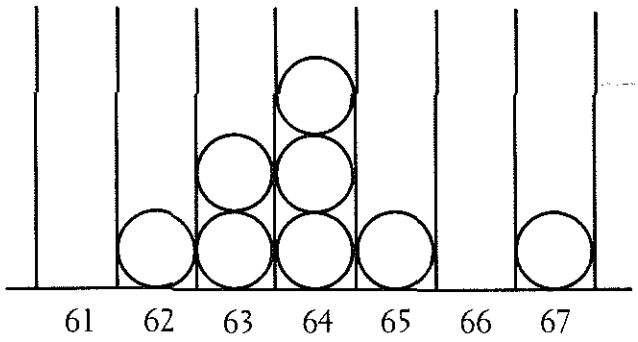


If I look once more and see it at 64° again, I put another pebble in slot 64.

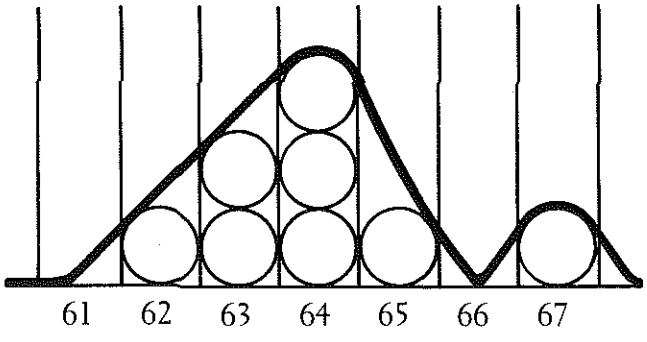


And so on.

The pebbles go in now here, now there, without rhyme or reason—in a perfect chaos. Or is it? Let me take more observations and put in more pebbles, so they start to mount up,

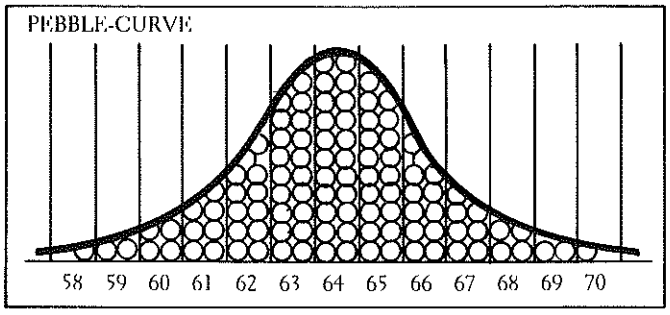


and let's look at the curve formed by the tops of the columns of pebbles.



(Actually, it will have steps; but if the slots were many and narrow, as would be the case if I were taking more precise observations, the steps would hardly be noticeable. I shall ignore the steps.) I would expect the pebbles to cluster about

the true value—say, 64—but what I find is that the curve gradually takes on a definite shape!—something like this:



Placard 1

Of course it gets bigger and bigger as I put in more pebbles; but it acquires and keeps a definite form.

This doesn't look like chaos! To say that the curve has a form is to say that each measured value has a particular likelihood—a particular frequency of occurring—relative to every other. For example, if the pebble-curve is twice as high above 64 as it is above 62, twice as many pebbles go in at 64 as at 62: 64 is twice as likely to occur. If one could never make such a statement, if the curve continually changed its shape as the pebbles went in, one would have a deeper chaos, more difficult to comprehend—to *make something of*, as here I have made this curve.

Now that experience has shown me that there is hope of comprehending my data, I can formulate two questions:

1. HOW COMBINE RESULTS OF OBSERVATIONS TO GET BEST VALUE OF UNKNOWN?

2. WHAT IS SHAPE OF PEBBLE-CURVE OF OBSERVED QUANTITY?

3. WHAT HAVE #1 AND #2 TO DO WITH ONE ANOTHER?

Placard 2

1. How should I combine the results of a number of observations so as to get the best value of the quantity sought for?

—That's my fundamental question.

2. What is the shape of the pebble-curve of a single observed quantity?

And if I am very thoughtful, I can formulate a third:

3. What have questions 1 and 2 to do with one another?

Gauss did not think of questions 2 and 3 at first. When he was 18, he decided on an answer to the *first* question, his so-called *Method of Least Squares*. Now you may be thinking: the first question is easy to answer. If I observe a quantity several times in the same way, the best value of the quantity is the average, or mean, of the observed values. For example, if I observe a star at heights

$$64°,\ 63°,\ 66°,\ 63°$$

the accepted rule is to estimate its true height at

$$\frac{64 + 63 + 66 + 63}{4} = 64°.$$

Most people know that. So did Gauss. But remember the other problem with observations: I may not be able to see what I want. Let's see what difficulty this will cause us.

Suppose I want to know the value of a quantity

$$X.$$

(X, X. I wanted to keep X out of this talk, but when it heard I was giving a serious lecture on Gauss's work it insisted on being let in. Now that it's here, it's going to bring Y and Z with it. But I won't let them take over. What you have to keep in mind is that X is the quantity I want to know, and Y and Z will be the quantities I can observe.)

If I can observe X itself, I take as the best estimate of X the mean of the observed values. This is the usual rule.

If I can't observe X, but I can observe one other quantity Y which is closely related to X, then I simply apply the usual rule of the mean to Y, and then get X from Y. For example, suppose I know from theory that

$$Y = X^2$$

and I observe these values of Y:

$$64,\ 63,\ 66,\ 63.$$

Then I estimate the true value of Y to be the mean 64,

$$Y = 64,$$

and therefore I estimate X to be 8, since

$$X^2 = 64.$$

There is nothing new here: I apply the standard rule to Y, then find X from Y.

But what if I am lucky enough to be able to observe not just Y, but also another quantity Z? This ought to be cause for rejoicing. The more observed quantities I can use, the better my determination of X should be. (And this *is* the usual circumstance: several observed quantities for each unknown.) So suppose my situation is this:

WANT TO KNOW:	X
CAN OBSERVE:	Y AND Z
KNOW FROM THEORY:	$Y = X^2$, $Z = 2X$
OBSERVE	Y: 62, 66 Z: 14, 22

(THEN $X^2 = 64$ AND $2X = 18$??)

Placard 3

I want to know X, and can observe Y and Z, and theory tells me that, say, $Y = X^2$ and $Z = 2X$. I observe the values 62 and 66 for Y and the values 14 and 22 for Z. Proceeding in the usual way to take means, I find the mean of the Y-values to be 64 and the mean of the Z-values to be 18. Since $Y = X^2$ and $Z = 2X$ the best estimate for X must satisfy $X^2 = 64$ and $2X = 18$. Then what is X —8 or 9? I don't know what to do. I mustn't *throw away* any data, but it *is* tempting. Should I average 8 and 9, and say $X = 8\frac{1}{2}$? That would be a desperate act. It is one thing to average observations of the same kind, but quite another—and entirely unacceptable—to average derived values such as these.

Thus I see that the means of the observations of Y and Z don't give me X. I need a new approach. Gauss furnished it in 1795, saying: When I choose a value for X, I am also choosing values for Y and Z, since $Y = X^2$ and $Z = 2X$. What I want is to choose X so that

$Y = X^2$, $Z = 2X$

WANT	WANT SMALL ERRORS
Y CLOSE TO 62	Y − 62 SMALL
Y " " 66	Y − 66 "
Z " " 14	Z − 14 "
Z " " 22	Z − 22 "

MLS: CHOOSE X SO THAT
$(Y-62)^2 + (Y-66)^2 + (Z-14)^2 + (Z-22)^2$
IS AS SMALL AS POSSIBLE

Placard 4

Y is close to 62,
Y is close to 66,
Z is close to 14,
and Z is close to 22,

all at once. That's the same as saying I want

Y-62 small,
Y-66 small,
Z-14 small,
and Z-22 small,

all at once. If I do choose Y and Z, these differences will be the amounts by which the observed values differ from the chosen values—that is, the *errors*. So I want all these errors small at once.

To make them all small, I'll make their *sum* small. But some of them might be positive and some negative, so that cancellation would occur in their sum, and the sum might be small while they were not. So I'll make them all positive by squaring them. Then I choose X to make

$$(Y-62)^2 + (Y-66)^2 + (Z-14)^2 + (Z-22)^2$$

as small as possible.

This is the Method of Least Squares: to choose X so that the sum of the squares of the differences between the corresponding values of Y and Z and the observed values of Y and Z is as small as possible—that is, so that the sum of the squares of the *errors* is as small as possible.

This choice of X is easily made by using calculus. The details needn't concern us. (You might like to know that the result in the present case is 8.02—very different from the 8.5 we desperately considered before.) The precise formula needn't concern us too much either. What is important is this:

> There was an old working rule: when you observe a quantity several times, the best estimate of its true value is the mean of the observations. This usually fails to help when only indirect observations can be made. For that case Gauss gave a new working rule: Choose X by the Method of Least Squares. It reduces to the old one in the case of direct observations.

For this method we have the authority of Gauss, aged 18. That's something. We have more: the method proved very successful in astronomical applications. That's fine, but there is something arbitrary here. Granted that one wants to make these errors small, and even that it is appropriate to form their sum, why square them? Why not use their absolute values, or their fourth powers? Gauss said that the calculations were easiest his way. Very well, but one could ask for a firmer basis for something so important.

Gauss was not satisfied, and two years later he thought about the first problem

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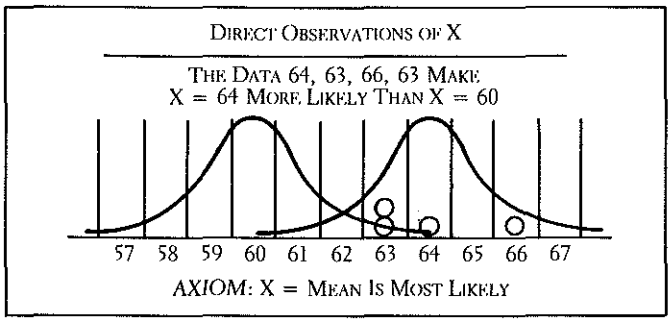
Placard 2

again, in a new way. So we'll begin again too. We have no Method of Least Squares; we are again facing question 1.

Let me think about this problem from the point of view of *likelihood*, and see if I can find a logical approach to it. Given my data, what I would like to find is the *most likely* value of X. What does that mean? Well, if I considered two possible values of X equally likely *before* I had the data, I will consider one of them more likely than the other *afterwards* if the data I did get are more likely to have been obtained if the first value was the true one than if the second one was.

Let me illustrate this in the case of direct observations of X.



Placard 5

Before observing, I considered 60 and 64 equally likely to be the true value of X. I observed 64, 63, 66, 63. Here is where the pebbles fell. Now if the pebble-curves for the two values 60 and 64 look like this, I can see that pebbles would be much more likely to fall where they did if X was 64 than if X was 60. So I consider 64 a more likely value for X than 60. And by this kind of reasoning I can make sense of the *most* likely value for X.

This approach can be extended to the case of *indirect* observations—where I can only see Y and Z; so I would seem to have a logical principle for choosing X: just take the most likely value. But there is a hitch: this method depends on the shape of the pebble-curve. If I don't know that shape, I can't compare the likelihoods of different values of X to find the most likely. And I don't know it.

What to do? Gauss said: In the case of direct observations of X I already have an accepted rule: use the mean. Suppose I assume that that rule in fact gives me the most likely value. That is, I take as an *axiom* that the mean of several direct observations is the *most likely value* for the unknown. Does this help? Does it help to assume that I know how to handle this special case?

Yes! The astonishing thing is that if I alter the working rule of the mean to that axiom, there is only one shape the pebble-curve can have! (I could write down a formula for it.) With this shape determined, I can pursue my approach of finding the most likely value of X; and that turns out to be precisely the value given by the Method of Least Squares! *That method is thereby re-established, this time as the method which chooses the most likely value of* X. And questions 2 and 3 are answered.

But what about that new axiom of the mean? What Gauss did was to take the working rule of the mean—"Take the mean and you will get the best value, whatever that means"—alter it to a specific prediction—"Take the mean and you will get the most likely value"—and then elevate it to an axiom, from which the Method of Least Squares could be deduced. But the axiom is stronger than it looks: its acceptance entails the acceptance of a precise shape for the pebble-curve. If that shape is in fact slightly different, the axiom fails, and can no longer provide a foundation for the Method of Least Squares.

Now experiment does show that the shape predicted by the axiom is approximately correct for all kinds of observations, and the discovery of its precise description was an achievement of the first order. Nevertheless, Gauss was again not satisfied. So we face question 1 again.

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Placard 2

Almost a quarter-century later Gauss adopted a different approach, perhaps closer in spirit to his original naive one. He thought of the act of determining a quantity by taking observations as the playing of a game—gambling—a game in which there are only losses to be had, no winnings. The game goes like this. I observe Y and Z several times, and then I say, "I think X is . . . *this*!" In so saying, I probably miss the true value by a little. I count the miss as giving me some loss, and I ask: What is my *best strategy* for choosing X, the one which makes this loss smallest on the average? I have a new principle for choosing X: I seek to do well in the game of estimation.

Now to choose my strategy, I need first to decide how much loss a given error represents to me. Should I consider that the losses increase as the errors—that an error twice as big as another means a loss twice as big? Gauss admitted that the choice is somewhat arbitrary—under what rule do *you* play?—but chose the *square* of the error as the measure of loss, thus:

THE ESTIMATION GAME

X IS REALLY 64

IF I SAY X = 65, I LOSE $1
" " " X = 66, " " $4
" " " X = 67, " " $9

Placard 6

If you agree that large errors are much less frequent, and more serious, than small ones, this is not unreasonable; and besides, said Gauss, it is mathematically simple.

With this version of the game, Gauss proved a remarkable theorem, namely that there is a best strategy, and it is—the Method of Least Squares! no matter what the shape of the pebble-curve is. This is remarkable because it says that no matter how the errors occur—no matter how the pebbles go into the box—the same computational method gives the best value of X. *The Method of Least Squares is established once more,* no longer as the method which gives the *most likely value* of X—it does that only for one shape of the pebble-curve—but *as the method giving the most prudent play in the game of estimation.*

Let me recapitulate. We can regard these successive developments as giving choices of the proper meaning of "best value" in the problem of choosing the best value of the unknown X.

OLD RULE:	BEST VALUE IS *Mean*
1795 RULE:	BEST VALUE *Given by MLS*
1797 DEF:	BEST VALUE IS *Most Likely*
AXIOM:	MEAN IS SUCH
THM:	1. SHAPE OF P-C KNOWN
	2. MLS GIVES BEST VALUE
1821 DEF:	BEST VALUE *Minimizes Loss*
AXIOM:	LOSS GOES AS SQ. OF ERROR
THM:	MLS GIVES BEST VAL. FOR ANY P-C

Placard 7

The *old rule* was: If X is observed directly, the best value is the mean of the observed values.

In 1795, Gauss proposed a *new rule:* The best value of X is that given by the Method of Least Squares, in which the sum of the squares of the errors is minimized.

In 1797, he offered this *definition:* The best value of X is the *most likely* one—the one which makes the data most likely to have occurred. To use the definition he needed an *axiom:* In the case of direct observations, the mean gives the best value in the sense of the definition. From the axiom he could prove a *theorem,* or rather two theorems: The shape of the pebble-curve is known; and because of its shape, the Method of Least Squares gives the best value of X.

Finally, in 1821 he employed a new *definition:* The best value of X is that which results from the strategy which minimizes loss in the game of estimation. Again, he required an *axiom:* Loss in the game goes as the square of the error (a doubled error means a quadrupled loss). And he proved a *theorem:* The Method of Least Squares gives the best value of X, regardless of the shape of the pebble-curve.

Now what of this long study? What kind of achievement does it represent?

First, Gauss was right. The Method of Least Squares and Gauss's curve have dominated the theory of observation and its applications in all areas of science since his time. It is really difficult to exaggerate their practical importance. Only recently has there been significant departure from these ideas. One can still say that the world of chance phenomena is to be seen essentially as Gauss saw it. Thus, Gauss's mathematics was good: it applied where he meant it to.

But how did he come to be right? Did he proceed deductively, as mathematicians are sometimes said to do? No; there was nothing from which to deduce his method. Yet the Method of Least Squares is a *theorem*—at least, Gauss felt it to be one. So the theorem came first—not itself a first principle, nor an established fact from which one could induce with all certainty. Rather, it was a perceived truth, perceived with confidence if not certainty. Perhaps the ability to discover, or to recognize, such truths is the essence of the mathematical intellect. Proofs often come later; so do axioms.

We are privileged to see here the search for foundations which did come after. Axioms are called up by the theorem—and, of course, are bound by it. Now sometimes such a search may appear to be nothing but a clearing up of details. For example, the great work of the nineteenth century on the foundations of calculus may appear that way—as mere necessary criticism. But in the present case we see the probing of a mystery which is open to everyone's attention. The seemingly "logical" approach of choosing the *most likely* value of X did not come first. When it came, it needed an axiom to support it; and that axiom was felt to be too restrictive, and so was replaced by another, representing another point of view. A very interesting development! And of course the appropriateness of the axiom we are left with is open to dispute. And the search for foundations was undertaken in the full knowledge that this might be so. Gauss may be considered the founder of the modern axiomatic method, in which axioms take their place as tools of discovery rather than unalterable truths.

We observe the world—insofar as observation is a matter of precise measurement—only through a chaos. Faced with this apparent chaos, the chaos of observations, Gauss showed us where to see what we look at, and discovered a fundamental shape hidden in the world. He penetrated to the connections between his intuitions of error, likelihood, and the game of estimation, on the one hand, and the order waiting to be perceived, on the other.

The foundations he provided are as firm as his sight was clear. They were not the last word; there is no last word in these matters. But in looking over the sequence of his thought we see that one might say that order was first brought out of chaos by *fiat*—as we are also told elsewhere. Thank you.

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