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LEADING ARTICLE:

I The Dove

ON THE SUBJECT of thermonuclear war there have been spoken a few hysterical truths and a lot of dispassionate nonsense. Surely everyone, with the exception of a very few genuine psychopaths, wants to "ban the bomb", if only the U.S. and U.S.S.R. could find some agreeable way to do this. Yet we find anyone who recommends it is openly labelled at once a freak, crank or comsymp.

Time magazine identified (for those of its readers too busy to have heard of *Principia Mathematica*) Bertrand Russell as an "octogenarian peacenik". Linus Pauling was questioned by a senate committee because he circulated a peace petition among fellow scientists. On the other hand, *is* there any real point in sitting down at Trafalgar Square, in peace petitions, in SANE, in the Aldermaston march or even in gasoline suicide before the U.N. Whom are they supposed to affect?

If we try to imagine the feelings of a SAC general we are likely to come up with something like: (1) I'm only doing a job; (2) *It* will never happen; or (3) *It* will happen, and I get to be in on the fun of button-pushing. (The last statement could be easily transformed into a generalese slogan about commitment and dedication, of course.)

If we try to imagine the feelings of a peace marcher, we are likely to find: (1) If I can get my nation to disarm alone, the other side will not be able push this to a thermonuclear duel; (2) If my side disarms, the other side can safely disarm, too, without fear of attack; or (3) If people on the other side see how easy it is to persuade a nation to disarm, they will disarm theirs, too.

It is hard, almost impossible, to believe any of the six things above before breakfast. We are mostly mixtures of SAC general and peace marcher—more of the latter, as the fact we are alive testifies. But our thinking about future war is doublethink; we are horrified by it but we cannot seem to stop preparing for it.

Konrad Lorenz has pointed out that the dove, or pigeon, is a very aggressive bird, given to fighting with its own kind. As a symbol of our paradox-ridden thinking, we have made of it the dove of peace, our U.N. symbol.

II History as Enigma

THE FUTURE, SAYS Robert Heilbroner[1], presents two faces. We see it as a summation, but each future event contains also the seeds of *its* future. Thus part of our inability to cope with the future is due to our not understanding history.

We have no guarantee that "history" is fact, or an apprehension of fact. First, the data of the past are not entirely retrievable. Second, even if they were, there would be no reason to suppose the facts of the past "make sense", in the way the entities of science make sense.

Some data of the past are irretrievable because they never were recorded, or they were distorted by chroniclers at the time, or they were later "revised". There were no witnesses to Hitler's suicide. Herotodus numbered the Persian army at two million; had there been that many, the rear of the Persian column could never have left Persia. The deliberate falsification of school history books is done on both sides of the Iron Curtain.

Even if we could interrogate the past and get only truthful answers, there need not be any Big Picture. The facts of the past may belong to a system without laws, to a kind of chaos.

Or, though non-chaotic, the past may be so complex a system that it *seems* like chaos. On the individual level, a person either really has "free will", or seems to have it, because he is a complex organism governed by complex laws. If the former, psychology is pointless, for human behaviour is then unexplainable. Like the psychologist, the historian bets on the latter being the case, and hopes the laws are not more complex than his powers of analysis. So far, no general historical laws have been discovered.

An additional hindrance to our studying the past is the imprecision of the language, hence the thought we use in analysis. What do we mean by a nation's prosperity? Do we mean its gross national product? Its estimated natural resources? Its average income? Its living standard? The words "prosperity" and "nation" are themselves hard to define. Nevertheless, we feel there are really such things as prosperous nations, and we make statements about them.

The truths of history are not as the truths of science.

III The History Within Us

HUMAN "EVENTS" CANNOT be analysed in the same way as the events of physics. One theory seems as true as another, and no progress

PEACE & PARADOX

has been made in formulating general "laws" of history. But the paradoxes embedded in the past, and in language, are not necessarily unresolvable. Perhaps the resolutions are not to be found in history itself—which is, after all, a metaphysical structure and our "child" —but in ourselves, the makers and describers of history.

What we seek in history is not the knowledge of an external thing but a knowledge of ourselves[2].

Cassirer said, adding that Burckhardt did not "hesitate to propound the paradox that history is the most unscientific of all the sciences". History's function is internal, not external; that is, it operates on the imagination, and only, incidentally, the intellect. "History, as well as poetry, is an organon of our self-knowledge, an indispensable instrument for building up our human universe."[3]

IV Paradox

WHEN PARADOX OCCURS in mathematics or symbolic logic, it usually means re-thinking the problem in a more general way. If we discover the "elephant" (a tree) and the "elephant" (a snake) and the "elephant" (a fan), perhaps our blind groping requires, if not sight, an elephant reduced in scale.

Suppose a judge condemns a man to death and tells him, "You will be hanged one day next week, but you will not be hanged on any day on which you *expect* to be hanged."

The condemned then reasons that he cannot in any case be hanged on Saturday, last day of the week, since if he had not been hanged already, he would certainly be expecting to be hanged then. So he can only be hanged Sunday through Friday. But he cannot be hanged on Friday, either, since if he had not been hanged already, he would certainly be expecting to be hanged then. So Friday is likewise eliminated, as are, in turn, Thursday, Wednesday, Tuesday and Monday. That leaves only Sunday on which to hang him. But since he certainly expects to be hanged on Sunday, he cannot be hanged at all.

Thus the condemned man reasons. Having done so, he does not expect to be hanged at all—and can be hanged on any day of the week. The two statements of the judge, which are seen to be contradictory logically, *both* come true.

The paradox here lies in the fact that the condemned man cannot resolve two contradictory statements according to his two-valued logic, and his inability to do so is built into the truth values of the two statements.

V The Prisoners' Dilemma

The theory of games, or *decision theory*, has about it a respectably mathematical sound. It is easy enough to suppose the governments of the two super-powers know what they are doing, since their strategies are based on mathematical "certainties" or "probabilities". It is comforting to know that one's fate is entrusted to experts and machines, the best of each that money can buy. Alas, Norbert Weiner punctures the cocoon:

There are no experts in atomic warfare: no men, that is, who have any experience of a conflict in which both sides have had atomic weapons at their disposal and have used them.[4]

The only experience of a nuclear war which is not immediately catastrophic is the experience of a war game.[5]

And there are *no* certainties about the behaviour of two hostile, sophisticated super-powers, each armed with everything short of a doomsday machine. The experts can be trusted to make up interesting problems and feed them into the computers, and these can be trusted to process such problems and rip out answers to them. That is all. There is not necessarily a tie-in to reality.

If you are playing a game according to certain rules and set the playing-machine to play for victory, you will get victory if you get anything at all, and the machine will not pay the slightest attention to any consideration except victory according to the rules. If you are playing a war game with a certain conventional interpretation of victory, victory will be the goal at any cost, even the extermination of your own side, unless this condition of survival is explicitly contained in the definition of victory according to which you programme the machine.[6]

Decision theory deals mainly with the weighing of alternative strategies according to expected pay-offs. A two-person game can be expressed as a matrix, the columns and rows representing the two players' alternatives, and the intersections showing the payoffs.

Fig. 1 is a matrix in which player A has five possible strategies, player B only one. The payoffs for A are shown in the upper right corner of each square, those for B in the lower left. A's obvious best choice is A_5, shown shaded in the diagram.

But if B is given an alternative strategy (Fig. 2), A's best choice is no longer A_3. Since B will now choose B_2, where his payoff would be from 2 to 8, A must now choose A_3, in order to minimise his loss at −2. The shaded square is an *equilibrium point*. There is only one in this game, and if either player departs from the strategy which will enable him to attain it, he will lose more or win less. Note that in these two diagrams, one player's loss is the other's gain, exactly. This defines the purely competitive, or *zero-sum* game, examples of which are poker, *Go* and most betting games.

The game currently being played by the U.S. and Russia is, however, an example of a *non-zero-sum* game, in which one player's loss is not necessarily the other's gain. Another example is the "Prisoners' Dilemma", as explained by Raymond Aron and Anatole Rapoport.[7]

Two prisoners are being held by the police and questioned separately. Each of them must make the choice of talking or remaining silent, without knowing what his partner is doing. Fig. 3 illustrates their payoffs for each of four possible cases:

If prisoner A chooses silence (S) and his partner likewise clams up, both men will go free, this being represented by a payoff of +1 each. But if A is silent and B talks (T), A will be sentenced to 2 years (−2), while B will earn not only freedom but a reward (+2). B is in an exactly symmetrical position. If *both* men confess (T), they will receive only a light sentence of 1 year each (−1).

The *minimax* principle states that it is best to choose so that, with your opponent playing for his maximum gain, you minimise your own loss. In the game of Fig. 3, A would choose to talk (T), because that would give him at worst a loss of −1; at best a gain of +2 (while S would give −2 to +1). B would choose T for the same reason, and herein lies the dilemma. If both prisoners chose to talk, both would go to jail for a year. *But if they both ignored the best, the most rational decision,* and both chose S, *they would go free.*

It was in an effort to find a better equilibrium point for the "Prisoners' Dilemma" that Prof. Nigel Howard constructed a metagame which goes beyond the given strategies.[8] He gave A four "conditional strategies", namely A_1 (to choose S no matter what B does); A_2 (to choose as he expects B to choose); A_3 (to choose the opposite of what he expects B to choose); and A_4 (to choose T regardless of what B does). Fig. 4 shows the matrix for this metagame, in which no new equilibrium points have emerged.

The metagame may be carried one step further, in allowing B any of 16 new "conditional strategies", based on what B believes A will do. These are shown in Fig. 5. B's sixteen conditional strategies are:

SSSS—Choose S, no matter what.
SSST—Choose S unless A chooses A_4.
SSTS—Choose S unless A chooses A_3.
STSS—Choose S unless A chooses A_2.
TSSS—Choose S unless A chooses A_1.
SSTT—Choose S if A chooses A_1 or A_2 only.
STST—Choose S if A chooses A_1 or A_3 only.
TSST—Choose S if A chooses A_2 or A_3 only.
STTS—Choose S if A chooses A_1 or A_4 only.
TSTS—Choose S if A chooses A_2 or A_4 only.
TTSS—Choose S if A chooses A_3 or A_4 only.
TTTS—Choose T unless A chooses A_4.
TTST—Choose T unless A chooses A_3.
TSTT—Choose T unless A chooses A_2.
STTT—Choose T unless A chooses A_1.
TTTT—Choose T no matter what.

Two new equilibrium points emerge at this stage, in addition to the old (−1, −1). They are at the intersections of A_2 with SSTT and TSTT (shaded in Fig. 5). Of these two, the preferable for B to choose is TSTT, which would give him an advantage in case A chose A_1. TSTT is also better than TTTT, the only strategy producing the old equilibrium point (−1, −1). Howard further proved that no new equilibrium points emerged if metagames of a higher order were constructed.[9]

One cannot jump to the conclusion that the Pentagon and Kremlin have been faced with decisions resembling those of prisoners A and B. But we have trusted our experts' judgement. We have supposed that, at worst, they were too cynical (but pragmatic), too clinical (but punctilious). Alas, the reverse is true. They have naïvely depended upon a flawed and fundamentally shaky theory.

It is not too hard to imagine a game involving the U.S. and the U.S.S.R. in which some analogous dilemma is not solved, in which both then make a "best move" which is mutual destruction. Nations are inclined to weight their decisions with values like national honour, reputation and glory. Like gangsters, too, they are capable of stupid vindictiveness. Said expert Herman Kahn:

> The number of children born seriously defective would increase, because of war, to about 25 per cent above the current rate. This would be a large penalty to pay for a war. More horribly still, we might have to continue to pay a similar through smaller price for 20 or 30 or 40 generations. [This is 600 to 1200 years! JTS.] But even this is a long way from annihilation. It might well turn out, for example that U.S. decision makers would be willing to accept the high risk of an additional 1 per cent of our children being born deformed *if that meant not giving up Europe to Soviet Russia.*[10]

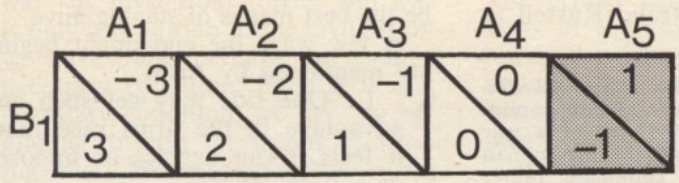
Thus the voice of the "expert" on atomic warfare, queerly optimistic, impatient, incautiously ignoring the meagreness of data on his subject. His prediction about those faceless "decision makers" is more accurate; "it might well turn out" that they would base decisions on the figures given them by the Kahns. As Weiner saw it:

> Here those who conjecture the least amount of secondary damage, the greatest possibility of the survival, of the nations under the new type of catastrophe, can and do draw about themselves the proud garment of patriotism.[11]

And there was Kahn on cue, over-eager to ignore his lack of reliable data, to get down to pencil and paper and figure it all out at once:

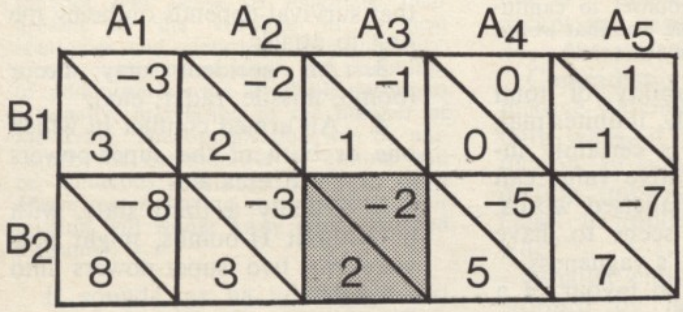
No. of Dead	*Years Necessary for Economic Reconstruction*[12]
2 million	1 year
5 million	2 years
10 million	5 years
20 million	10 years
40 million	20 years
80 million	50 years
160 million	100 years

He does not say how long it would take to recover if, say, 3,000 million were killed. Could we extrapolate, however, to 2 millenia? How do we know the survivors would *want* to economically reconstruct



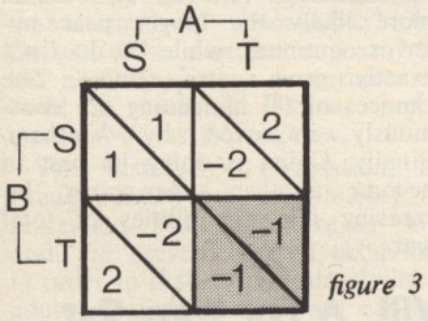
	A_1	A_2	A_3	A_4	A_5
B_1	−3 / 3	−2 / 2	−1 / 1	0 / 0	1 / −1

figure 1



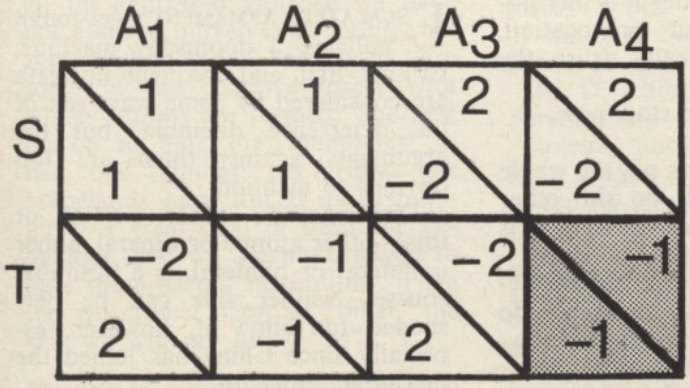
	A_1	A_2	A_3	A_4	A_5
B_1	−3 / 3	−2 / 2	−1 / 1	0 / 0	1 / −1
B_2	−8 / 8	−3 / 3	−2 / 2	−5 / 5	−7 / 7

figure 2



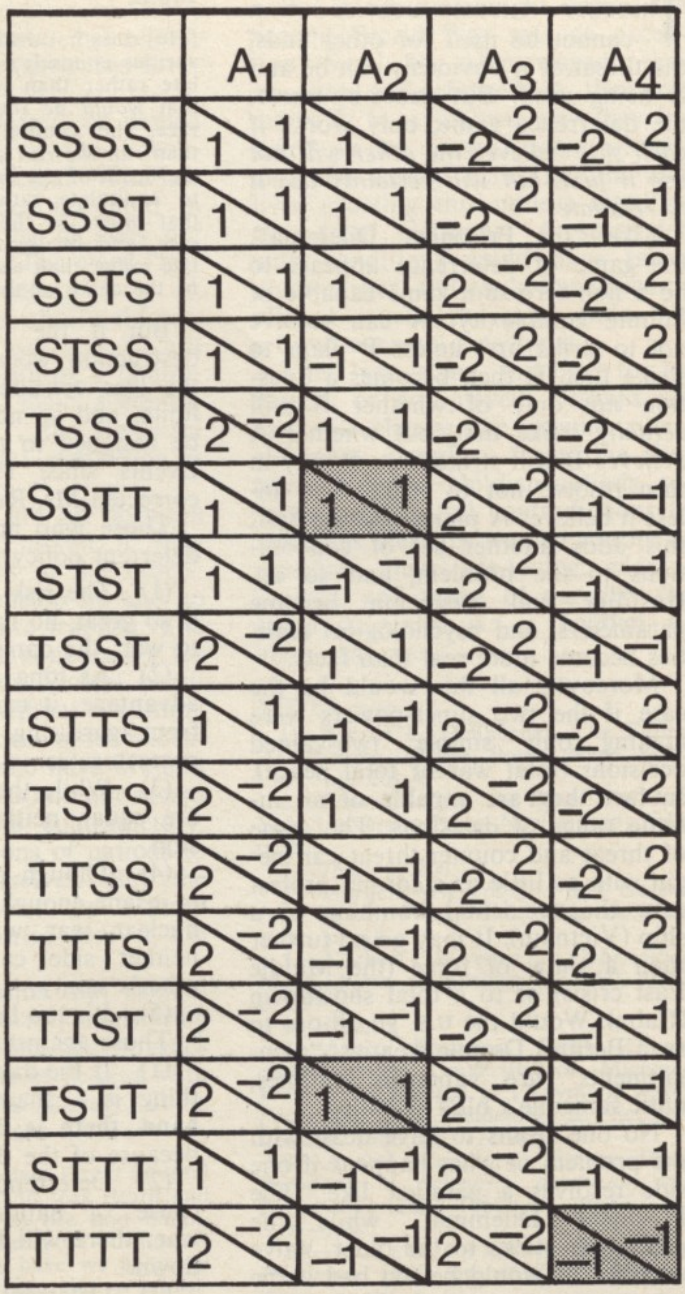
		A	
		S	T
B	S	1 / 1	2 / −2
	T	−2 / 2	−1 / −1

figure 3



	A_1	A_2	A_3	A_4
S	1 / 1	1 / 1	2 / −2	2 / −2
T	−2 / 2	−1 / −1	−2 / 2	−1 / −1

figure 4



	A_1	A_2	A_3	A_4
SSSS	1 / 1	1 / 1	−2 / 2	−2 / 2
SSST	1 / 1	1 / 1	−2 / 2	−1 / −1
SSTS	1 / 1	1 / 1	2 / −2	−2 / 2
STSS	1 / 1	−1 / −1	−2 / 2	−2 / 2
TSSS	2 / −2	1 / 1	−2 / 2	−2 / 2
SSTT	1 / 1	1 / 1	2 / −2	−1 / −1
STST	1 / 1	−1 / −1	−2 / 2	−1 / −1
TSST	2 / −2	1 / 1	−2 / 2	−1 / −1
STTS	1 / 1	−1 / −1	2 / −2	−2 / 2
TSTS	2 / −2	1 / 1	2 / −2	−2 / 2
TTSS	2 / −2	−1 / −1	−2 / 2	−2 / 2
TTTS	2 / −2	−1 / −1	2 / −2	−2 / 2
TTST	2 / −2	−1 / −1	−2 / 2	−1 / −1
TSTT	2 / −2	1 / 1	2 / −2	−1 / −1
STTT	1 / 1	−1 / −1	2 / −2	−1 / −1
TTTT	2 / −2	−1 / −1	2 / −2	−1 / −1

figure 5

anything? Or did Kahn envisage them building up for World Wars Four, Five and so on?

Clausewitz has said that war is the continuation of diplomacy by other means. Perhaps we have finally reached a point where this is no longer true. One cannot figure a thermonuclear war on a global scale into any diplomatic measure—it is the end of diplomats and the people they represent. Thermonuclear war cannot be realistically used for other ends which post-date it in time.

Supposing our experts really were expert in atomic warfare, supposing their understanding of decision theory were irreproachably consistent and complete, there are still a few loose ends: How can one assign numerical values to non-equivalent things, and "equate" them? How many deformed children make enough to "keep Europe" (whatever that may mean)? How many Vietnamese children's lives make enough to "keep Vietnam"? How can deaths be lumped into equations along with abstract entities like "the American image", "the democratic way" or "U.S. prestige in South-east Asia"?

VI The Deterrence Paradox

THOUGH THERMONUCLEAR WAR cannot be used for other ends, the threat of it obviously can be and is being used. But peace-by-terror, the deterrence game, only works *if each side believes the other will not use it first, but will certainly use it to retaliate.*

Like "the Prisoners' Dilemma", the game of deterrence appears to be a non-zero-sum game capable of infinite complexity. A can resolve not to strike first unless B plans to strike first. It then becomes a question not only of whether B will *actually* strike first, but whether A *believes* B will strike first. B may in turn resolve not to strike first unless it believes A plans to strike first; this adds another set of convolutions to the problem, and so on. Hostility and suspicion become parameters, and psychological realities become more real than facts.

Moreover, all this would be the case if the two super-powers were making only simple, two-valued decisions (total war or total peace). In fact they are capable of an infinite range of decisions. The game of threat and counter-threat can begin with as little as a formal protest over the accidental bombing of a ship (Vietnam). It may go no further than a show of force (the Middle East crisis) or to a total showdown (Cuba). Would the U.S. go all-out to save Berlin? Despite treaties, "commitments" are vaporous outlines, until someone's bluff is called.

No one seems to have dealt with the problem of what happens if one side resolves a paradox like "The Prisoners' Dilemma", while the other side sticks to the older, naïve decision. It would be too bad if the smarter super-power decided that it could not be hanged at all. . . .

VII Raising the Ante

EACH STEP IN the thermonuclear, biological and chemical warfare races, in the missile and space races, each step in defence network and anti-missile missile races is presumably meant to guarantee peace — at least until the opposition catches up—yet it increases the likelihood, in the event of war, of total destruction. We are approaching the capability of committing certain and complete suicide. Under present circumstances, it is no use complaining, as Aron did of Bertrand Russell in 1963:

> [He] does not distinguish clearly between various counsels: the counsel to capitulate rather than *run the risk* of a war that *would be* the death of the human race, the counsel to capitulate rather than *run the risk* of a war that *might be* the death of the human race, the counsel to capitulate rather than *wage* a war that *might be* the death of the human race, and finally the counsel to capitulate rather than *wage* the war that *would be* the death of the human race.[13]

But if the probability of total destruction were only infinitesimal, the loss considered is certainly infinite, and so no relative value can be assigned to the italicised words. Events since 1963 seem to have corrected Mr. Russell's vagueness.

Those who argue in favour of a deterrent policy say:

(1) The risk of killing humanity is so great, no nation would dare go to war; the danger is nil.

(2) As long as one side has the advantage, it can prevent the other from aggressing, against treaty allies, protectorates.

(3) While the two major powers are equal, neither can risk aggression.

(4) Though obviously no nation is insane enough to begin a thermonuclear war without provocation, neither side can really trust the other's sanity.

(5) It's too late to stop, now.

Those against say:

(1) If the danger is nil, the whole thing is a sham. If, on the other hand, there is danger of war, it is because of the deterrent policy.

(2) Deterrence will not work because of nationalist pressures to war; there will have to be a showdown.

(3) Deterrent policies increase mistrust between nations, prevent peaceful solutions.

(4) Armed nations are unwilling to suffer loss of "face" or influence abroad, real or imagined insults or belligerent behaviour on the part of the enemy.

These are only a few of the arguments on both sides. As can be seen, those in favour rely on circular arguments (1), while those against prefer arguing from unproved principles (2). Not surprisingly, logic does not favour either preserving the human race or destroying it. Not on the above grounds. For logic to favour disarmament, it must be shown to be the best means of staying alive.

A few ways the end might begin are mentioned by Aron:

1. One side may get such an advantage in the arms race that it feels it can aggress or impose its will on others.
2. Each, or one side may come to believe that if it does not attack first, the other will, and that survival depends on being the first to attack.
3. An accident may occur (bomb, missile, radar, etc.).
4. An armed conflict in which one or both of the super-powers is involved escalates.
5. Finally a third state, with or without H-bombs, might provoke the two super-powers into a conflict.

Possibilities (1), (2), (4) become more likely the longer peace-by-terror continues, while (3) does not exactly grow more remote. The chances of (4) happening are enormously improved by Vietnam. Finally, China is doing its best to become another super-power, increasing all probabilities of total war.

VIII A Few Ways Out

ESCALATED ARMAMENT, get-tough policies, a doomsday machine, striking first and frequent ultimata are considered by some ways out of the deterrence dilemma, but the arguments against them are too obvious to mention.

Disarmament, either partial or total, either atomic or general, either unilateral or bilateral, is a desirable course. Neither side can be persuaded to follow it, however, especially since China has joined the thermonuclear club.

Aron recommended, in 1963, broadening the U.S. defences by strengthening N.A.T.O. so as to destroy the "bipolarity" of the global system. Instead, N.A.T.O. has been weakened, and the U.S. has moved closer to a confrontation with China.

IX Another Way Out

UNDERSTANDING THE BEHAVIOUR of nations and blocs seems to depend on our understanding our own behaviour. We tend to think of war as an inescapable fact, like the law of the conservation of momentum; we are "swept into

war" by mysterious forces. But war is only a condition of the civilisation we have built, perhaps not even a necessary condition. Even if it is a necessary condition, we may be beginning to have the means of altering this. With reservations, Aron describes a possible Utopia where:

> The nations will gradually surmount their prejudices and their egoism, fanatics will cease to incarnate their dreams of the absolute in political idealogies, and science will give humanity, grown conscious of itself, the possibility of administering the available resources rationally, in relation to the number of the living. The organisation will be universal; the communities of culture will be numerous and small. The so-called *Machtstaaten* having accomplished their mission will wither away into a pacified humanity. . . .[14]

It sounds, as he admits, almost ludicrously hopeful, but what are the alternatives? Apocalypse? An endless, tense, destructive peace? It has never seemed so imperative to build a peaceful Utopia, proof against war, as it does now.

The history of civilisation, as Freud pointed out, is a history of repression. Nations behave as children are prevented from behaving, in order to make them into civilised adults. We project upon our nations all the repressed violence we have not allowed ourselves to indulge in. Xenophobia and xenoclasm are some of the cohesive forces with which nations are formed. The best reason to hate the "outlander" is that our families, our tribes, our homelands have forced us to relinquish a great deal of desirable behaviour, and we are not allowed to hate these sacred institutions. Then too we project upon an "other" the sins we will not allow "us".[15]

> The path of sublimation, which mankind has religiously followed at least since the foundation of the first cities, is no way out of the human neurosis, but, on the contrary, leads to its aggravation. Psychoanalytical theory and the bitter facts of contemporary history suggest that mankind is reaching the end of this road. Psychoanalytical theory declares that the end of the road is the dominion of death-in-life. History has brought mankind to that pinnacle where the total obliteration of mankind is at last a practical possibility. . . . The question confronting mankind is the abolition of repression—in traditional Christian language, the resurrection of the body.[16]

So Norman O. Brown concludes, at the end of his monumental study of repression in Western society. The primal paradox resides in the body of the child, when first he is required by those he loves to "kill", or repress, instinctive behaviour, i.e., when he first experiences love-hate.

Whatever is repressed or denied continues to exist, in the unconscious, if only as a denial. "The law of contradiction does not hold in the id",[17] because the id does not accept any negation. The word "no" does not exist in dreams.

Contradictions are absolutely permissive statements: you can have it both ways, if you affirm a contradiction. In symbolic logic, a contradiction implies "V", the universal class; it implies that everything is true.[18]

Smaller children are on occasion stopped by larger, asked if they would like a punch in the nose—and told that "yes means no and no means yes". They are trapped. The law of contradiction is necessary for communal behaviour. Except poetically, we accept it without condition. Rather, our conscious minds accept it, but *we* (the we who have brought humanity to the brink) do not accept it. We attribute the contradictory, self-destructive actions of nations to forces outside ourselves. But the forces which prevent the erasure of national boundaries forever are inside of us.

R. D. Laing claims that schizophrenics are not merely registering "illness", but seeking, as mystics have sought, a mode of dealing with a cruelly repressive society. It is not only they who are ill:

> We all live under constant threat of total annihilation. We seem to seek death and destruction as much as life and happiness. . . . Only by the most outrageous violation of ourselves have we achieved our capacity to live in relative adjustment to a civilisation apparently driven to its own destruction. Perhaps to a limited extent we can undo what has been done to us, and what we have done to ourselves. . . . We have to begin by admitting and even accepting our violence, rather than blindly destroying ourselves with it, and therewith we have to realise that we are as deeply afraid to live and love as we are to die.[19]

X The Last Game

THAT WAR IS a game was already a truism in 1938, when J. Huizinga said it again. Wars, he claimed, were less attributable to motives of power or material gain than those of "pride, glory, prestige and the appearance of superiority or supremacy".[20]

But surely, we might argue, the Second World War was an exception? Surely the Allies waged a war of pure self-defence? It then remains to be explained why they insisted on an *unconditional surrender,* and wasted many months and lives exacting this useless humiliation from Germany. A surrender with conditions could have taken place earlier, and could have accomplished exactly the same ends. We refused even to consider it.

The last game remains to be played, or not played. Perhaps we can still change the ground rules, eliminate paradox from the behaviour of our childish nations, resolve the dreadful contradictions in ourselves. Perhaps we can restore to ourselves their life-loving, playful aspects, and make of paradox the game it really is: a conflict of ideas, not men.

NOTES ——

1.—Robert L. Heilbroner, *The Future As History,* Grove Press, New York, 1961; pp. 201-4.
2.—Ernst Cassirer, *An Essay On Man,* Yale University Press, New Haven, 1944; p. 203.
3.—*Ibid*; p. 206.
4.—Norbert Wiener, *God and Golem, Inc.,* M.I.T. Press, Cambridge (U.S.A.), 1964; p. 61.
5.—Norbert Wiener, *Cybernetics,* M.I.T. Press, Cambridge (U.S.A.), 1965; p. 177.
6.—*Ibid.*
7.—Anatol Rapoport, *Fights, Games and Debates,* University of Michigan Press, 1960. Quoted in: Raymond Aron, *Peace and War,* Weidenfeld & Nicolson, London, 1966; pp. 771-780.
8.—Anatol Rapoport, "Escape From Paradox" in *Scientific American,* vol. 217, No. 1 (July, 1967); pp. 50-56.
9.—*Ibid.*
10.—H. Kahn, *On Thermonuclear War,* Princeton, 1961; pp. 46-47. Quoted in: Aron, *op cit,* p. 617.
11.—Wiener, *God and Golem, Inc.;* p. 61.
12.—Kahn, *op. cit.;* p. 21. Quoted in: Aron, *op. cit.;* p. 417.
13.—Aron, *op. cit.;* p. 618.
14.—*Ibid;* p. 786.
15.—*Cf,* R. D. Laing, *The Politics of Experience,* Penguin, 1967; pp. 65-83.
16.—Norman O. Brown, *Life Against Death,* Vintage Books, New York, 1959; p. 307.
17.—*Ibid;* p. 320.
18.—*Cf,* W. v. O. Quine, *Mathematical Logic,* Harper and Row, New York, 1962; pp. 51, 163ff.
19.—Laing, *op. cit.;* p. 64.
20.—J. Huizinga, *Homo Ludens, A Study of the Play Element in Culture,* Boston, 1960. First published Holland, 1938. Quoted in Aron, *op. cit.;* p. 770.

an age

brian w. aldiss

part two

The scene opens with a landscape full of strange copromorphic forms, resembling known and unknown phyla. They seem to fill the entire age as well as the entire world, as if earth is having a nightmare in stone about its progeny.

But the viewpoint then dwindles down to an individual man, EDWARD BUSH, an artist. It appears that he is in the Devonian Age, doing rather nebulous work for the Wenlock Institute. He is a mind-traveller, meditative, mother-obsessed.

A party of youngsters turns up, roaring along the Devonian beach. ANN, previously the girl of LENNY, leader of the group, becomes involved with Bush, who needs her very much – it is two years since he left his present (2090 A.D.) in this bout of mind-travel. They are discovered by Lenny, who is beaten by Bush.

After a while the couple decide to take the drug CSD and mind-travel a few million years forward to the Jurassic Age, and clinging together, they take the trip . . .

Chapter Three:

At the Sign of the Amniote Egg

BUSH HAD NEVER like the Jurassic. It was too hot and cloudy, and reminded him of one long and miserable day in his childhood when, caught doing something innocently naughty, he had been shut out in the garden all day by his mother. It had been cloudy that day, too, with the heat so heavy the butterflies had hardly been able to fly above flower-top level.

Ann let go of him and stretched. They had materialised beside a dead tree. Its bare shining arms were like a reproof to the girl; Bush realised for the first time what a slut she was, how dirty and unkempt, and wondered why it did not alter what he felt about her —whatever that might precisely be.

Not speaking, they moved forward, full of the sense of disorientation that always followed mind-travel. There was no rational way of knowing whereabouts or whenabouts on Earth they were; yet an irrational part of the undermind knew, and would gradually come through with the information. It, after all, had brought them here, and presumably for purposes of its own.

They were in the foot-hills of mountains on which jungle rioted. Half way up the mountain slopes, the clouds licked away everything from sight. All was still; the foliage about them seemed frozen in a long Mesozoic hush.

"We'd better move down into the plain," Bush said. "This is the place we want, I think. I have friends here, the Borrows."

"They live here, you mean?"

"They run a store. Roger Borrow used to be an artist. His wife's nice."

"Will I like them?"

"I shouldn't think so."

He started walking. Not knowing clearly what he felt about Ann, he thought that presenting her to Roger and Ver might cement a relationship he did not want. Ann watched him for a while and then followed. The Jurassic was about the most boring place to be alone in ever devised.

With their packs on their backs, they spent most of the day climbing downwards. It was not easy because they could never see their footholds; they were walled off completely from the reality all round them. They were spectres, unable to alter by the slightest degree the humblest appurtenances of this world—unable to kick the smallest pebble out of the way—unless it was that by haunting it they altered the charisma of the place. Only the air-leakers gave them some slight bond with actuality, by drawing their air requirements through the invisible wall of time-entropy about them. The level of the generalised floor on which they trod was sometimes below the "present" level of the ground, so that they trudged along up to their spectral knees in the dirt; or at another time they appeared to be stepping on air.

In the forest, they were able to walk straight through the trees. But an occasional tree would stop them; they felt it as a marshmallowy presence and had to go round it; for its lifespan would be long enough—it would survive the hazards of life long enough—to create a shadowy obstruction in their path.

When sunset was drawing near, Bush stopped and pitched his tent, pumping until it struggled into position. He and the girl ate together, and then he washed himself rather ostentatiously as they prepared for sleep.

"Don't you ever wash?" he asked.

"Sometimes. I suppose you wash to please yourself?"

"Who else?"

"I stay grubby to please myself."

"It must be some sort of neurosis."

"Yes. Probably it's because it always annoys clean blighters like you."

He sat down by her and looked into her face. "You really want to annoy people, do you? Why? Is it because you think it's good for them? Or good for you?"

"Maybe it's because I've given up hoping to please them."

"I've always thought people were on the whole pathetically easy to please." Later, when he recalled that fragment of conversation, he was annoyed that he had not paid more attention to her remark; undoubtedly it offered an insight into Ann's behaviour, and perhaps a clue as to how she could best be treated. But by that time he had come to the conclusion that for all her prickliness she was a girl one could genuinely converse with—and she was gone.

He was wrong in any case to challenge her after she had gone through a tiring day so uncomplainingly; even the Dark Woman had faded off duty.

He woke next morning to find Ann still asleep, and staggered out to look at the dawn. It was like a dream to climb from bed and find the great overloaded landscape outside; but the dream was capable of sustaining itself for millions of years. But a million years . . . perhaps by a scale of values of which mankind might one day be master, a million years would be seen as more meaningless, more of a trifle, than a second. In the same way, not one of these dawns could have as much effect on him as the most insignificant remark Ann might drop.

As they were packing up to move on, she asked him again if he was going to do a groupage of her. He answered as honestly as he could.

"I'm looking for something new to do. I'm at a block—it's a familiar thing for creative artists. Suddenly human consciousness is lumbered with this entirely new time structure, and I want to reflect it as best I can—without just doing an illustration, if you understand. But I can't begin."

"Are you going to do a groupage of me?"

"I just told you: no. You don't know J. M. W. Turner's work, do you?"

"No."

NOT UNTIL THE afternoon, as they were coming down on to the plains, did they see the first creatures of the plains, sporting in a valley. Instinct asserting itself, Bush's impulse was to watch them from behind a tree. Then he recalled they were less than ghosts to these bulky creatures, and walked out into the open towards them. Ann followed.

Eighteen stegosauri seemed to fill the small valley. The male was a giant, perhaps twenty feet long and round as a barrel, his spiky armour making him appear much larger than he was. The chunky plates along his backbone were a dull slaty green, but much of his body armour was a vivid orange. He tore at foliage with his jaws, but perpetually kept his beady eyes alert for danger.

He had two females with him. They were smaller than he, and more lightly armoured. One in particular was prettily marked, the plates of her spine being almost the same light yellow as her underbelly.

About the stegosauri frisked their young. Bush and Ann walked among them, absolutely immune. There were fifteen of them, and obviously not many weeks hatched. Unencumbered as yet by more than the lightest vestige of armour, they skipped about their mothers like lambs, often standing on their tall hind legs, sometimes jumping over their parents' wickedly spiked tails.

The two humans stood in the middle of the herd, watching the antics of the young reptiles.

"Maybe that's why these things became extinct," Ann said. "The young ones all got hooked on jumping their mothers' tails and spiked themselves to death!"

"It's as good as any other theory to date."

Only then did he notice the intruder, although the old man stegosaur had been backing about puffily for

some while. From a nearby thicket, another animal was watching the scene. Bush took Ann's arm and directed her attention to the spot. As he did so, the bushes parted and another stegosaurus emerged. This was a male, smaller and presumably younger than the leader of the herd, his tail swishing from side to side.

The females and the young paid only the most cursory attention to the intruder; the females continued to munch, the youngsters to play. The leader immediately charged forward to deal with the intruder; he was being challenged for possession of the herd.

Travelling smartly towards each other, the two males hit, shoulder to shoulder. To the humans, it was entirely soundless. The great beasts stood there absorbing the shock, and then slowly pressed forward until they were side by side, one facing one way, one the other. They began to heave at each other, using their tails for leverage but never for weapons. Their mouths opened. They displayed little sharp teeth. Still the females and their young showed no interest in what was happening.

The males strained and struggled, their legs bowed until their ungainly bodies almost touched the ground. The older animal was winning by sheer weight. Suddenly, the intruder was forced to take a step backwards. The leader nearly fell on to him. They stood apart. For a moment, the intruder looked back at the females, his mouth hanging open. Then he lumbered off into the nearby thicket and was not seen again.

After a few snorts of triumph, the leader of the little herd returned to his females. They looked up, then resumed their placid munching.

"A lot they care what happens to him!" Bush said.

"They've probably learnt by now that there's not much to choose between one male and another."

He looked sharply at her. She was grinning. He softened, and smiled back.

WHEN THEY CLIMBED out of the far end of the valley, they had a wide panorama of the plains with a river meandering through them. Great forests started again a mile or two away. Close at hand, situated on a long outcrop of rock, was the Borrows' tent, and other signs of human habitation.

"At least we can get a drink," Ann said as they approached the motley collection of tents.

"You go ahead. I want to stay here for a while and think." Bush still had his head stuffed full of dinosaurs. They disturbed him. Morally? Two men disputing over women rarely showed as little vindictiveness as those great armoured vegetarians. Aesthetically? Who could say what beauty was, except from his own standpoint? In any case, that great spinal column, rising to its highest point over the pelvis and then dying away in the spiked tail, had its own unassailable logic. Intellectually? He thought of Lenny, and then diverted his attention back to the sportive reptilian young, so full of wit in their movements.

He squatted on the spongy floor, which here corresponded almost exactly with a boulder, and watched Ann walking away from him. He overcame an impulse to pluck a nearby leaf and chew it; vegetation here was unpluckable by any ghostly fingers.

One of the most curious effects of mind travel was the diminution of light suffered by anyone out of their proper time. Only a few yards away, Ann was already in deep shadow, and the Borrows' bar, although white-painted, was even gloomier. But there were other shades here that added not merely gloom but horror to the scene. Borrow had chosen what was evidently a popular site. Future generations of mind-travellers would also congregate here; it would become a town—perhaps the first Jurassic town. The signs of its future success were all round. Spectral figures of future buildings and people could be seen, drabber and mistier as they were further in the future.

Bush was sitting close to a building very much superior to the tents of his own generation. By its degree of slaty shade, so transparent that he could see the unkempt landscape through it, he judged it to emanate from a time perhaps a century or more ahead of his own. Those future beings had solved many of the problems that in these early days of mind-travel seemed utterly baffling: for instance, the transportation of heavy materials and the installation of electric plants. The future had moved in to live in style in the remote past; Bush's present could do no more than camp like savages here. They would also have solved the problem of sewage; his generation was leaving its excreta strewn from the Pleistocene to the Cambrian without the hope or excuse that it would ever turn into coprolites.

From the future building, people were leaning. So faintly were they drawn on the air, it was impossible to be sure if they were men or women. He had that disturbing feeling that their eyes were slightly brighter than they should be. They could see him no better than he could see them, but the sensation of being overlooked was uncomfortable. Bush turned his gaze away towards the plain, only to realise how covered it was with the misty obstructions of future time. Two faint phantasms of men walked through him, deep in conversation, not a decibel of which leaked through the time-entropy barrier to him. He had already noticed that his shadow woman was near him again; how did she feel about Ann? Ghost though she was, she would have feelings, there in her stifling future. The whole of space-time was becoming stuffed with human feelings. Briefly, he thought again of Monet. The old boy was right to concentrate on water lilies; they might overgrow their pond, but you never caught them swarming over the bank and the nearby trees as well.

He recalled Borrow had been a painter, back in their youth. Borrow would be a good man to talk to. Borrow was hard-hearted, but he could sometimes make you laugh.

As he got up and strolled towards his friend's establishment, he saw that Borrow had very much improved the amenities. There were three tents instead of the pair

there had been, and two of them were considerable in size. One was a sort of general store-cum-trading post, one was a bar, one was a café. Over them all Borrow and his wife had hoisted a great sign: THE AMNIOTE EGG.

Behind the tents, before them, amid them, were other collections of buildings in strange styles of architecture, some of them also called THE AMNIOTE EGG, all of them in various degrees of shadow, according to their degrees of futurity. It had been the presence of these shadows, so clearly omens of success, that had encouraged the Borrows to set up business in the first place; they were flourishing on the paradox.

"TWO AMNIOTE EGGS and chips," Bush said, as he pushed his way into the café.

Ver was behind the counter. Her hair was greyer than Bush remembered it; she would be about fifty. She smiled her old smile and came out from behind the counter to shake Bush's hand. He noted that her hand felt glassy; they had not mind-travelled back from the same year; the same effect made her face greyer, shadier, than it really was. Even her voice came muted, drained away by the slight time-barrier. He knew that the food and drink, when he took it, would have the same "glassy" quality and digest slowly.

They chaffed each other affectionately, and Bush said the old place was clearly making Ver's fortune.

"Bet you don't even know what an amniote egg is," Ver said. Her parents had christened her Verbena, but she preferred the contraction.

"It means big business to you, doesn't it?"

"We're keeping body and soul together. And you, Eddie? Your body looks all right—how's the soul doing?"

"Still getting trouble from it." He had known this woman well in the days when he and Borrow were struggling painters, before mind-travel, had even slept with her once or twice before Roger had become seriously interested. It all seemed a long while ago—about a hundred and thirty million years ago, or ahead, whichever it was. Sometimes past and future became confused and seemed to flow in opposite directions to normal. "Don't seem to get as many signals from it as I used to, but those that do come through are mainly bad."

"Can't they operate?"

"Doc says it's incurable." It was marvellous how he could talk so trivially to her about such momentous things. "Talking of incurables, how's Roger?"

"He's okay. You'll find him out back. You doing any grouping nowadays, Eddie?"

"Well—I'm just in a sort of transition stage. I'm—hell, no, Ver, I'm absolutely lost at the moment." He might as well tell her an approximation of the truth; she was the only woman who asked about his work because she actually cared what he did.

"Lost periods are sometimes necessary. You're doing nothing?"

"Did a couple of paintings last time I was in 2090. Just to pass the time, Structuring time, psychologists call it. There's a theory that man's biggest problem is structuring time. All wars are merely part-solutions to the problem."

"The Hundred Years War would rate as quite a success in that case."

"Yep. It puts all art, all music, all literature, into that same category. All the time-passers, Lear, The St. Matthew Passion, Guernica, Sinning in the City."

"The difference is one of degree presumably."

"It's the degrees I'm up against right now."

They exchanged smiles. He pressed into the back to find Borrow. For the first time—or had he felt the same thing before and forgotten it?—he thought that Ver was more interesting than her husband.

Borrow was pottering about outside in the grey daylight. Like his wife, he was inclining to stoutness, but he still dressed as immaculately as ever, with the old hint of the dandy about him. He straightened as Bush came across to him and held out a hand.

"Haven't seen you in a million years, Eddie. How's life? Do you still hold the record for low-distance mind-travel?"

"As far as I know, Roger. How're you doing?"

"What's the nearest year to home you ever reached?"

"There were men about." He did not get the drift of, or see the necessity for, his friend's question.

"That's pretty good. Could you date it?"

"It was some time in the Bronze Age." Of course, everyone who minded was fascinated by the idea that, when the discipline was developed further, it might be possible for them to visit historic times. Who knows, the day might even dawn when it would be possible to break through the entropy barrier entirely and mind into the future.

Borrow slapped him on the back. "Good going! See any artists at work? We had a chap in the bar the other day claimed he had minded up to the Stone Age. I thought that was pretty good, but evidently you still hold the record."

"Yeah, well they say it needs a disrupted personality to get as far as I got!"

They looked into each other's eyes. Borrow dropped his gaze almost at once. Perhaps he recalled that Bush hated being touched. The latter, regretting his outburst, made an effort to pull himself together and be pleasant.

"Nice to see you and Ver again. Looks as if The Amniote Egg is doing well. And—Roger, you're painting again!" He had noticed what Borrow was stacking. He stooped, and gently lifted one of the plasbord panels into the light.

There were nine panels. Bush looked through them all in growing amazement. All were variations on the same theme, arrangements of perspex and glass in varying depths, dyed, and secured to the base. They were so formed that they carried suggestions of great distances; and their relationships differed according to the point from which they were viewed, almost like a sculpture. Some had moving parts. It was immediately

clear to Bush what they were; abstractions of the time strata gathered so ominously about The Amniote Egg. They had been created with absolute clarity and command.

He put them down with expressionless face. "You've taken up your old hobby again, then," he said.

Borrow swallowed as if it hurt him, staring hard into Bush's face "I thought *you* might understand them."

"I came here after a girl know. I want a drink!"

"Have one on the house. Your girl may be in the bar."

HE LED THE way and Bush followed, too angry to speak. The montages were good—just, cool, selective, individual . . . and they gave Bush that prickle between his shoulder blades which he recognised as his private signal when something had genius; or if not genius, a quality he might imitate and perhaps transmute into genius, whatever the hell genius was—a stronger prickle, a greater surge of electricity through the cells of the body. And old Borrow had it, *Borrow*, who had quit being any sort of an artist years ago and turned himself into a shopkeeper and his pretty wife into an assistant for the sake of cash, *Borrow*, fussy about his shirt cuffs, Borrow had got the message and delivered it back!

What hurt was that Borrow knew he had done it. That was why he had tried to cushion Bush from the shock by reminding him that he held the record for low-distance mind-travel. Bush might be washed up as an artist, but he held the record for low-distance mind-travel! So Borrow had known Bush would recognise the merit of the montages and had pitied him because he (Bush) could produce nothing similar.

How much were those montages fetching in 2090, for God's sake? No wonder The Amniote Egg was flourishing; there was capital to back it now. The shopkeeper-artist was on a good thing, turning his inspiration into hamburgers and tonic water!

Bush hated his thoughts. They kept coming, though he called himself a bastard. Those montages . . . of course . . . Gabo . . . Pevsner . . . in two dimensions —no, they had their predecessors, but these were originals. Not a new language, but a bridge from the old. A bridge he himself might have found; now he would find another, have to find another! But old Borrow. . . .

"Double whisky," he said. He couldn't pull himself together to say thank you as Borrow sat down on a stool companionably beside him.

"Is your girl here? What's she like? Blonde?"

"She's dirty. God knows what colour her hair is. Picked her up in the Devonian. She's no good—I'm only too glad to lose her." It was not true; in his shame, he could not think what he was saying. Already, he wanted to look at the montages again, but was unable to ask.

Borrow sat in silence for a moment, as if digesting how much of Bush's statement he should believe. Then he said, "You still work for the Wenlock Institute, Eddie?"

"Yes. Why?"

"Guy in here yesterday called Stein—must be still around. He used to work for Wenlock too."

"Don't know him." *That* Stein connected with the Institute? Never!

"Need a room for the night, Eddie? Ver and I can fix you up."

"I've got my own tent. Anyhow, I may not be staying."

"Come on, you must have a meal with Ver and me, tonight after we've closed. There's no hurry—there's all the world in the time, as they say."

"Can't." He made an awful effort to pull himself together and stop being a bastard. "What the hell is an amniote egg anyway? A new dish?"

"You could say that in a way." Borrow explained the amniote egg as the great invention of the Mesozoic Era, the one thing that brought about the dominance of the great reptiles over hundreds of millions of years. An amnion was the membrane within a reptilian egg that allowed the embryo reptile to go through the "tadpole" stage inside the egg, to emerge into the world as a fully formed creature. It enabled the reptiles to lay their eggs on land, and thus conquer the continents. For the amphibians from which they had developed laid only soft and gelatinous eggs that had to hatch in a fluid medium, which kept them pegged to rivers and lakes.

"The reptiles broke the old amphibian tie with the water as surely as mankind broke the old mammal tie with space-time time. It was their big clever trick, and it stood them in good stead for I-don't-know-how-long."

"The way your store and bar is going to do for you."

"What's upset you, Eddie, boy? You're not yourself. You ought to go back to the present."

Bush drained his glass, stood up, and looked at his friend. With a great effort, he conquered himself. "I may be back, Roger. I thought—your constructions were okay." As he hurried out of the bar, he saw there was one of the constructions hanging as decoration on the canvas wall.

All the clocks of his mind were hammering furiously. You ought to be glad someone did it. Christ, you ought to be glad your friend did it. But I've suffered. . . . Maybe he suffered—maybe he suffers all the time like me—you never can tell. He hasn't done anything. Those were just flashy tourist gimmicks. I'm so despicable. You've no control over yourself. All this self-recrimination is itself just a cover-up. And beneath that and beneath that—go on peeling the layers away and you'll see they always come alternate, self-love and self-hate, right down to the rotten core. It's my parents' fault. . . . incest motif again. God, I'm so sick of myself! Let me out!

He saw how he had wasted himself. Five years before, he had been doing good work. Now he was just a spineless mind-travel addict.

ONE OF THE ways of escape from himself was to hand. A man and a girl were walking in front of him, so unshadowed that Bush knew they had come back from the same year as he. He hardly glanced at the man. The girl was terrific, with beautiful legs and a sort of high-stepping walk that suited her trim ankles. Her bottom was good and did not slop too much. Her hair was short. Bush could see nothing of her face, but to look at it immediately became his obsession.

It was gambler's urge of which he had long been victim—and now he no longer had the excuse that he needed a model. The odds were stacked high against any girl being a beauty. A thousand girls had pretty posteriors—one in a thousand had a tolerable face. The fever died in him directly he found one that did not match up to his standards. He was a face fetichist. Even as he fell into pursuit, Bush realised—it was an aside—Ann had a pretty face.

He followed the couple carefully, moving from side to side behind the girl, so that by this liberation he could see the maximum amount of her profile. There were tents pitched here, and ragged individuals standing about, wondering what the devil to do with the past now they had it. Bush avoided them.

His quarry disappeared round the corner of a tent. Quickening his pace, Bush followed. He saw the girl was standing alone just ahead. She had turned to look at him. She was a cow. Almost at the same moment, Bush scented danger. He whirled about, but the blow was already descending. The girl's escort had jumped out of the tent doorway, and was bringing a cosh down over his shoulder, hard.

The moment stretched into a whole season, as if the panic in Bush's mind had flushed it of the the man-made idea of passing time. He had more than enough leisure to read the fear and madness—as hateful as the dreaded blow itself—in the man's face, and to perform a whole series of connected observations: I recognise him: he was that odd fellow with Lenny and Ann, blast her: dyed hair: his name was—: but Roger mentioned the name too: why didn't I take it in?: why am I always so involved in something else?: always something egotistic, of course: now I'm in for trouble: Stone—no, Stein, Stein, Stein!

The cosh landed, clumsily but hard, half across his face and half across his neck. He went down. Anger came to him too late (again because he was too self-involved to react quickly to the external situation?) and as he fell he grappled for Stein's legs. His fingers clutched trousers. Stein kicked him in the chest and pulled away. Sprawling on the soggy generalised floor, Bush saw the man run away, past the girl, not bothering about her.

The whole incident had not raised even one grain of Jurassic dust. It remained alien, unstirrable.

Two men came over and helped Bush up. They said something about helping him over to the Amniote Egg. That was the last thing he wanted. Still in a daze, he snatched himself away from them and staggered off, moving out of the tented area, clutching his neck, all his emotions jarring and churning inside him. He remembered the girl's face as she turned to watch him collect his come-uppance: with her heavy brows and silly little nose, she had not been even near to pretty.

Where the crude tents of his own day finished, the shadowy structures belonging to future invaders of the past continued. Bush lurched through them, through the shadows that inhabited them, finally got beyond them and pushed through a green thicket of gymnosperms. A little coelurosaur, no bigger than a hen, and scuttling on its hind legs, ran out under his feet. It startled him, although he had not caused its fright.

Emerging from the thicket, he found himself on the bank of a wide and slow-moving river, the one he and Ann had seen before she left him. He sat by it with a hand over his throbbing neck. There was jungle close at hand, the heavy, almost flowerless jungle of mid-Jurassic times, while on the opposite side of the river, where an ox-bow was forming, it was marshy and bull-rushes and barrel-bodied cycadeoids flourished.

Bush stared at the scene for some moments, wondering what he was thinking about it, until he realised it reminded him of a picture in a textbook, long ago, when he was at school, before the days of mind-travel but when—curiously, as it now seemed—a general preoccupation with the remote past was evident. That would be about 2056, when his father opened his new dentist's surgery. People had gone Victorian-mad during that period—his father had even installed a plastic mahogany rinse-bowl for people to spit into. It was the Victorians who had first revealed the world of prehistory, with its monsters so like the moving things in the depths of the mind, and presumably one thing had led to another. Presumably Wenlock had been influenced by the same currents of the period. But Wenlock had turned out to be the first mind of his age, not a beaten-up failed artist.

The picture in the textbook, long ago, had had the same arrangement of river, marsh, various plants of exotic kinds, and distant forest which now stretched before Bush. Only the picture had also exhibited a selection of prime reptiles: one allosaurus large on the left of the picture, picking in a refined way at an overturned stegosaurus; next, a camptosaurus, walking like a man with its little front paws raised almost as if it were about to pray for the soul of the stegosaurus; its devotions were interrupted by two pterodactyls swooping about in the middle of the picture; then came a little fleet-foot ornitholestes, grabbing an archaeopteryx out of a fern; and lastly, on the right of the picture, a brontosaurus obligingly thrust its long neck and head out of the river, weed hanging neatly out of its mouth to indicate its vegetarian habit.

How simple the world of the textbook, how like and unlike reality! This creaking old green world was never as crowded as the textbooks claimed; nor could the animals, any more than man, exist in such single blessedness. Nor, for that matter, had Bush ever seen

a pterodactyl. Perhaps they were scarce. Perhaps they inhabited another part of the globe. Or perhaps it was just that some imaginative nineteenth-century paleontologist had fitted the fossil bones of some crawling creature together wrongly. The pterodactyl could be purely a Victorian invention, one with Peter Pan, Alice in Wonderland, and Dracula.

It was hot and cloudy—that at least squared with the picture, for none of the animals there had cast shadows—much like the day his mother had said she did not love him and proved her point by shutting him out in the garden all day. He longed now for a good old friendly brontosaurus head to come champ-champ-champing out of the river; it might have done him some good on that other day, too; but no brontosaurus appeared. The truth was, the Age of Reptiles was never quite so overcrowded with reptiles as the Age of Man with men.

AS THE PAIN within him died and his pulse rate slowed to normal, Bush made some attempt to ratiocinate. Guilt kept slipping into his reasoning but he got some things clear.

Stein, for whatever cause, had clearly believed Bush was following him rather than the girl. If Stein was about here, it was likely that Lenny and his buckskin-booted chums would also be around. Their presence might account for the disappearance of Ann; Lenny could have caught her and be holding her against her will. No, be your age, she had seen him and run to him with thankfulness, only too glad to exchange his dirty feet and dim mind for Bush's pretentious chatter. Well, good riddance to her! Though by God, that first evening, across the uncrunching phragmoceras shells, in that little valley, her gesture in raising one crooked leg, the exquisite planes of her thighs, and their sweet creaming excitement. . . .

"Don't get all worked up!" he exclaimed aloud. Another thing was clear. He did not want anything from anyone here, not from Roger and Ver, not from Lenny and his tershers, not from Stein. But it was possible that one or more of them might follow him and beat him up. As for Ann . . . he had no claims on her. He had done nothing good for her.

Bush looked anxiously about. Even the Dark Woman had left him. It was time for him to mind home, to face the trouble at the Institute. The Jurassic, as ever, was a flop, it and its amniote eggs.

He opened his pack and pulled out an ampoule of CSD. His old, ancient, long-ago present was awaiting for him. No reptiles there. Only parents.

Chapter Four:
It Takes More Than Death

MIND-TRAVEL WAS easy in some circumstances, once its principles and the Wenlock discipline were learnt. But to return to the present was as full of pain and effort as birth. It was a re-birth. Blackness hemmed one, claustrophobia threatened, the danger of suffocation was immediate. Bush kicked and struggled and cried with his mind "There, that place!", directing himself forward with the peristaltic movements of some unknown part of his brain.

Light returned to his universe. He sprawled on a yielding couch, and luxury pervaded his being; he was back. Slowly, he opened his eyes. He was back in the Southall mind-station from which he had come. His neck still hurt, but he was home.

He lay in a sort of cocoon in a cubicle that would have remained unopened since he left, one winter's day in 2090. Above his head was the small plant keeping alive some of his tissue and a quarter-pint of his blood. They were almost his only possessions in this age, certainly his most vital ones, for on them, by some awesome osmotic process, he had been able to home like a homing pigeon. Now their usefulness was over.

Bush sat up, tore away the fine plastic skin that cocooned the bed—it was reminscent of a dinosaur rolling out of its damned amniote egg, wasn't it?—and surveyed his cubicle. A calendar-clock on the wall gave him the dry fact of the date: Tuesday, April 2nd, 2093. He had not meant to be away so long; there was always a sensation of being robbed of life when you found how time had been ticking on without you. For the past was not the real world; it was just a dream, like the future; it was the present only that was real, the present of passing time which man had invented, and with which he was stuck.

Climbing out of his pack, Bush stood up and surveyed himself in the mirror. Amid these sanitary surroundings, he looked scruffy and filthy. He fed his measurements into the clotheomat and dialled for a one-piece. It was delivered in thirty seconds flat; a metal drawer containing it sprang open and caught Bush painfully on the shin. He took the garment out, laid it on the bed, removed his wrist instruments, picked up a clean towel from a heated rail, and padded into the shower. As he soused himself in the warm water—unimaginable luxury!—he thought of Ann and her grubby flesh, lost somewhere back in a time that was now transmuted into layers of broken rock, buried underground. From now on, he would have to regard her as just another of his casual lays; there was no reason to suppose he would ever see her again.

In ten minutes, he was fit to leave the cubicle. He rang the bell, and a male attendant came to unlock the door and present him with a bill for room and service. Bush stared at the amount and winced; but the Wenlock Institute would pay that. He would have to report there shortly, prove that he had been doing something in the last two and a half years. First, he would go home and be the dutiful son. Anything to delay the report a little.

Slinging his pack over one shoulder, he walked down the spotless corridor—behind whose locked doors so many other escapees foraged through their minds into the dark backward and abyss of time—into the entrance hall. One of his groupages was there, one of the largest,

bolted on to the ceiling. Bloody Borrow had superseded it. Forbidding himself to look up at it, he went over towards the heat baffles and stepped into the open.

"Taxshaw, sir?"

"Going-home present, sir? Lovely little dollies!"

"Buy some flowers, mister — daffs freshed picked today."

"Taxshaw! Take you anywhere!"

"Want a girl, squire? Take your mind off mind-travel?"

"Spare a cent!"

He remembered the cries of despair. This was home; 2090 or 2093, this was the time track he knew. He could make a textbook picture of it, the unfortunates ranged from left to right, like dinosaurs in the other diagram: male beggar first, then female, then taxshawman pulling his carriage, then toy-vendor, clouting away ragged kid, with flower-woman extreme right, under lamp post; and, in the background, the smart mind-station contrasted with the filthy ragged houses and broken roads. Jostling his way through the little knot of mendicants and hawkers, he started to walk, changed his mind, and went over to a taxshawman sitting sullenly in his carriage. Giving his father's address, he asked how much the ride would cost. The man told him.

"It's far too much!"

"Prices have gone up while you've been flitting round the past."

They always said that. It was always true.

Bush climbed into the vehicle, the man lifted the shafts, and they were off.

The air tasted wonderful! It was a miracle that only this tiny sliver of time, the present, should seem to have the magical stuff in abundance, everywhere, even where there were no people. Clever devices though the air-leakers were, they always made one feel near to suffocation. And it was not only air—there were a thousand sounds here, all striking blessedly on Bush's ear, even the harsh ones. Also, everything that could be seen had its individual tactile quality; everything that had been turned to rubbery glass in the past here possessed its own miraculous properties of texture.

Although he knew he was thoroughly hooked on mind-travel, and would inevitably plunge back again, he loathed the abdication of the senses it entailed. Here was the world, the real world—rattling, blazing, living: and probably a little too much for him, as it had proved before!

Already, as he filled his lungs, as they rattled through the streets, he could see disturbing signs that 2093 was far from being a paradise, perhaps even farther from being a paradise than 2090. Maybe the adage was right that said you could stay away too long; perhaps already the mindless reptilian past was more familiar than the present. He knew he did not really belong here when he could not understand the slogans scrawled on the brick walls.

At one point, a column of soldiers in double file marched down the road. The taxshawman gave them a wide berth.

"Trouble in town?"

"Not if you keep your nose clean."

An ambiguous answer, Bush thought.

HE TOOK SOME while to grasp exactly why the road in which his parents lived looked smaller, baser, altogether more drab. It was not just because several windows had been broken and boarded up; that he recalled from before, and the litter in the streets. It was only as he paid off the man and confronted his father's house that he realised all the trees in the road had been chopped down. In the dentist's neat little front garden, two ornamental cherries had grown—James Bush had planted them himself when he first took over the practice—they would have been coming into blossom about now. As he walked up the brick path, he saw their brown and decaying stumps sticking out of the ground like advertisements for his father's profession.

Some things were the same. The brass plate still announced James Bush, L.D.S., Dental Surgeon. Tucked into a transparent plastic holder, the card still said "Please Ring and Walk In" in his mother's handwriting. As the practice went downhill, she had been forced for economic reasons to become her husband's receptionist, thus providing an unwitting example of time's turning full circle, since it was as his receptionist she had got to know him in the first place. He braced himself to hear a flood of examples of how things had gone further downhill since he left; his mother was always expert at providing tedious and repetitive examples of anything. Grasping the doorknob, he Walked In without Ringing.

The hall, which was also the waiting room, was empty. Magazines and newspapers lay about on table and chairs, notices, diagrams and certificates crowded the walls, rather as if this were a centre for testing literacy.

"Mother!" he called, looking up the stairs. It was gloomy up on the landing. There was no movement.

He did not call his mother again. Instead, he tapped on the surgery door and walked in.

His father, Jimmy Bush, James Bush, L.D.S., sat in the dental chair gazing out into his back garden. He wore carpet slippers, and his white smock was unbuttoned, to reveal a ragged pullover underneath. He looked round slowly at his son, as though reluctant to regard one more human being.

"Hello father! It's me again—I've just got back."

"Ted, my boy! We'd given you up! Fancy seeing you! So you've come back, have you?"

"Yes, father." For some situations, there were no rational forms of speech.

Jimmy Bush climbed out of the chair and shook his son's hand, grinning as they muttered affectionately at each other. He was of the same build as his son, a rather untidy figure. Age and habit had endowed him

with a slightly apologetic stoop, and the same hint of apology appeared in his smile. Jimmy Bush was not a man who claimed very much for himself.

"I thought you were never coming back! This needs celebrating! I've got a little something over here. Scotch mouthwash—dentist's ruin." He fumbled in a cupboard, shifted a steriliser, and brought forth a half-empty half-bottle of whisky.

"Know how much this costs now, Ted? Fifty pounds sixty cents, and that's just a half-bottle. It went up again at the last budget. Oh, I don't know what things are coming to, really I don't! You know what Wordsworth said—'The world is too much with us, late and soon, Getting and spending we lay waste our powers'. He'd have a fit if he were alive today!"

Bush had forgotten his father's literary tags. He enjoyed them. Trying to infuse some life into himself, he said, "I only just got back, Dad. Haven't even reported to the Institute yet." As his father brought two glasses out, he asked, "Is mother in?"

Jimmy Bush hesitated, then busied himself pouring out the whisky. "Your mother died last June, Ted. June the Tenth. She'd been ill several months. She often asked after you. Of course, we were very sorry you weren't here, but there was nothing we could do, was there?"

"No. No, nothing. Dad, I'm sorry. . . . I never. . . . Was it anything bad?" Realising the idiocy of what he was saying, he corrected himself. "I mean, what was the trouble?"

"The usual," Jimmy Bush said, as if his wife had often died before; his attention was straying to his glass, which he lifted eagerly. "Cancer, poor old girl. But it was in the bowels, and she never had a moment's pain with it, so we must be thankful. Well, cheers anyway—good health!"

Bush hardly knew how to respond. His mother had never been a happy woman, but memories of some of her happy hours crowded back on him now, most poignantly. He took a drink of the whisky. It was neat and tasted like some sort of disinfectant, but its course down his throat was gratifying. He accepted a mescahale when his father offered him one, and puffed dutifully.

"I'll just have to let the news digest, Dad. I can hardly believe it!" he said very calmly—he couldn't let his true feelings show.

He left the drink and rushed past his father, through the little conservatory, out to the garden. His pre-fab studio stood on the other side of the lawn. Bush ran across to it and shut himself in.

She was dead. . . . No, she couldn't be, not while there was still so much unfinished between them! If he'd come back punctually. . . . But she was all right when he left. He just had not imagined she, his mother, could die. God, he'd change the damned natural laws if he could!

He raised his fist, shook it, ground his teeth. There had been too many shocks to his ego. Dazedly, he glared about, fixing his gaze with loathing on the Goya, "Chronos Devouring His Children". A reproduction of Turner's "Rain, Steam and Speed" hung on another wall; that, too, with its terrifying threat of dissolution, was unbearable. Worse were his own daubs, and the painful groupages in metal that confronted him with their and his meaninglessness. He set about wrecking the studio. The whole place seemed to fly apart.

WHEN HE CAME back to consciousness, he was lying back in the dentist's chair. His father was sitting nearby, still abstractedly drinking whisky.

"How did I get here?"

"Are you okay now?"

"How did I get here?"

"You walked. Then you seemed to pass out. I hope it wasn't the whisky."

Bush could not answer that foolishness. His father had never understood him; there was nobody to understand now.

Slowly, he pulled himself together.

"How've you managed, father? Who's looking after you?"

"Mrs. Annivale from next door. She's very good."

"I don't remember Mrs. Annivale."

"She moved in last year. She's a widow. Husband shot in the revolution."

"Revolution? What revolution?"

His father looked uneasily over his shoulder. Viewed through the conservatory, the neglected garden lay empty in the April sun. Seeing no spies there, his father was encouraged to say, "The country went bankrupt, you know. All this expenditure on mind-travel, and no returns. . . . There were millions of unemployed. The armed forces went over on to their side, and the government was chucked out. It was hell here for a few months! You were best out of the country. I was glad your mother didn't live to see the worst of it."

Bush thought of The Amniote Egg, prospering. "The new government can't stop mind-travel, can it?"

"Too late! Everyone's hooked on it. It's like drink, knits up the ravelled sleeve of care and all that. We've got a military government now, runs exports and imports and so on, but the Wenlock Institute has a large share in the government—or so they say. I don't take any notice. I don't take any notice of anything any more. They came to me and ordered me to work at the barracks, looking after the soldiers' oral hygiene. I told 'em I've got my practice here. If your soldiers want to, they can come down here to me, but I'm not going up there to them, and you can shoot me before I do! They haven't bothered me again."

"What happened to the cherry trees in the front?"

"Last winter was terrible. Worst one I can ever remember! I had to chop them down for firewood. Just out of pity, I had Mrs. Annivale in here to live with me. She had no heating. Purely altruistic, Ted. I prefer the bottle to sex these days, like a baby. I'm an old man, you know, seventy-two last birthday. Be-

sides, I'm faithful to the memory of your mother."

"I'm sure you miss her very much."

"You know what Shelley said, 'When the lute is broken, Sweet tones are remembered not; When the lips have spoken, Loved accents are soon forgot'. All nonsense! Many things you take no notice of till they're long past, many actions you don't even understand until years after they are performed. By golly, your mother could be a bitch to me at times. She made me suffer! You don't know!"

Bush admitted nothing.

His father continued without pause, as if following a rational train of thought. "And one afternoon when the times were at their worst, the troops were rioting through the city. They burnt down most of Neasden. Mrs. Annivale came in here for protection: she was crying. Two soldiers caught a girl up the road. I didn't know her name—the people have changed so much here these last few years—I don't keep up with them any more—either they've got marvellous teeth or jaws full of rotten ones, because they don't bother us much. Anyhow, she was a pretty girl, only about twenty, and one of these soldiers dragged her up here, into the front garden—my front garden!—and got her down by the wall. It was a nice summer day and the trees were still there then. He was terribly brutal! She struggled so, you see. He practically tore every shred of clothes off her. Mrs. Annivale and I watched it all from the waiting room window."

His eyes were glowing; there seemed to be new life in him. Bush wondered what had passed between Mrs. Annivale and him on that occasion.

HERE WERE THE images of violence and hate again, from which he was never free. What had this rape to do with his father's recollection of his mother? Was it all a fantasy his father had invented to express his lusts, his aggressiveness, his hatred of women, his fear? It was all a puzzle he never wanted to solve; nor was the ancient tabu against talking sex with his father resolved just because his father was already partly drunk; but he saw that perhaps he had not been the only person to have been shut out from his mother's love. He wanted to hear nothing more, longed for the claustrophobic silences of the long past.

When he got up, his father recollected himself.

"Men are like animals," he said. "Bloody animals!"

Once there had been a tabu against arguing with his father. That at least had died where the lobe fins crawled, or some dim place where he had been in retreat from his own life.

"I never heard of an animal committing rape, father. That's man's prerogative! Reproduction was a neutral act, like eating or sleeping or peeing, when it was left to the animals. But in man's hands he's twisted it to mean anything he wants—an instrument of love, an instrument of hate. . . ."

His father drained his glass, set it down and said coldly, "You are afraid of it, aren't you? Sex, I mean. You always were, weren't you?"

"Not at all. You're projecting your fears on to me. But would it be strange if I was, considering the way you used to scoff at me as a kid whenever I brought a girl home?"

"Good old Ted, never forget a grudge, just like your mother!"

"And you must have been pretty afraid of it, too, eh, or wouldn't you have chanced your arm and given me some brothers and sisters?"

"You should have asked your mother about that side of things."

"Ha! Those loved accents are not soon forgot, are they? Christ, what a trio we are!"

"Twosome—only you and me now, and you'll have to be patient with me."

"No, a trio still! It takes more than death to get rid of memories, doesn't it?"

"Memories are all I possess now, son—I'm no mind-traveller, able to live in the past. . . . I've got another bottle upstairs, just for emergencies." James Bush rose and shuffled out of the room. His son followed helplessly. They went up through the dark at the top of the stairs into the tiny sitting room, which smelt rather damp.

THE DENTIST SWITCHED on the electric fire. "We've got a hole in the roof. Don't touch the ceiling or the plaster may come down. It'll dry off in the summer, and I'll try and fix it. Things are very difficult. Perhaps you'll lend a hand if you're still around."

He brought out a whole bottle of whisky, more than three-quarters full. They had carried their glasses upstairs with them. They sat down on mouldering chairs and grinned at each other. James Bush winked. "To the ruddy old human race!" he said. "A man's a man for a' that!" They drank up.

"We're ruled by a man called General Peregrine Bolt. It seems he's not a bad man as dictators go. Got a lot of popular support. At least he keeps the streets quiet at night.

"No more rapes?"

"Don't let's start on that again."

"What has Bolt done to the Institute?"

"It's prospering, by all accounts. Of course, I know nothing. It's nothing to do with me. It's run on more military lines, I hear."

"I ought to report. I'll go first thing tomorrow, or they'll sack me."

"You're not going back into the past again? The new government will organise all that. Now there are so many people mind-travelling, crime rates are rising back there. Two fellows got murdered in the Permian last week, so the grocer told Mrs. Annivale. General Bolt has set up a Mind-Travel Police Patrol to keep order."

"It's orderly enough. I didn't see any crime. A few thousand people spread over millions of years—what harm can it do?"

"People don't stay spread, do they? Still, if you are bent on going back, I can't stop you. Why don't you settle down here and do some more groupages and that, make some real money? Your stuff's all in the studio. You can live here."

Bush shook his head. He couldn't talk about his work. The drink was making his neck throb again. His ear ached. Perhaps what he most wanted was a good sleep. At least he could do that here; there seemed to be few invasions of his father's privacy.

Just as he settled his glass down on the wide arm of his chair, there was a thunderous knocking at the front door.

"It says 'Ring and Walk In' clearly enough, doesn't it?"

But his father had gone pale. "That's no patient. It's probably the military. We'd better go and see. Ted, you come down too, won't you? It may be for you. I haven't done anything. I'll just hide this bottle under the chair. They're getting very anti-black market, damn them! What can they want? I've done nothing. I hardly ever go out. . . ."

Muttering, he went downstairs with Bush close behind him. The peremptory hammering came again before they were down. Bush pushed past his father into the waiting room and went and flung the front door open.

Two armed men in uniform stood on the step. They wore steel helmets and looked far from peaceful. A truck waited behind them in the street, its engine running noisily.

"Edward Lonsdale Bush?"

"That's me. What do you want?"

"Failure to report to Wenlock Institute after overstaying term of mind-travel. You're in trouble and you'll have to come along with us."

"Look, sergeant, I'm on my way to the Institute now!"

"Short cut, is it? You've been boozing—smell it a yard off! Come on!"

He reached back and grabbed his pack off the magazine-strewn table.

"My notes are all here. I tell you, I'm on my way—"

"No arguing, or we'll charge you with riot and you'll find yourself looking at the wrong end of a firing squad. Quick march!"

He looked round despairingly, but his father had shrunk back into the gloom and was not to be seen. They ushered Bush down the path, past the crumbling brick wall where the rape had been committed, hustled him into the waiting truck, shut the door on him. The truck moved away.

Chapter Five:

A New Man at the Institute

HE FOUND IT odd that on the journey he did not waste his time in tension but instead thought lovingly of his father. The old boy had his back against the wall, was to be pitied. His days of dubious power were over; now the situation was reversed—or would be if Bush ever got back to that dingy little house.

Although family grievances were irreparable, that very fact meant that there were unaccountable lulls between the storms, lulls full of the best peace of all, the peace of indifference, when all the horrid things had been said. That was like the incest theme which was popularly supposed to underlie all family quarrels: a mixture of the forbidden best and sweetest and the worst.

He started to think about his mother's death then, testing his reactions. He was still at it when the truck drew to a violent halt and he slid along the bench and landed with a smack against the rear doors. They were flung open, and he half-tumbled out.

While his hands were still on the ground, before he had straightened up between his captors, he took in the dreary surroundings behind the truck. They had driven through a barrier, now closing again, set in a high concrete wall. There were guards rigid at the gate and lounging at a couple of shacks that stood under the wall. The ground, as if recently cleared, was littered with rubble.

The two soldiers led him round past the truck and towards an entrance in a large but unimposing building. With disbelief, Bush recognised it as the Wenlock Institute.

The confusion latent in anyone's mind who has moved between different times and experienced yesterday as tomorrow and tomorrow as yesterday sprang up and overwhelmed him. For a while, he could not believe he was in the right year. The Institute had stood in a quiet side street, with a car park on one side of it, and buildings on the other side and opposite it; it had faced across to an insurance office which had done good business with mind-travellers.

He was marched into the Institute before he had the simple answer. Under the regime of the worthy General Peregrine Bolt, the Institute had been advanced in status; his father had told him that. They had simply demolished the rest of the street and built a wall about the premises, so that the Institute could now be easily defended and everyone who entered or left could be accounted for.

Inside, the Institute had changed very little. Indeed, it seemed to have entered on a period of prosperity; the lighting was better, the flooring improved; closed circuit television had been installed, its bowls transmitting coloured messages steadily. The reception desk had been greatly extended—there were now four uniformed men behind it. The boredom and unease generated by their uniform did more to transform the once unpretentious atmosphere than all the other alterations.

The guards presented a scrap of paper. A uniformed receptionist talked into a silenced phone. They all waited. Finally, the receptionist nodded, hung up, and said, "Room Three." The guards marched Bush over to Room Three—a cubicle on the main corridor—and left him.

THE ROOM WAS empty except for two chairs. Bush stood in the middle of the room, clutching his pack, listening. It seemed as if he had got off lightly; all the horrors he had had in mind, the punches in the teeth, the kicks in the testicles, those characteristic gestures of a totalitarian regime, receded a little. Perhaps his captors had merely had orders to deliver him here as speedily as possible to make his report. He hoped Howells was still here; Howells always took his report and—Bush recognised the symptoms long ago—secretly admired and envied him.

Anxiety made him breathe fast and shallowly. The room was like a little box, and they were keeping him waiting a suspiciously long time.

He would be in trouble. If only they would not mention the year he had over-stayed—if they could understand he had meant to come back, to work properly, to report. He was their star minder.

Or—his brain ran along another track—if it wasn't old Howells but a new man, who did not know he had overstayed his allotted period. But a new man . . . a totalitarian . . . one of Bolt's men. . . .

Knowing absolutely nothing about the current political situation beyond the few words his father had dropped, Bush began to weave a terrible plot in his head, in which he was subjected to brutality and in his turn inflicted humiliation on others. It was as if, with the passing of his mother, his mind had to find other complications to stuff itself with. Recent events, the brush with Lenny's gang, the unexpected blow from Stein, the shock of finding how Borrow had so effortlessly achieved what he hoped to do, the news that his mother was dead by some months, were too much for him. He feared he could endure nothing more.

Sinking back onto a corner chair, Bush took his head in his hands and let the universe thump and rock about him.

Indescribable things rushed through him. As though galvanised by a shock, he jumped up rigid. The flimsy door was open and a messenger stood there. Something was the matter with Bush's eyes; he could not make the man out clearly.

"Do you want me to make my report now?" Bush asked, jumping forward.

"Yes, if you'll follow me."

They took the elevator up to the second floor, where Bush usually went to report. A macabre terror gripped him, a premonition of great ill. It seemed to him that the very interior of the Institute had altered in some way, its perspectives and shadows grown more inhuman, its elevators more cruel, while the metal grill of the elevator closed over Bush like fangs. He was sweating when he leapt out into the upper corridor.

"Am I seeing Reggie Howells?"

"Howells? Who's Howells? He doesn't work here any more. I've never heard of him."

The report room looked as he recalled it, except for the telebowl and one or two additional installations which gave it a sly and watchful atmosphere. There were chairs on either side of the table, report pads, the speech/picture humming idly in one corner. Bush was still standing there, clenching and unclenching his fists, when Franklin entered.

FRANKLIN HAD BEEN Howells' deputy; he was a porky, pale man with goosey flesh and poor eyesight. His eyes swam behind little steel-rimmed glasses. Not a prepossessing man, and Bush recalled now that he had never much liked the man or tried to ingratiate himself with him. He greeted him rather effusively now—it was an unexpected relief to see anyone he knew, even Franklin. Franklin looked puffier, bigger—a foot taller.

"Sit down and make yourself comfortable, Mr. Bush. Put your pack down."

"I'm sorry I didn't report at once, but my mother—"

"Yes. The Institute is being run more efficiently than when you were last here. In future, you will report here *directly* you return to the present. As long as you obey the rules you can come to no harm. Get it?"

"Yes, quite, I see. I'll remember. I hear Reggie Howells has left. So the messenger was telling me."

Franklin looked at him and closed his eyes slightly. "Howells was shot, to tell you the truth."

Bush could not exactly say why, but it was the phrase "to tell you the truth" that upset him; it was too colloquial to follow the content of the rest of the senence. He decided it might be safer not to say anything more on the subject of Howells; at the same time, he concluded that the most ill-advised thing he could possibly do would be what he most desired: to bust Franklin one on his piggy nose.

To hide his confusion, he put his shabby old pack on the table and started to unzip it.

"I'll open that," Franklin said, pulling the pack towards him. He pushed it under a machine by his right hand, looked at a panel above it, grunted, and ripped it open, tipping its contents out between them. Together, they eyed the poor bric-a-brac that had accompanied Bush over such a great span of time.

Chilled by apprehension, Bush felt his bowels contract. His time sense was awry, too, as it had been when Stein hit him. Franklin was reaching out towards the rubbish on the table, his arm moving perfectly under control, a multi-dimensional figure for a series of intricate reactions between nervous and muscular systems and terrestrial gravitational forces, in which air pressure and optical judgements were also involved. It was a textbook case of anatomical mechanics; as Bush watched it, he could see the crude sub-structure of the gesture. As the humerus swung slightly forward, ulna and radius levered from it, wrist bent, finger bones extended like the maimed wing of a bird. Under the blue serge sleeve, lymph chugged.

Disgusted, Bush looked up at the man. The little astigmatic eyes were still staring at him, isolated behind their glasses, but the face was a bare diagrammatic example of a skull, part of the flesh cut away to reveal teeth, palate and the intricacies of the inner ear. A

series of small red arrows sprayed from the gaping jaws into the air towards Bush, indicating the passage of the organism's breath as it said, "Family Group."

It was reading from a sheet of paper it had retrieved from the debris on the table. The paper had been screwed up. The organism had flattened it out and was examining it.

The paper bore a crude sketch in colour, showing a deserted landscape with a metal sea; from a sun, from a tree, faces protruded. Slowly, Bush realised it was something he had executed in the Devonian; he had scrawled on it the title the organism had read out.

He closed his eyes and moved his head from side to side. When he looked again, Franklin looked normal once more, his anatomy decently covered by his suit. He had crumpled up the drawing again and thrown it aside in disgust. Now he was examining more sketches, a series Bush had made on a pad. These sketches were of cryptic forms that never entirely transmuted into any recognisable shape. Bush had piled them up on the page, trying to make them ungraspable, defying unidirectional sense, violating all durations.

"What are these?" Franklin asked.

Perhaps I will just clear my throat, Bush thought. He experienced a certain tension there. This was all very unpleasant. No point, of course, in explaining. . . . He cleared his throat, enjoyed some relief as the mucus ceased its tiny pressure. It was erroneous to assume that events in space-time could be rendered by symbols on to paper—a cardinal error that had stood mankind in good stead ever since the first cave paintings. Perhaps you could invent a way to translate the symbols into space-time. But that was constantly done. A piece of music. . . .

"My notebooks. . . ."

Nodding, Franklin accepted this as an adequate answer. He put the pad carefully on a side tray, a deliberate gesture. For a moment, he threatened to dissolve into a motor-energy diagram, and Bush fought the feeling back.

"I—my notebooks. . . ."

THE ILLUSION, whatever it was, was over. Time snapped back to normal. He could smell the dull atmosphere of the room again, hear noises, the slight sound of Franklin scuffling about in his equipment.

Franklin picked out the notebooks and the wrist camera, sweeping the rest of the stuff into a side tray, a woman's photograph among it.

"Your personal possessions will be returned to you later."

He clipped the first book into the miniscanner on the wall and let it run. Bush's taped voice filled the room, and the recorder behind Franklin redigested it.

Franklin sat where he was without expression, listening. Bush began to drum with his fingers on the table, then pulled them on to his knees. The books took twenty-five minutes each to play and there were four and a half of them full of his reports, spaced over his long months away. When one book was emptied, Franklin inserted the next without comment. He had been trained to make people uneasy; two or three years ago, he would have coughed and twitched in the unpleasant atmosphere; now Bush did it for him.

The reports had been designed for Howells' ear, genial Howells who welcomed any chit-chat. They contained little new information about the past, although there was a reassuringly solid bit on the phragmoceras, and Bush had genuinely researched into the length of earlier years, which increased the further one progressed back in time, through the decrease of the moon's braking effect on the Earth by tidal friction. He had confirmed that in the early Cambrian Period, a year consisted of about 428 days. He had also carefully noted the psychological effects of CSD and mind-travel. But too much of the report now seemed like idle chatter about the people he had met on his wanderings through time, interspersed with artistic notes. When the last book drew to its end, after almost two hours of playback, he could hardly bring himself to look at Franklin, who seemed to have been expanding all this time, as Bush himself was shrinking.

Franklin spoke mildly enough. "What would you conceive the objectives of this Institute to be, Bush?"

"Well. . . . It began as a research centre for mental analysis, enlarging the discovery of the undermind—the theory of it. I'm not scientifically trained, I'm afraid I can't phrase it too precisely. But Anthony Wenlock and his researchers discovered the uses of CSD and opened up the new avenues of the mind that have enabled us to overcome the barriers our ancient ancestors put up to protect themselves from space-time, and so mind-travel was developed. That's simplified. I mean, I understand there are still paradoxes to be unravelled, but. . . . Well, anyhow, now the Institute is HQ of mind-travel, devoted to a greater scientific understanding of . . . well, of the past. As I say, I—"

"How would you say you have served that 'devotion to a greater scientific understanding,' as you put it?"

The recorder was still growling away, holding on for posterity to the insincerity in his voice. He knew he was being trapped. Making an effort, he said, "I've never pretended to be a scientist. I'm an artist. Dr. Wenlock himself interviewed me. He believed artistic insights were needed as well as strictly—well, scientific ones. Also, they found that I was a particularly good subject for mind-travel. I can go farther and faster than most travellers, and get closer to the present. You know all this. It's on my cards."

"But how would you say you serve the 'devotion to greater scientific understanding' you talk so much about?"

"I suppose *you* think not very well. I've said, I'm not a scientist. I'm more interested—well, I've done my best, but I'm more interested in people. Damn it, I've done the job I was paid for. In fact, there's quite a bit of back-pay owing."

Franklin blinked somewhat, as if it were a hobby he

was taking up.

"I'd say by the evidence of these reports of yours that you had almost utterly neglected the scientific side of things. You wasted your time skylarking about. You didn't even stick to the era you were consigned to."

Privately, Bush felt the truth of what Franklin said. This—perhaps fortunately—prevented him from saying anything. He cleared his throat instead; the fist in the teeth, the boot in the testicles, were advancing again.

"On the other hand, you pick up a lot of stuff about people."

Bush nodded. He had spotted that Franklin did not care much for his failure to reply, and felt a little better.

Franklin leaned across the desk and pointed a finger at Bush's face as if suddenly detecting something strange in the room. "The objectives of this Institute have changed since your day, Bush. You're out of date —we have more important things to worry about now than your 'greater scientific understanding'. You'd better get that idea out of your mind. But it was never in very firm, was it? Well, we're on your side now."

HE WATCHED to see the effect this reprieve had on Bush, a sneer on his face. Bush hung his head, disgraced to find such base support for his betrayal of science. Regarding himself as an artist, he had loftily thought of himself as in some measure opposed to science, a supporter of the particular against the general; he saw suddenly how faint, how wishy-washy the notion was; his sort of nonsense had helped this other sort of opposition to science, which he recognised —perhaps from the very smell of this bullying room— as altogether antithetical to human values. He'd gone badly wrong if Franklin could say, even as a sour joke, that they were both on the same side.

His courage came back. He got up. "You're right. I'm out of date! I'm a flop! Okay, I resign from the Institute. I'll hand in my notice right way."

The other man permitted himself one blink. "Sit down, Bush, I haven't finished yet. You *are* out of date as you say. Under the present system of employment, and for the duration of the emergency—I suppose you have grasped there *is* an emergency-—no man can leave his job."

"*I* could leave. I'd just refuse to mind-travel!"

"Then you would be imprisoned, or perhaps worse. Sit down, or shall I call some of our new staff? Better! Look, Bush, I'll give it you straight—the economy is being wrecked because people are all mind-travelling, going by the thousands, the hundreds of thousands! They're getting hold of bootleg CSD; it comes in from abroad. They're disaffected elements, and they represent a threat to the regime—to you and me, Bush. We want men to go back there in mind and check on what's happening, trained men. You'd do a good job there with your talents—and it is a good job, well paid, too—the General sees to that. A month's intensive training and we are going to send you back with proper status, provided you're sensible."

Trying to sort through what the man said, Bush asked, "Sensible? How do you mean, sensible?"

"Useful. A functioning part of the community. You've got to give up this idea of chasing your own personality down the ages."

When he had let that sink in, Franklin added, "Forget all that business about wanting to be an artist. That's all finished, washed up! There's no market or opportunity for works of art any more, and anyhow, you've lost the knack now, haven't you? Borrow proved that to you, surely!"

Bush bowed his head. Then he forced his eyes to meet the slippery ones behind the little lenses watching him from the other side of the table.

"Okay," he managed to say. It was a complete submission to Franklin's argument, an acceptance of everything he had said, an admission that he was useless in any rôle but that of spy or snoop or informer, or whatever they would call it: but even as he delivered himself over to what he recognised instinctively as the enemy, he was born anew in courage and determination, for he saw that his one chance as an artist was to move again as a mind-traveller—saw, moreover, that he was less an artist than a mind-traveller, the first of a new breed whose entire metier was mind-travel, that he would rather die than lose this weird liberty of the mind; and as a corollary to that discovery, he saw that by understanding his personality on this new basis he might eventually come to deliver a new form of art expressing the changed world-view, the new and schizophrenic *zeitgeist*.

Just momentarily, as he glared at Franklin, great joy broke upon Bush; he saw he still had the chance to speak to the world (or the few) of his vision, his unique vision; and then he thought how insignificant he would make the mock-ups of Roger Borrow look; and by that petty step, he came back to reality and the hum of the recorder and Franklin's nose and spectacles.

It was Franklin's turn to rise. "If you wait downstairs, they will bring your personal belongings down to you."

"And my pay?"

"*And* your pay. Some of it. The rest will be issued as post-emergency credits. You can go home then. The next course starts Monday; you're on leave till then— don't do anything silly, of course. A truck will pick you up Monday morning early. Be ready! Understood?"

Malice made Bush say, "Well, it's been nice seeing you again, Franklin. And what does Dr. Wenlock think to all the changes?"

Franklin gave one of his blinks. "You've been away too long, Bush. Wenlock went out of his mind some while ago. To tell you the truth, he's in a mental institution."

Chapter Six:

The Clock Analogy

IT WAS BEGINNING to rain as he walked past the carious tree stumps and the wall by which rapist and raped

had lain together; he climbed the steps to find his father had locked the door. Only after much ringing and knocking and shouting through the letter box did he persuade his father to come down and open up.

His father had absorbed most of the rest of the whisky. With Bush's back pay, they bought more that evening, and were drunk that night and the next day. The drunkenness was a reliable substitute for the friendship they could not quite establish. It also helped to blot out the terror in Bush's mind.

On the next day, the Thursday, James Bush took his son to inspect his mother's grave. They were both sober and heavy then, needing a dose of melancholy. The cemetery was ancient and abandoned, pitched on such a steep and windy hill that grass would grow only on one side of the mounds. It seemed an uncharacteristic place for Elizabeth Lavinia, Beloved Wife of James Bush, to lie. Bush wondered for the first time how she had felt indoors that long day when he was locked out in the garden. Now she was locked out for good, her soul cast on to a steeper, longer beach than any known to Earth's history.

"Her parents were Catholic. She gave up all belief at the age of six."

"Six?" It seemed a curious time to give up any belief; his father might as well have said "six in the evening".

"Something happened to her when she was six that convinced her there was no God. She'd never tell me what it was."

Bush said nothing. His father had kept off the subject of religion since he had returned from the interview with Franklin. Now he teetered on the brink again; the moment was abominably favourable. Bush began to whistle irritatingly under his breath to counteract his father's advantage. Even the thought of religion irritated him.

He did not believe the story about his mother's loss of faith, or whatever it had been, at the age of six. Had such an event occurred, he would often have heard about it from both his parents, who were not ones to tuck away their woes.

"Better be getting back, then, Dad, I suppose." He shuffled his feet. James Bush did not move. He stood looking down at his wife's grave, absently scratching one buttock. Observing him, Bush saw his father put on one of his sanctimonious expressions, which was followed by something perhaps more sincere, perhaps a general empty feeling of puzzlement about what he and Ted and the rest of mankind and the whole writhing bundle of animate things were supposed to be doing with life anyway. Bush found that more alarming than the sanctimonious expression; he was aware enough of where his own enervating self-questioning came from. He hoped his father's years of flirtation with belief were dead and buried; resurrection now would come inconveniently.

"Looks like rain."

"She just didn't know where she stood with God. But she wanted to be buried here. 'Our reasons live their own existences,' as the poet Skellett puts it."

"Can we get a bus back?"

"Yes. You'd be surprised—you can't get a headstone for love or money, nowadays. See this one? I made it myself. How do you like it, Ted? Reinforced concrete, and I did the lettering before it was dry."

"Very professional."

"You don't think it should just have been 'E. Lavinia'? She never used the Elizabeth."

"It's fine as it is, Dad."

"I was pleased with it."

"Yes."

"Sorry you weren't here for it all. It didn't seem right without you."

So her life ended, not just under that mound, where the trickle of water down the hill had already commenced to erode one side of it, but in the exchange of trivialities between her husband and son. As Bush told himself that, he felt convinced that neither of them would come here again. There was a limit to the pointlessness humans could endure.

"But isn't it all bloody pointless?" he said. "Who was she? I don't know, and doubt whether you do. Was there a point to her life—and if so, what? When she was six? If that tale's true, then the rest of her life was anti-climax, and she'd have done better to live her days backwards, with the cancer healing and she getting young again and eventually gaining her baby faith!"

He checked himself on the verge of terror, and they began to move away from the grave.

His father said, "We didn't ask that sort of question when we got married."

"I'm sorry, father. Let's go home. I didn't mean what I said—you always had more sense than I did. It's just—"

"You were the point of her life, just as much as me."

"That's all nonsense, unless you believe the whole purpose of the human race is simply to breed another generation and another. . . ."

His father began to walk rapidly downhill, towards the collapsing lych gate.

IT WAS A cold day. The dentist's house felt damp and they lunched poorly on fried potatoes and salt. Food was short and appallingly dear. In the afternoon, Bush read some of the old magazines down in the waiting room. A patient miraculously appeared, hugging a suppurating gumboil in a scarf, and Bush scowled at the disturbance.

Through the distorting pages of the magazines, he gained a picture of the factors that had gradually brought about the present situation. He had travelled carelessly through life, quarrelling, love-making, talking, painting, without any stay to his appetites or reference to the currents that moved through his generation. He saw now that one of the occasional reactions against a high-powered industrial society had set in some years earlier, expressing itself as a fad for the gas-lit glories of the long-dead Victorian Age. Such reactions soon

blew over when they had nothing to feed themselves on and a new fad came to distract attention. But in the twenty-seventies, the new thing was mind-travel, or its possibiliy, which stoked rather than damped the public nostalgia. In a surprisingly short time, certainly by the mid-eighties, the advanced civilizations of the world had reoriented themselves towards the past—the far distant pre-historic past, since that was paradoxically the easiest to reach, the second law of thermodynamics not extending itself to cover the lower reaches of the human mind. A generation grew up which dedicated itself, its energies and abilities, to escaping from their own time. Every human activity was hit, from the tourist trade (Florida's sands, the Mediterranean beaches, were as deserted as in Victorian times) to the steel industry, from entertainment to philosophy.

Amid the brewing of a world slump only the Wenlock Institutes prospered. There one could enrol for moderately expensive courses to be taught the Wenlock discipline that unlocked the ancient bars of the mind. There one could purchase the moderately expensive drugs that helped one on one's way to the plesiosaur-haunted seas. And at the mind-stations, Wenlock-owned, one could keep a moderately expensive anchorage in the world of passing time while one disappeared —for ever, if the cash held out.

Like other human systems, the Wenlock system, although as humanitarian as its founder, was fallible. In many countries, it was denounced as a dangerous monopoly; in others, it came at once under the direction of the government. And, of course, less well-meaning persons ferreted out the secrets of its disciplines and drugs, and put their own versions on the market. Many a refrigerator in many an empty apartment held dishes of blood and tissue culture while the absconding family played hookey in Gondwanaland.

Within the Wenlock empire, too, all was not well. An article in "Dental World" for January of the previous year entitled "The Discipline and Dental Pay" first brought the name of Norman Silverstone to Bush's attention, and then he came across it again in one or two of the other tattered magazines. As a commentator pointed out, the whole theory of mind-travel rested on few facts and a mass of supposition, rather as the theories of the psycho-analyst Sigmund Freud had at the end of the nineteenth and the first half of the twentieth century. Silversone played Jung to Wenlock's Freud. Although nobody could deny the fact of mind-travel, there were several who denied that Wenlock's was the correct interpretation of what it was. Most powerful among these was Wenlock's one-time friend and associate, Silverstone. Silverstone maintained that the human mind could certainly be freed from the psychotic barrier behind which it had built its time-locked supremacy over the rest of the animal kingdom; but he claimed that there were yet more extraordinary powers to be released, and that the limitations of mind-travel, debarring most human travellers from most of historic time, was evidence of the fact that the discipline was but a fragment—probably a distorted fragment—of a greater whole.

Silverstone was of a retiring disposition, a man who refused to be interviewed or photographed, and his contributions to the dispute were so abstruse, that it could hardly be said that he constituted a too formidable opposition to Wenlock. Nevertheless, he and his followers provided an instrument that proved useful to governments wanting to have a hand in the administration of the local institute and mind-stations.

For obvious reasons, the supply of antique magazines stopped at the time of the revolution, but Bush thought he could see clearly enough the ensuing train of events. In most countries, the severe slump conditions would be accentuated by stock market crashes; unemployed men would march on the capital; the half-starved would riot; tougher governments would be called for, by haves and have-nots, although for different reasons. He sat in the untidy room, inventing discomforts.

The unsettled conditions would not last. The nations would recover, as they had recovered before. He already had a sign that General Bolt's regime might be of limited duration—almost a mystical sign, although at the time it had gone almost unheeded. When he was standing in Room 3 locked in a sort of fit and waiting for the summons before Franklin, the Dark Woman had appeared. At the time, his mind had been too preoccupied for this visitant from the future to register fully with him. But he realised now that, shadowy as she was, she had glowed slightly, for all the world like a phantom in the mock-Victorian pageants his mother had taken him to as a boy. It could mean only one thing: that in her age, she was standing in the open; in other words the Institute was demolished in her day; which argued that the General's protective wing would not always be there. Not always, but his phantom watcher might be five hundred years ahead, which was a long time. Well, there was hope. The most dreadful things passed.

He looked round the waiting room. She was not with him at present. However faithful she was, she had to have some time off duty. Then he thought: Or is she a figment of my imagination, my anima? Aren't I radically unbalanced, by turns cowardly and over-bold, under-sexed and sex-obsessed? Maybe the Dark Woman is just a projection of my dissociated personality.

But she was more than that. She was the future, for its own reasons keeping an eye on him. The future was everywhere in his age, as if they would dam his generation in and repel its angry wave so that the flood of discontent flowed away from it, leaving it olympian and safe! They had discovered a way of moving among the ages of man.

BUSH TRIED TO speculate about the future, gave up, and slipped out of the house for a walk. He could not reason constructively since he had been placed under Franklin's training orders. His life was about to

be turned upside down. Indeed, he hardly understood what was going on. In the nights he thought be heard his mother's voice.

He tried to think about Ann but she seemed as remote as the Devonian in which he had found her. He tried to think about his father, but there was nothing new to think. He thought about Mrs. Annivale, whom he had now met, but that made him uncomfortable. Mrs. Annivale was not half as horrible as he had pictured her. She was, he judged, no more than his own age and still had something of youth about her. She smiled pleasantly, was friendly and natural, seemed genuinely to like his father, and her mind did not seem too entirely banal. But she was no business of his.

He turned back. There was nowhere he wanted to go to, and the dirty empty streets repelled him. He recalled that in his wrecked studio there was a box of clay he used for modelling; perhaps he could interest himself with that, although every spark of inspiration felt dead.

When the lump he was moulding into shape began to resemble Franklin's head, he gave up and went indoors.

"Had a pleasant day?" Mrs. Annivale asked, coming downstairs.

"Just great! We went over to see mother's grave this morning and this afternoon I've had a good read of some two-year-old magazines."

She looked at him and grinned. "You talk quite a bit like your Dad. He's asleep, by the way—I shouldn't wake him. I'm just going round to my place to get my grater; I'm going to make you a cheese pud tonight. Why don't you come round with me? You haven't seen my place yet."

Moodily, he went with her. Her house was bright and clean and seemed to contain very little furniture. In the kitchen, Bush asked, "Why don't you move in with father and save rent and everything, Mrs. Annivale?"

"Why don't you call me Judy?"

"Because I didn't know it was your name. Father always calls you Mrs. Annivale to me."

"Formal! I hope you and I don't have to be formal, do we?" She was standing idly near him, looking at him, showing her teeth a little.

"I asked you why you didn't move in with my father."

"Suppose I said I fancied younger men?" There was no mistaking the tone in her voice or the look in her eye. Everything was convenient, he told himself. Her bed would be clean, his father was asleep next door, she knew he was off next week. Unbidden, his betraying body told him it liked the idea.

Hastily, he turned from her. "Then that's jolly sweet of you to look after him, Judy."

"Look, Ted—"

"Got the cheese grater? We'd better go and see if he's okay." He led the way back, feeling a fool; so evidently did she, judging by the way she chattered. But after all . . . well, it would have been like incest. There were some things you had to draw the line at, however much of a moral wreck you were!

ALTHOUGH SUCH WAS not the case, Judy Annivale seemed to imagine she had offended Bush and was tiringly pleasant to him. Once or twice, he had to take refuge in his studio with the half-formed bust of Franklin. And on the day the truck was due to come for him, she followed him down into the studio.

"Beat it!" he said. He saw death in the lines round her mouth.

"Don't be unsociable, Ted! I wanted to see what you were doing in the art line. I used to think I was artistic once."

"If you want to play with my clay, go ahead, but just don't follow me around! Are you trying to be a mother to me or something?"

"Do you really think I've been showing you signs of motherliness, Ted?"

He shrugged his shoulders. He had no morals. Maybe he was passing up a good opportunity that tomorrow would see lost for ever.

James Bush thrust his head inside the shed.

"So this is where you've both got to?"

"I was just saying how much I admired Ted's artistic talents, Jim. I used to be a bit artistic myself once, as a girl. I'm sure all the wide perspectives of the past that you've travelled must have helped a lot."

Perhaps a whisper of suspicion passed over James Bush's brain. In irritation, he said, "Nonsense, the boy's seen next to nothing! You're like most folk—you don't seem to realise how ancient the Earth is and how little of its past is accessible even to mind-travellers."

"Oh, not that clock analogy, father!" Bush had heard this set-piece before.

But his father was covering the exit. Painstakingly, he explained a standard textbook diagram to Judy, a diagram in which it was supposed that the Earth was created at midnight. Then followed long hours of darkness with no life, the time of fire and an alien atmosphere and long rains, the Pre-Cambrian times or Cryptozoic Era, of which little was known or could be known. The Cambrian period marked the beginning of the fossil record and did not arrive till ten o'clock on the clock face. The big reptiles and amphibians put in an appearance with the Carboniferous period at about eleven o'clock, and were gone by quarter to twelve. Mankind's appearance was made at twelve seconds to noon, and the time since the stone age was a fraction of a second.

"That's what I mean about perspectives!" Judy said gamely.

"You perhaps miss the point, my dear. All those grand millions of years the mind-travellers make so free with in their conversation are but the last ten minutes on the dial. Man is a small thing, his little life is not only ended but begun with a sleep."

"The clock analogy is misleading," Bush said. "It

doesn't leave room for the immense future, many times all that's past. You think your clock puts everything in perspective but really it ruins it."

"Well, we can't see the future, can we?"

The question was unassailable, at least for a little while.

Chapter Seven:

The Squad

THE TRUCK DELIVERED Bush at the training centre at 10.30 in the morning. By midday, his civilian clothes had been taken from him, to be replaced by a coarse khaki uniform; his head had been shaved; he had plunged through a cold disinfectant bath; been inoculated against typhoid, cholera and tetanus and vaccinated against smallpox; been examined to see that he was not suffering from a venereal disease; had his voice- and retina-patterns taken and his finger-prints recorded; and paraded at the cookhouse for an ill-cooked meal.

The course proper began at 1300 hours sharp, and from then until the end of the month was almost unremitting.

Bush was put in Ten Squad, under a Sergeant Pond. Pond drove men through a succession of difficult or impossible tasks. They had to learn to march and even run in step. They had to learn to respond to orders given a quarter of a mile away by the human voice, if such a designation was seemly for Sergeant Pond's noises, shouting at its most ragged and repulsive pitch. They had to learn to climb brick walls and to fall from upper storey windows; they had to learn to climb ropes and to wade through stagnant pools; they had to learn how to dig meaninglessly deep holes and strangle their fellow men; to shoot and stab and swear and sweat and eat garbage and sleep like dead men. To begin with, a sardonic part of Bush's brain amused itself by standing apart and watching his actions. Now and again, it would come forward and say, "The object of this exercise is to make you less an individual, more a machine for taking orders. If you cross this rope bridge without falling on the rocks below, you will be less human than you were before you attempted it. Gobble down this bit of sea-lion pie and you will be even less of an artist than you were yesterday." But the sardonic part of Bush's brain was soon anaesthetised by constant meaningless activity. He was too tired and bemused for criticism to flourish, and the harsh roar of Pond's voice supplanted the whisper of his intelligence.

Nevertheless, he was alert enough to notice the activities of some of his fellow recruits. Most of them, the great majority, accepted and suffered as he did, putting their private selves away, as it were, the better to endure. There were also two small minorities; one consisted of those unfortunates who could not put away their private selves. They got on parade late with their boots dusty; they could not eat the food; they turned left when the rest turned right; they half-drowned in the scummy ponds; sometimes, they wept instead of sleeping at night.

The other small minority called themselves "The Tripeshop Troopers". They were the ones who enjoyed Sergeant Pond's insults, who relished the degradations of the barrack square, who were born for stabbing sawdust dummies. And in their spare time, they drank wildly, beat up the members of the other minority, vomited unexpectedly on the floor, sucked up to Pond and generally behaved like heroes.

They also gave the squad its backbone and spirit, and Bush wondered afterwards if he would have got through the course without his desire to prove himself as good and tough as they.

He did best, and outshone the rest of the course, only on the firing range, where the squad frittered away every Monday and Thursday morning in draughty surroundings. Here, they learned to fire light-guns, which might (or more probably might not) become standard items of their equipment later. The light-guns fired pulsed beams of coherent light and could burn a neat little black hole right through a man at half-a-mile. But it was less the killing potentialities of the weapon than its artistic side that attracted Bush. This slender metal barrel dealt with the basic substance of all painters, light: ordered it, organised it; the ruby laser it contained spat out light in milliseconds' worths, delivering it in parallel, monochrome beams on to target. As Bush burned out his bull's-eyes, he felt he was indulging in the only artistic pursuit left to a man in time of emergency.

AMONG ALL THE marching, chasing and mock-fights to which Ten Squad was subjected, lectures were given on various subjects. The squad then sat on benches in blessed momentary peace, and Bush sometimes snatched these periods to wonder what the object of the course was.

Clearly, it had been cobbled quickly together from other established military courses, but he could not see that it had much connection with his future as an agent which had been mapped out for him. He appreciated that he was being systematically degraded, and perhaps more effectively than the Tripeshop Troopers, who gloatingly took all the punishment meted out. He just failed to see its purpose; and then he realised what all this would mean to the undermind; knowing its own worth, it would be shamed and defeated, and would die more easily when ordered to.

But that was nonsense, because. . . . Their duty was not to die. The hatred Sergeant Pond injected into them for twelve hours a day was to help them suffer, not die. The undermind was being fed poison—and nobody was protesting! They must be mad. And this conspiracy was no freak of General Bolt's regime; it was ubiquitous, eternal. Men had always poisoned themselves in this way, making themselves coarse of habit, dim of wit, void of individuality. As an artist, he had always been alone. Now for the first time, he was surrounded by his fellow men, and he saw into them. They had windows in their chests. There was something

moving in there, peering out through the windows; the windows were misty, steamed over by the breath as it was sucked in among the sponges of the lungs; it was hard to see. One of the things inside was writing on the window with a finger. It was a message for help, something explaining the sanity of all mankind, but not only were the letters back to front, they ran in the wrong direction. Bush was on the verge of deciphering the words when—

His name was called, and he sat up abruptly.

His name was called, and he had been asleep!

"Bush, you have ten seconds to answer the question." A red-faced officer, one Captain Stanhope, stood by the blackboard, glaring at Bush. The rest of the squad had turned to stare and the Troopers were grinning and nudging each other. "The carotid vein!" one whispered across at Bush.

"The carotid vein, sir," Bush said, clutching at a straw.

The squad rocked with laughter. The Troopers nearly fell on to the floor in their delight.

Stanhope barked for silence. When the squad had been reduced to silence, he said, "All right, Bush, I asked you what carrots were good for. You tried to be funny. I'll deal with you afterwards."

Bush directed a glare of hatred at the hearties.

He marched up to the captain afterwards, as the rest of the squad were clattering out, and stood rigidly at attention till the officer deigned to notice him.

"You were trying to be funny at my expense."

"No, sir. I was asleep."

"Asleep! What do you mean, asleep, when I was talking?"

"I'm exhausted, sir. There's too much running around on this course."

"What were you in pre-revolutionary days?"

"Artist, sir. I did groupages and that sort of thing."

"Oh. What's your name?"

"Bush, sir."

"I know that. Your full name, man."

"Edward Bush."

"Then I know your work." Stanhope softened slightly. "I used to be an architect before the need for architecture disappeared. I admired some of the things you did. Liked your groupages, especially the one you did for Southall station, and I liked your earlier paintings. I have—had—a book on your work, with illustrations."

"The one by Branquier?"

"That's the name, Branquier. Well, I'm happy to meet you, though hardly in these surroundings and conditions. You're an expert mind-traveller, too, I hear."

"I've been doing it a long time."

"You shouldn't be on a course like this! Weren't you picked for minding by Wenlock himself?"

"That may be partly why I'm here."

"Mm. I see. What do you think of this Wenlock-Silverstone controversy? Don't you feel that the Wenlock orthodoxy may well be a myth, and that Silverstone in fact has a great deal to offer if his side of the matter were not distorted? So many suppositions have been taken for facts, haven't they?"

"I don't know, sir. I know nothing about it."

Stanhope smiled. "They've gone now. You can speak freely to me. Quite honestly, the regime are all wrong in hunting Silverstone, aren't they? Don't you think?"

"As I said, sir, it's a tough course. I can't think any more. I have no opinions."

"But as an artist, on a vital matter like Silverstone, you must have very strong opinions."

"No, none, sir. Blisters on feet and hands, sir; no opinions."

Stanhope drew himself up. "Bush, dismiss—and next time I catch you dozing in my lectures, you'll be in bad trouble."

Bush marched away, solid and flat-footed. Inwardly, he laughed and sang. The bastards weren't going to catch him that easily!

But he wondered very much about the news that the regime was hunting Silverstone. It sounded authentic. And why should they be sounding out *his* views on the subject?

AT THAT TIME, he had only two weeks to run before he found out, but those two weeks dragged on interminably as the course went its pointless way. Being anti-social, Bush found barrack-room life no pleasanter when it became clear that his brush with Stanhope had made him something of a favourite with the Troopers.

"What ho, mate! How's the old carrots going down?" they would call, with oafish good-humour, never tired of his lewd answer.

At last, the final straw dummy had been stabbed, the last illiterate talk on seeing without being seen listened to, the last mile run. Ten Squad paraded for its final tests, followed by personal interviews, alone in the shabby lecture huts with two officers.

Bush found himself with a bald-headed man, Captain Howes, and Captain Stanhope.

"You can sit down," Stanhope said. "We are going to ask you a series of questions, just to test your knowledge and reaction speed. What is wrong with this sentence: 'Nature and nature's laws lay hid in night. God said let Newton be and all was light'?"

"It's an accurate quote from some poet or other—Pope? But it isn't true. There's no God, and Newton didn't illuminate as much as his generation supposed."

"What's wrong with this sentence: 'The regime are mistaken in persecuting Silverstone'?"

"Collective noun should be followed by singular verb."

Stanhope scowled. "What else?"

"I don't know."

"Why not?"

"What regime? What Silverstone? I don't know."

"Next question." They went on through a maze of trivia, the captains taking it in turn to interrogate, sitting

staring moodily at Bush while they were resting. At last the farce came to an end.

Captain Howes cleared his throat and said, "Cadet Edward Bush, we are pleased to say that you have passed your test. We allot you a score of about eighty-nine per cent, with the rider that you have an unstable personality, peculiarly suited to mind-travel. We hope to send you on a special mission into the past within a few days."

"What sort of a mission?"

Howes laughed unconvincingly. He was a big man, not ill-looking, who seemed more in control that Stanhope. "Come, you've had enough for today! Relax, Bush! The course is over. Captain Stanhope and I will see you back here tomorrow morning at nine-thirty, to give you full briefing. Till then, you can go away and celebrate."

He bent down and pulled a bottle out of the drawer of the desk, handing it solemnly over to Bush. "Don't imagine the regime has no time for fun, Bush, or no sense of the better things in life. Go and enjoy yourself and accept this gift with the compliments of the officers of the course."

WHEN THEY HAD gone, Bush examined the bottle of drink with some curiosity. It had a big tartan label and was called "Black Wombat Special: Genuine South Indian Rice Whisky, Brewed in Madras from a Forbidden Recipe". He flipped up the metal cap and sniffed cautiously. He shivered.

Tucking the bottle inside his tunic he took it back to the barrack room.

The Tripeshop Troopers were already celebrating the end of the course, drinking vile resinous drinks out of tin mugs. They greeted Bush with a cheer and arch references to the carotid vein. Destined to begin life anew as members of the newly-formed mind-travel police, working in mufti, they had a week's leave coming to them on the morrow. They were vowing to spend the whole leave drunk.

Bush presented them with the Forbidden Recipe Whisky. As he sat down with them, he found Sergeant Pond was among them, Pond whose kindest word in the last month had been to damn them for a ruddy herd of ruptured bleeding camels, Pond who had bayed at them like a bloodhound and worried them like a terrier.

Pond put his arm about Bush. "You been my besh squad you boys! What'm I going to do without you? Another ruddy shower of recruits in tomorrow, needing their noshesh wiped all the time. You're my frien's!"

Gritting his teeth, Bush poured some Forbidden Recipe on top of the brown liquid already in Pond's mug.

"Yer my besh frien', Bush," the sergeant sard. His maltreated voice, grinding along in low gear could hardly be heard for the band now starting up, as some of the brighter or more stupid lads began to whistle and shout and sing and beat a crude rhythm out on waste bins, mess tins and other instruments. Bracing himself, Bush took a swig at the Black Wombat, and was instantly three parts drunk.

Four hours later, almost every man in the barrack room was in a sodden stupor. Pond had staggered away into the night, the squaddies had either fallen into bed or been thrown there by hearty companions. One man stood alone at the far end of the room by a window flung wide, still clutching a bottle, and singing a lewd song.

". . . But the way he caught the butler
"Was the dirtiest way of all. . . ."

Finally there was silence, and darkness. Bush lay on his bed, wakeful under a feeling of terror that had an illusive familiarity about it.

"I'm not dying, am I?" he whispered. He could hear voices. There seemed to be four men round his bed, two in white coats, two in black. One of them said, "He can't understand a thing you say; it's all turned to his own needs. He imagines himself in another place, perhaps another time. Isn't he a committed insect?"

The thought of insects goaded Bush into sitting upright. The gaunt bleak room full of insensible bodies stretched away in all directions. The four men still stood at his bedside. Humouring his fantasy, he said, "Where do you felons think I am?"

"Quietly!" one of the phantoms admonished. "You'll wake the others in the wardrobe. You're suffering from anoxia, with ordinary hallucinations."

"But the window's open," he protested. "Where is this, anyway?"

"The Carlfield Mental Hospital. We are looking after you; we believe you are an amniote egg."

"Your meeting's scrambled," he said. He sank down again, overwhelmed by sensations of drunkenness and futility. These men could do nothing for him or to him. On his pillow, a yawning pit of sleep awaited him.

HE MADE IT to the lecture hut on time next morning, despite a throbbing head. Howes and Stanhope arrived in a few minutes. They were in civilian clothes. The course was over—until the next one began. In the square, the disbanded Ten Squad were moving about in unfamiliar clothes, heading away from home or duty, bawling final ribaldries at each other.

The officers sat down on the bench next to Bush, and Stanhope began to talk in a business-like way.

"We know you will be honoured by the mission the government has in mind for you. However, before we tell you what it is, we feel it necessary to give you some of the wider background.

"This is a time of great uncertainty, nationally and internationally, as you are by now aware. The new theory of time has upset the status quo. This is particularly so in the West—America and Europe, which have for historic reasons always been very time-conscious areas. In the East, things are much as they ever were. Duration means a different thing to a Chinaman or Indian than it does to us.

"General Peregrine Bolt had to step in and take over

because this country of ours was on the brink of economic ruin. A strong hand is going to be needed for a long while, until we adjust to the new conditions—meanwhile, we are in the paradoxical position of having to accept aid from the East."

Bush's aching head prompted him to say, "Hence the Black Wombat Special, I suppose."

He observed that Stanhope looked blank, whereas Howes caught the reference.

"You will see that it is imperative that no *new* disruptions come along to upset the order we are trying to build."

"What sort of disruptions do you mean?"

Stanhope looked embarrassed. Howes said, "Ideas are sometimes worse than armed uprisings. As an intellectual, you should know that."

"I'm not an intellectual."

"I'm sorry. Suppose a conflicting idea should now arise about the nature of time? It might throw us back to where we were a few months ago."

Understanding began to creep over Bush. These two men seemed so harmless, so *marginal* (and Stanhope was really not particularly bright); but they were sitting here like two evil uncles at a sick child's bedside, telling him bad fairy stories—stories that might reveal the whole secret of . . . of the regime's, and consequently Bolt's, fears; of the neuroses of the age. . . . It was something in Howes' face that prompted this feeling; he was being as frank as he dared, he was also hiding something: the classic dilemma of an intelligent man in a totalitarian society.

Howes told Bush, "It's the question of time, you see. All that man is, all that he has built—although, as Captain Stanhope says, this is more true of the West than the East—has been founded on the idea that time is unidirectional: like the flow of water through a sluice gate, shall we say? But this was man's invented idea, and the little he knew of the truth he kept suppressed down in the dark basements of his being, the undermind, as we call it. Occasionally, intimations of the truth have leaked through, to frighten him. Precognitive experiences or dreams, extra-sensory perceptions, the sense of *deja vu*, and so on—almost anything that could ever be dismissed as magical or superstitious—were such leakages and directly contradicted the precious theory of unidirectional time. Which was why they were so passionately laughed out of court."

"And your alternative to unidirectional time?"

"Co-continuous time. You know that. You believe it. You went through the Wenlock Discipline. Space-time being what it is, past and present are at par in terms of energy. Imagine a featureless world without day or night or organic processes: we'd have no basis there for any concept of time, even an incorrect one like unidirectionalism, because there would be no way of establishing time differences from a human point of view. The error, the very concept of time-flow, is in the human consciousness, not in the external universe: the creed that causes us to speak of mind-travel rather than time-travel, as some would originally have preferred.

"Such is Wenlock's discovery and it gives us something to work on. Any other rival theories must be squashed, in case they throw us back into chaos again."

"And I take it there are rival theories?"

He knew what was coming even before Stanhope answered (this was Stanhope's domain, the world of security, so much simpler than the realm of speculation): "You know there are rival theories. The renegade Silverstone, once a colleague of Wenlock's, is uttering dangerous and misleading nonsense."

"Heresy, eh?"

"Don't joke, Bush. Not heresy but treason. Silverstone is guilty of treason by uttering ideas calculated to upset the security of the state. He must be eliminated."

Bush guessed what came next. The madmen who visited him in the night could have guessed. By the very nature of his thinking, Silverstone would be an accomplished mind-traveller. The regime would require another such to go and eradicate him—and Bush was another such.

Howes must have read Bush's expression, for he said, "That is your mission, Bush, and I hope you prove worthy of the honour. You have to hunt down Silverstone and kill him. We know he is somewhere at large in time, probably under an assumed name; we shall give you every assistance."

Snapping open the case he was nursing, he produced a bulky file and held it out to Bush.

"You are going to be given forty-eight hours' leave and then you will be equipped and required to mind-travel until you find the traitor Silverstone. We shall see that your father is provided for; he will appreciate the Black Wombat. You will study these documents and make yourself familiar with Silverstone's case in every way possible . . . except that of inflicting on yourself the man's treasonable theories."

Catching an edge of irony in Howes' voice, Bush glanced up, but the officer stared at him blank-faced, and Bush dropped his gaze to the dossier. On the top of it lay a photograph of Silverstone, one of the rare ones. It showed a man with long straggly white hair and an untidy grey moustache. His nose was long and curved. Although his eyes in the photo were serious and abstracted, a half-smile lurked about the lips. When Bush had last seen him, his hair had been cut and dyed and his moustache shaved off; but he had no difficulty in recognising Stein.

"I'll see what I can do, gentleman," he said. "I shall enjoy the assignment."

The captains rose and shook his hand.

(To be concluded)

THE -TERROR- •pleasure• PARADOX

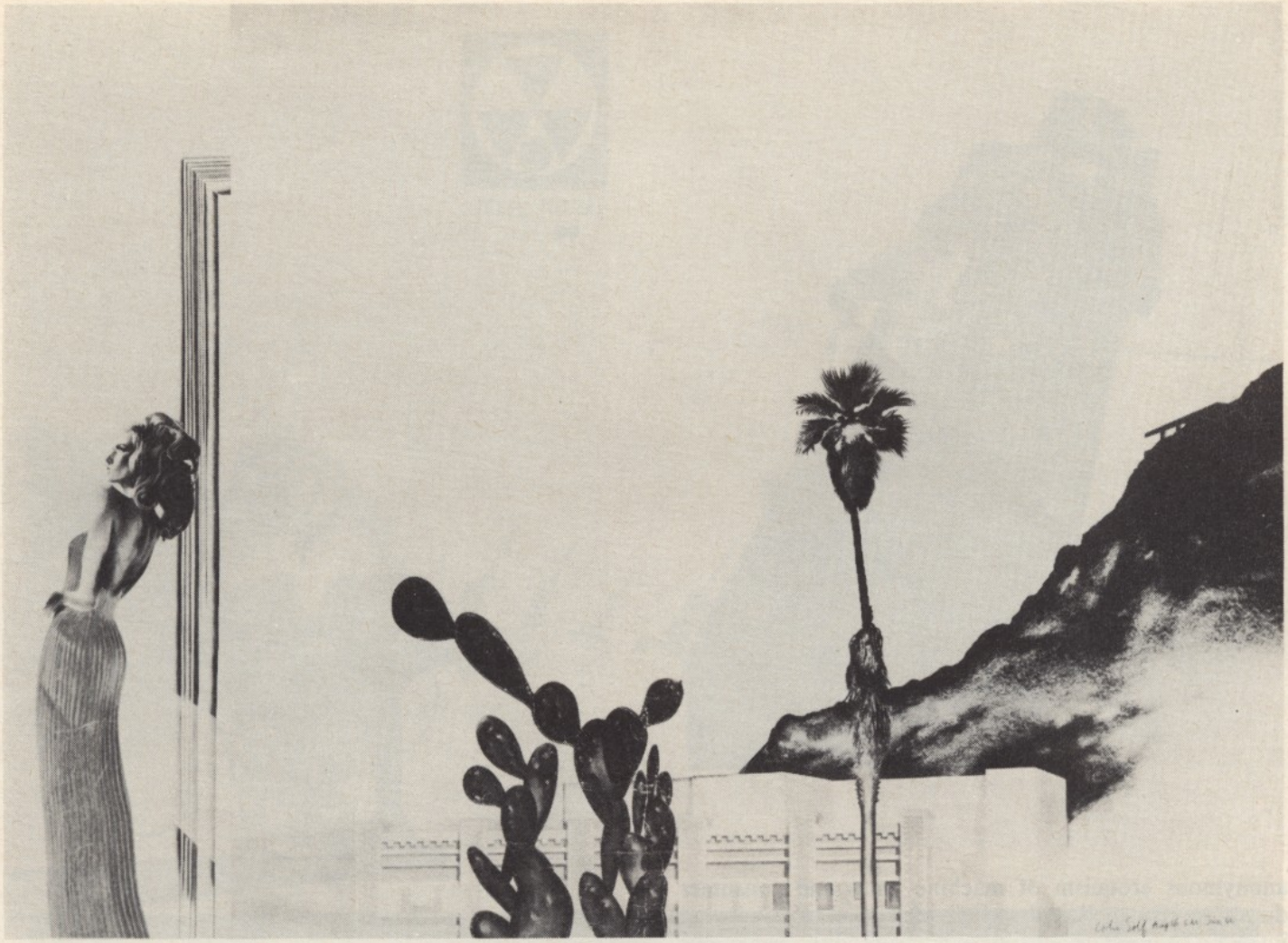
Christopher Finch

Pacific Pallisades. The clean lines of a modern villa (school of Richard Neutra) are seen in silhouette, high on a rocky promontory which slopes towards the sea where spray whipped off the breakers mingles with the Southern California smog. Nearer—through the motel window—can be seen a low building (its architect has made a gesture towards Mexican vernacular), partially hidden by cactus and a scrawny palm tree. By a high doorway a girl waits—elegant in a long evening dress. Her hairstyle represents the labour of love (or some related sentiment) and its sheer mass seems responsible for the curious curve of her torso. A bar of sunlight cuts across her.

East Anglia, Gleaming rows of missiles. In the foreground an alsatian—hair bristling—displays its fangs in a vicious snarl.

The two drawings described above may be taken as representing the complementary poles of Colin Self's work. Self is a young English artist who has exhibited successfully in London and Paris. His style may be described as selective naturalism. He speaks of selecting events and objects which are in themselves natural but which, when put together, react in such a way as to produce results which are not quite natural.

Self's chief concern is the paradoxes of terror and pleasure, which he sees as typical of the modern world. He is deeply involved with the way that people adjust to new environments and how our culture incorporates crisis into its behaviour patterns. In his own words: "Cars (and other manufactured products) of a nation reveal many of the characteristics of that nation. Because people have adjusted to pessimistic events, leisure seems to have forced the upper hand at the moment. Reflected to me in 'classic lines' and bright new colours of many new cars, etc. Most people appear to have forced fear of warfare from their everyday existence by developing a greed for these comforts. Again this is happening in a more extreme way in the U.S. and can be seen more easily there." In Self's drawings these insights are sublimated by the objectivity of his technique but become, in consequence, all the more potent. If handled clumsily they might seem banal; treated



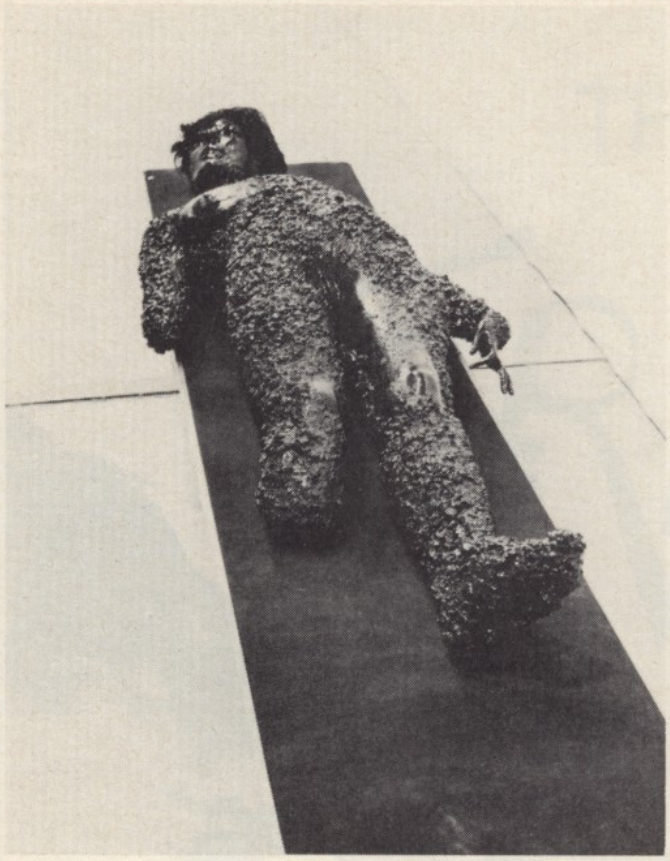
with the degree of technical detachment that he brings to them they become fused with our perception of reality and take on a frightening validity.

In one drawing—a cinema interior—the screen is occupied by three heavies engaged in the aftermath of an act of violence while in the auditorium we see two young women totally detached from this event, presumably enjoying an evening out. Mishandled this might have become a parable but Self's objectivity and selectivity elevate it to quite another level of experience.

Self speaks of his interests and inverted interests: "In weapons, warfare, broken laws and other causes of degeneration; entertainments, acts and escapisms which people then seemed forced to invent to counteract the former. An example is the development and installation of H. Bomber and missile bases in the last decade. Intense fear—knife-edge living of the 50s. During this same period TV was popularised. A more perfect tranquiliser couldn't have been invented. A hypnotic kind of brain masturbator (sometimes backfiring, spouting nuclear news)."

When Self portrays the paraphernalia of nuclear strategy—bombers, interceptors, guard-dogs snarling outside nuclear installations—he is not indulging in naïve propaganda. He is presenting one side of the balance of terror and pleasure which, he suggests, defines the character of our age. The balance (or paradox) is crystallised in his series of fallout shelter drawings: a stripper lurches forwards into a simian pose, breasts drawn floorwards by their own mass and the twin vortices of diamante-studded nipples/a grotesque middle-aged nude enjoys the synthetic ecstacy of a mechanical slimming belt/a girl with stupendous hair and eyelashes pulls a tumescent hot-dog towards her mouth while more sausages revolve on the spokes of an elegant grill. And, as a background to all these leisure activities, appears the leitmotif of the fallout shelter sign. The paradox is established. No overt moral is drawn but the fact is stated.

It is natural that Self should be interested in the exploitation of eroticism in advertising art but he is still more interested in the unconsicous or semi-conscious parallels of this phenomenon; the totally



Robert Fraser gallery.

anonymous eroticism of machine parts and consumer durables. His explicit drawings of automobiles, cinema interiors or chesterfield settees sum up whole behaviour patterns. His immaculate technique makes him admirably suited for this task.

On this subject he remarks: "'Beautiful technique' (as it has been called) of my drawing is, I think, near to sarcasm. It is meant to be overloving to the point of becoming vulgar. Like a still sexually receptive widow caring for her pet dog. Like going to a hunt ball and speaking their accent in order to ridicule. What happened with the drawings, though, was like having other guests turn, saying 'He speaks so well, so beautifully'."

Self's other field of activity is sculpture. The range of subject matter here is related to that of the drawings (Victor bombers to hot-dogs). His two most recent pieces are concerned with terror themes. One—a female victim of a nuclear attack—could scarcely be more direct. The limbs of the black, naked body are mutilated—the tissues dissolving into an efflorescence of glistening crystals. The head and one breast (cast, ironically, from life) remain untouched and their extreme naturalism prevents the spectator from escaping into aesthetic quarantine.

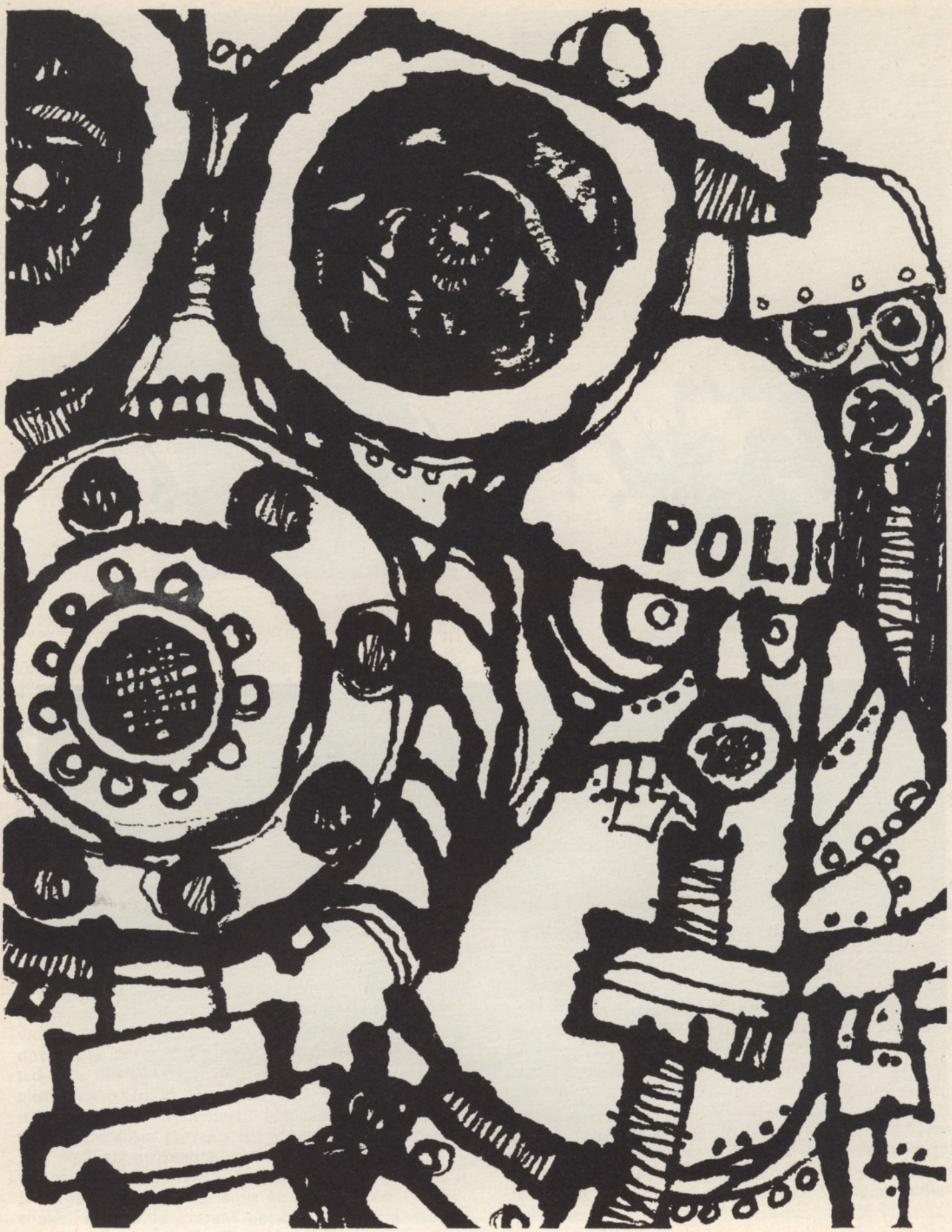
The corpse has a visual fascination which prevents it from being taken as a simple gesture of protest. It becomes, instead, a surreal object implying a wholly surreal climate.

The other piece—a diorama representation of one of Self's central themes (a dog guarding a nuclear installation)—presents us with a segment of this climate. Inside a large, tumescent cabinet—reminiscent of a barrage balloon—a stuffed guard dog snarls amongst barbed wire and perimeter vegetation. Behind the animal, missiles rear from the base of the cabinet. The whole panorama is sprayed black (the dog's yellow eyes glow in this pitch landscape) and is illuminated by red and white spotlights.

In the climate of evasion that exists today Colin Self's work is not easy to take. He speaks of art being a parasite. "All the greatest art is firmly attached to and reflective of the great religions, political and scientific developments (or the misemployment of these developments)." If we accept his paradox of terror and pleasure, where do we place art? There is, I think, a tacit acceptance of the notion that art belongs to the pleasure side of the balance. In Self's work we see a serious effort to transcend the paradox; an attempt to make art central once more.

Robert Fraser gallery.

Robert Fraser gallery.


POLI

stand on ZANZIBAR

john brunner

(John Brunner's new novel, *Stand on Zanzibar*, to be published next year by Doubleday, is possibly the longest sf novel ever written, totalling no less than a quarter of a million words. We should have liked to have serialised it if we had not realised that it would run to fifteen well-sized episodes. Therefore we have extracted several parts, which, we feel, give a good idea of the realistic future world Mr. Brunner has created. The novel uses techniques borrowed chiefly from Dos Passos, but employed for the first time to do something which, we feel, has never properly been achieved in sf before – the creation, in every detail, of a possible society of the future.)

Continuity (3)
After One Decade

EMERGING FROM the library, Donald Hogan looked first north, then south, along Fifth Avenue, debating which of half a dozen nearby restaurants he should go to for lunch. The decision seemed unreachable for a moment. He had been holding down his present job for ten years, almost; sooner or later he was bound to go stale.

Perhaps one shouldn't have one's greatest ambition realised in full at the age of twenty-four. . . ?

He had, very probably, another fifty years to go; he had a calculable chance of a decade beyond that. And when he accepted the offer they'd made him he hadn't raised the matter of retirement, or even resignation.

Oh, they'd have to let him retire eventually. But he had no idea whether he'd be permitted to resign.

Lately, several of his acquaintances—he made a policy of not having friends—had noticed that he was looking older than his age, and had developed a tendency to lapse into brown studies. They had wondered what on earth could be the matter with him. But if someone had been in a position to say, "Donald's wondering if he can quit his job," even the most intimate of all those acquaintances, the man with whom he shared an apartment and an endless string of shiggies, would have looked blank.

"Job? What job? Donald doesn't work. He's a self-employed dilettante!"

Approximately five people, and a Washington computer, knew otherwise.

"SIT DOWN, Donald," the Dean said, waving an elegant hand. Donald complied, his attention on the stranger who was also present: a woman of early middle-age possessed of delicate bone-structure, good taste in clothes and a warm smile.

He was a trifle nervous. In the last issue of the university's journal he had published some remarks which he later regretted making public, though if pressed honesty would compel him to admit that he had meant them and still did mean them.

"This is Dr. Jean Foden," the Dean said. "From Washington."

The alarming possibility of having his post-graduate grant discontinued on the grounds that he was an ungrateful subversive loomed up in Donald's mind. He gave the visitor a chilly and rather insincere nod.

"Well, I'll leave you to get on with it, then," the Dean said, rising. That confused Donald even more. He would have expected the old bastard to want to sit in on the discussion and giggle silently—here's one more intransigent pupil up for the axe. His mind was therefore barren of possible reasons for summoning him when Dr. Foden produced and displayed the student journal in question.

"I was very struck by the article of yours in here," she said briskly. "You feel there's something wrong with our teaching methods, don't you, Don? Mind if I call you Don?"

"Not if you don't mind my calling you Jean," Donald said in a sullen tone.

Musing, she looked him over. Four-fifths of the contemporary population of North America counted as handsome or beautiful; balanced diet and adequate

inexpensive medical care had finally seen to that. And now that the first eugenic legislation was beginning to bite, the proportion was liable to increase. Nonetheless, there was something out of the ordinary about Donald Hogan. His women usually said it was "character". Once an English exchange student had told him it was "bloody-mindedness", and he had accepted the term as a compliment.

He had brown hair and beard, he was a little below average height, he was well-muscled, he wore the typical clothes of a turn-of-the-century student. Externally, then, he conformed. But somewhere underneath. . . .

Dr. Foden said, "I'd like to hear your views."

"They're on the page for you to read."

"Re-phrase them for me. Seeing something in print often helps one to make a fresh assessment."

Donald hesitated. "I haven't changed my mind, if that's what you're getting at," he said at length. The stench and crackle of burning boats was vivid to him.

"I'm not asking for that. I'm asking for maximum concision instead of this—this rather rambling complaint."

"All right. My education has turned me, and practically everyone else I know, into an efficient examination-passing machine. I wouldn't know how to be original outside the limited field of my own speciality, and the only reason I can make that an exception is that apparently most of my predecessors have been even more blinkered than I am. I know a thousand per cent more about evolution than Darwin did, that's taken for granted. But where between now and the day I die is there room for me to do something that's *mine* and not a gloss on someone else's work? Sure, when I get my doctorate the spiel that comes with it will include something about presenting a quote original unquote thesis, but what it'll mean is the words are in a different order from last time!"

"You have a fairly high opinion of your own ability," Dr. Foden commented.

"You mean I sound conceited? I guess I probably do. But what I'm trying to say is I don't want to take credit for being massively ignorant. You see—"

"What are you going to do for a career?"

Diverted from his orbit, Donald blinked. "Well, something which uses up a minimum of my time, I imagine. So I can use the rest to mortar up the gaps in my education."

"Ah-hah. Interested in a salary of fifty thousand per to do—essentially—nothing *but* complete your education?"

There was one talent Donald Hogan did possess which the majority of people didn't; the gift of making right guesses. Some mechanism at the back of his mind seemed ceaselessly to be shifting around factors from the surrounding world, hunting for patterns in them, and when such a pattern arose a silent bell would ring inside his skull.

Factors: Washington, the absence of the Dean, the offer of a salary competitive with what he could hope to earn in industry, but for studying, not for working. . . . There were people, extremely top people, whom specialists tended to refer to disparagingly as dilettanti but who dignified themselves with the title "synthesists", and who spent their entire working lives doing nothing but making cross-references from one enclosed corner of research to another.

It seemed like too much to hope for, coming on top of his expectation, moments back, that his grant was to be discontinued. He had to put his hands together to stop them trembling.

"You're talking about synthesis, aren't you?"

"Yes, I'm from the Dilettante Dept. — or more officially, from the Office of Research Co-ordination. But I doubt if you have in mind exactly what I'm going to propose. I've seen the graphs of your scholastic career, and I get the impression that you could make yourself into a synthesist if you wanted to badly enough, with or without a doctorate." Dr. Foden leaned back in her chair.

"So the fact that you're still here—griping, but putting up with things—makes me suspect you *don't* want to badly enough. It'll take a good fat bribe to make you opt for it. I think nonetheless you may be honest enough to stay bribed. Tell me, given the chance, what would you do to round out your education?"

Donald stammered over his answer, turning crimson at his own inability to utter crisp, decisive plans. "Well —uh—I guess. . . . History, particularly recent history; nobody's taught me about anything nearer to home than World War II without loading it full of biased dreck. All the fields which touch on my own, like crystallography and ecology. Not omitting human ecology. And to document that I'd like to delve into the written record of our species, which is now about eight thousand years deep. I ought to learn at least one non-Indo-European language. Then—"

"Stop. You've defined an area of knowledge greater than an individual can cover in a lifetime."

"Not *true*!" Donald was gathering confidence by the moment. "Of course you can't if you've been taught the way I have, on the basis of memorising facts, but what one ought to learn is how to extract *patterns*! You don't bother to memorise the literature—you learn to read and keep a shelf of books. You don't memorise log and sine tables; you buy a slide-rule or learn to punch a public computer!" A helpless gesture. "You don't have to know everything. You simply need to know where to find it when necessary."

Dr. Foden was nodding. "You seem to have the right basic attitude," she acknowledged. "However, I must put on my Mephistopheles hat at this point and explain the conditions that attach to the offer I'm making. First, you'd be required to read and write fluent Yatakangi."

Donald blanched slightly. A friend of his had once started on that language and switched to Mandarin

Chinese as an easier alternative. However. . . .

He shrugged. "I'd be willing to shoot for that," he said.

"And the rest of it I can't tell you until you've been to Washington with me."

Where a man called Colonel—Donald was not told if he had a name of his own—said, "Raise your right arm and repeat after me: 'I Donald Orville Hogan . . . do solemnly declare and attest. . . .'"

DONALD SIGHED. Back then, it had seemed like the fulfilment of his wildest dreams. Five mornings a week doing nothing but read, under no compulsion to produce any kind of results—merely requested to mention by mail any association or connection he spotted which he had reason to believe might prove helpful to somebody; advise an astronomer that a market research organisation had a new statistical sampling technique, for instance, or suggest that an entomologist be informed about a new air-pollution problem. It sounded like paradise, especially since his employers not only did not care what he did with the rest of his time but suggested he make his experience as varied as possible to keep himself alert.

And in under ten years—he had to face the truth—he was getting bored. He could almost wish that they'd pull the second string attached to his work, the one which had caused him so much heart-searching.

Lieutenant Donald Orville Hogan, you are hereby activated and ordered to report immediately repeat IMMEDIATELY to—

"Oh, no!"

"Something wrong with you, blockbottom?" a harsh voice rasped inches from his ear. A sharp elbow jostled him and a scowling face stared into his. Confused, he discovered that without realising he must have made his decision about what restaurant to patronise today, and wandered down into the milling crowd that streamed the whole length of Fifth Avenue.

"What? Oh—no, I'm all right."

"Then stop acting like you're off your gyros! Look where you're going!"

The angry man he'd collided with pushed past. Mechanically, Donald put one foot in front of the other, still rather dazed. After a few moments, he concluded that the advice was worth taking. Perhaps part of his trouble was that he'd fallen into such an automatic routine he had lost the alertness and interest in the world around which had attracted Dr. Foden to him ten years back, in which case he was unlikely to get the option of resigning his job. More probable was what he'd half-feared when with a flourish of trumpets and a ruffle of drums they declassified Shalmaneser, and he'd foreseen automation making even synthesists obsolete.

And if he was going to give up his job, he wanted it to be on his own terms, not because he'd been fired for incompetence.

With a slight shudder he surveyed the avenue. Buildings tall as canyon walls closed it in, channelling the human traffic under the diffusely bright cover of the Fuller Dome. Of course, that didn't protect the whole of Greater New York, only Manhattan, which it had re-endowed with its former attraction and enabled to win back more inhabitants than it had lost in the late twentieth-century rush to the suburbs. Doming the entire city would have been out of the question on grounds of cost alone, though engineering studies had shown the feasibility of the project.

New York with its thirteen million people, however, was falling further and further back from the status it had once enjoyed as the world's largest city. It could not be compared with the monstrous conurbations stretching from Frisco to Ellay or from Tokyo to Osaka, let alone the true giants among modern megalopoli, Delhi and Calcutta with fifty million starving inhabitants apiece: not cities in the old sense of grouped buildings occupied by families, but swarming ant-heaps collapsing into ruin beneath the sledgehammer blows of riot, armed robbery and pure directionless vandalism.

Nonetheless, though it had shrunk to medium size by contemporary standards, this was still as large a city as Donald felt he could stand, and still possessed a certain magnetism. The biggest employer of them all, State, dominated the west coast; here were the next biggest, the supercorporations that were countries within a country. Ahead loomed the colossal ziggurat of the General Technics tower bridging three complete blocks, and it filled him with a sense of gloom. If he did quit—if it were possible for him to quit when they had pumped going on three-quarters of a million dollars of public money into him—his only future would lie in just such a mausoleum as that.

And look what it's done to Norman House!

Across the hugely enlarged sidewalks the people thronged like insects, milling at the access points to underpasses and the subway. On the central, official-business-only emergency lane prowl cars cruised or paused, occasionally pulling over to make way for ambulances and fire trucks. Either side of the centre, the huge humming buses without engines—drawing their power from flywheels spun up to maximum revolutions when they turned around at the end-points of their journey — hauled their loads of up to two hundred passengers, sliding at two-block intervals to pick-up bays and allowing the electric cabs to overtake. No internal combustion engine had been legal in the city since they put up the dome; the disposal of CO_2 and anthropotoxins from the people themselves was as much as the ventilation system could handle, and on warm days their exuded moisture sometimes overloaded the conditioners, precipitating a kind of drizzle underneath the dome.

How do we stand it?

He had chosen to live in New York because he had

been born here, and because it headed the short list of suitable residences they gave him to choose from—cities possessing the kind of library facilities needed in his job. But this was the first time he had looked at it, really looked with both eyes and full attention, in perhaps as long as seven years, and everywhere he turned he found that another straw had been piled on the camelback of the city. He had noticed the street-sleepers when he came back from college, but he hadn't noticed that there were hundreds of them now, pushing their belongings on little make-shift trolleys and being moved on, moved on by the police. He hadn't noticed the way people, when they were jostled, sometimes spun around and shot their hands to bulging pockets before they realised it wasn't a mucker on their heels. And speaking of muckers: he hadn't really connected it with the world he knew when the news reports described one who'd taken out seven victims in Times Square on a busy Saturday night. . . .

Panic clawed at him, the same kind of panic he'd experienced on the only occasion when he ventured to try Skulbustium, the sense that there was no such person as Donald Logan but only one among millions of manikins all of whom were versions of a Self without beginning or end. Then, he had screamed, and the man who had given him the drug advised against a repetition, saying he *was* his persona and without it would dissolve.

In other words: there was nothing inside.

Just ahead of him, two girls paused to examine a display in the window of a store. They were both in the height of fashion, one wearing a radio-dresslet whose surface pattern formed a printed circuit so that by shifting her buckled belt to right or left she could have her choice of broadcasts fed into the earpiece nestling under her purple hair, the other in a skin-tight fabric as harshly metallic as the case of a scientific instrument. Both had chromed nails, like the power terminals of a machine.

The display that had caught their attention was of genetically-moulded pets. Processes that already worked well with viruses and bacteria had been applied to their germ-plasm, but on this more complex level the side-effects were excessively random; each pet on show probably stood proxy for five hundred that never left the lab. Even so, the solemn, over-sized bushbaby in the window looked miserably unhappy for all the splendour of its purple pelt, and the litter of bright red Chihuahua pups below staggered continually as though on the verge of epilepsy.

All that seemed to concern the girls, however, was that the bushbaby's colour almost exactly matched the hair of the one in the radio-dresslet.

First you use machines, then you wear machines and then. . . .

Shaking all over, Donald changed his mind about a restaurant and turned blindly into a bar to drink instead of eat his lunch.

In the afternoon he called on an out-of-work poetess he knew. She was sympathetic, asked no questions and allowed him to sleep off his drunk in her bed. The world looked a little better when he woke.

But he wished desperately that there could be someone—not this girl necessarily, not even a girl at all, just *a person*—to whom he could explain why it was he had been moaning in his sleep.

The Happening World (6)
Street Seen

"I can't see heaven but I credit hell—
I live in New York so I know it well.
When they shut out heaven with the Fuller Dome
God gave it up and He went home."

ONE WAY NORTHBOUND.

"Gotta go dump my passenger—pulled a bolt-gun and I had to doze the bleeder. Dicty, of course. Spotted him right away, but dreck, if I turned down every dicty who wants a ride I'd never get a fare after seven poppa-momma. . . . So anyhow: I'll be off call until I've sworn out the complaint."

UNDERPASS.

Rooms by the hour $3.

"Heard the new one about Teresa?"

ONE WAY WESTBOUND.

*Licensed panhandler, City of Greater New York, Muldoon Bernard A. No. PH*2 428 226.

PEDESTRIANS ONLY.

"So I said to him look block I said I've celebrated my twenty-first even if you haven't. I said I didn't treat your daughter like a whore because I never met a freaking whore because they're as obsolete as your idea of a shotgun wedding. I said come to that isn't it better my way than what she's getting up to with that freaking lizzie of a stepmother of hers. He didn't know about that. Took the fuel out of his jets, I do depose!"

ONE WAY SOUTHBOUND.

Menu $8.50, $12.50, $17.50.

"Mr. and Mrs. Everywhere hit Times Square yesterday—it'll be crowded."

KEEP TO THE RIGHT.

Show nitely—and do we mean SHOW!

ONE WAY EASTBOUND.

'Say, I—uh—know my way around the block better than most people. Care I should do you a small favour? Now I have at present just a trifle more Yaginol than I can personally use, and. . . ."

WAIT.

Public lectures daily, demonstrations Wednesday and Friday. Auparishtaka, Sanghataka, Gauyuthika, etc. Coaching by experts. Enrol here any time. Mrs. Grundy Memorial Foundation (may dogs grub up her bones).

"They programmed Shalmaneser with the formula for this stiffener, see, and. . . ."

WALK.

Colossal unbelievable impossible bargains! Store of a million miracles! Cruisers welcome subject to evidence of cash or credit.

DO NOT LOITER.

"Attention attention—we have reports of a pseudo cab working the lower East Side, dozing and rolling passengers. Stop and check all cabs vicinity Sixth Street Avenue B."

NO SPITTING.

Office space for rent, or would convert to dwelling at client's expense.

"This new homimage attachment is the best I've ever seen."

DOGS FOULING SIDEWALK WILL BE DESTROYED.

Psychometrist, clairvoyante, offers guidance to the insecure.

BEWARE OF PICKPOCKETS.

"It's like the universe was a hole, catch me? And I'm all spread out thin around the sides, catch me? And then sometimes it's like the room turns inside out and I'm the spots on the six sides of the dice. Or else—ah, why should I bother talking to a block like you?"

RAPID TRANSIT.

Municipal ordinance No. 1214/2001. *Persons of no fixed abode to register at nearest police station and obtain permits before sleeping rough.*

"It trips you farther and faster than the Everywheres can manage!"

SANITARY CONVENIENCES.

Joe's Joints—N.Y. brands $3 *for* 10, *out-of-state brands* $5, $6.

STOMP THAT ROACH! BEWARE OF FIRE!

"Hey codders! Shade and fade there's a prowlie on the next block!"

DO NOT PLACE NOXIOUS REFUSE IN UNLIDDED RECEPTACLES.

"What shall we do with our fair city,
Dirty and dangerous, smelly and shitty?
If you're a friend of New York town
You'll find a hammer and smash it down."

Continuity (8)

The Camel's Back

IT WAS ALMOST a shock to Donald to discover how normal the night-time city appeared. It was less crowded than by day because of the phobia he himself had fallen victim to, but that was actively pleasant and made him feel he had gone back in time to the days when he was fresh from college and there had been a million fewer bodies to jostle against on the sidewalk.

Did I not expect the same stores to be in the same places as by day?

He wanted to laugh aloud at his own forebodings. Nonetheless, something was strange. By degrees his mind edged towards recognition of it; it was the kind of problem he was good at, working from hint to clue without having to give the matter his entire attention.

The night was loud. Music came from everywhere, mostly hits from the current pop parade in which two or even three disparate rhythms clashed randomly on semi-tonal discords, but sometimes classical — in a hundred yards he identified Beethoven, Berg, Oyaka. That, however, was true of the day as well, especially since the makers of radio-dresslets had begun to fit speakers to their garments instead of phones.

What did strike him as unusual was the sound of talking. Everywhere he heard people gossiping, a luxury for which the day allowed no time.

Hint: these people know each other, say hullo.

Anonymous to him but acquainted among themselves, they grouped in little knots of four or five all over the sidewalks. He had half-assumed they were street-sleepers, until he realised that even by modern standards there were too many of them and began to spot the genuine article: sad-eyed men and women—and children too—clinging to their bags of belongings, waiting for midnight and the legal chance to lie down wherever space presented itself.

"Are you weary, are you heavy laden? Come to Jesus, come and rest in his bosom!" A woman minister on the steps of a store-front church, addressing the passers-by through a hand shouter.

"No thanks, *madam*, I fly a straight-type orbit!"

yelled a passing yonderboy, and his sparewheels screeched laughter and clapped him on the back. The yonderboy was Afram and so was the minister. The proportion of Aframs in view was five or six times higher than by day.

They look at me with curiosity. Is colour a clue?

But that was a false lead. Bit by bit he pinned down the true reason. He was dressed in the conservative, slightly behind-the-style clothes he generally wore. Most of the people he passed either were shabby, like the street-sleepers who often as not wore disposables meant for one wearing, kept on for ten, or had taken the fall of darkness as a signal to let their imaginations run riot. Not only the yonderboys with their fantastical puffed shirjacks designed to give the impression of enormous muscles, but the older folk too were gaudy as peacocks in scarlet and turquoise, ebony and chrome. They strutted in everything from RUNG-type robes to a coat of paint and a few strategic feathers.

Answer: it feels like a foreign country.

He gave a thoughtful nod. There was a Caribbean mood in these people's casual employment of the street as an extension of their homes. It must have been triggered by the erection of the dome, building on and amplifying the high-summer tradition and extending it throughout the year.

THE CHARACTER of the neighbourhood began to change. He found himself being accosted by shills.

"White noise concert in progress, codder! Only a fin!"

"Excerpts from the Koran in English, live reading, sure to be of interest to an intelligent person such as yourself!"

"Hear the truth which the government screens from you! Recording direct from Peking giving all the facts!"

When he had gone a mile or more the grins and gestures of people he passed led him to discover a small luminescent poster attached unfelt to his back. Annoyed, he removed and read it.

This codder doesn't know where to. On Triptine he'd be there before he had time to worry.

A GT promotion? Hardly. It was notorious that the government discouraged excessive zeal by the Nark Force, because psychedelics drained away so much potential subversion, but there were still—officially—laws in most states. He balled it up and threw it at a trashcan.

A lean, rather scholarly-looking Afram fell in beside him and kept tossing him sidelong glances. When they had gone a score of paces together he cleared his throat.

"Weren't you at—?"

"No," Donald said. "Spit the string and I'll tell you if I'm interested, which'll save your time and mine."

The Afram blinked. After another few strides he shrugged. "No complaints about that. Father?"

"No."

"Want your genotype read? Show me your palms. A fin gets you a strict scientific commentary—I have certificates."

"Thanks, I can afford genalysis."

"But no prodgies, hm?" The Afram looked wise. "Could be the trouble is with the Eugenics Board—no, don't tell me. However bad it is there are ways to fix it. I have certain contacts, and if you can afford genalysis you can probably afford their services."

"I'm clean," Donald said with a sigh.

The Afram stopped dead. Involuntarily Donald did the same and turned so they were facing each other.

"You son of a bleeder," the Afram said. "Here all I'm carrying is sickle-cell anaemia which in the malarial belt is actually advantageous, and they won't let *me* though I've been married three times."

"So why don't you try the malarial countries?" Donald snapped. He slipped his hand into the pocket containing the Jettigun.

"A typical paleass remark!" the Afram sneered. "Why don't you go back to Europe, then?"

Abruptly Donald's annoyance faded. He said, "Look, cousin, you should meet my roomie and learn better. He's Afram too."

"You I don't mind about," the Afram said. "The fewer of you who fly straight orbits the better. But it's a thing to weep about, you having a brown-nose roomie. Another generation, you'll have melanin-high skin on the list of disallowed genes!"

He spat deliberately an inch from Donald's feet and spun on his heel.

Depressed by the encounter, Donald walked on. He was barely aware of the distance he covered. Occasional stimuli made an impact on him—the banshee wail of a prowlie's siren, children fighting over an insult, the ever-present music—but he was preoccupied.

The Afram's reference to the malarial countries had sparked a train of thought, bringing back to mind what Norman had said earlier about Beninia. As ever, his computer-active subconscious had been stirring his information into new patterns.

State would want to know why Elihu Masters was making an approach to GT. Assumption: State does know why. If either the Dahomalians or the RUNGs persuade Beninia to federate, the disappointed party will have to fight or lose face. The only things that can prevent war are (a) Present Obomi who isn't immortal and (b) the intervention of an outside force they could join in railing against. In which case—!

He had it, all of a sudden. Three hours' reading, five days a week bar vacation for ten years, had stocked his memory with all the information necessary to envisage the plan as it had to be.

But in the very instant it came to him, the knowledge was kicked to the back of his mind. Stopping dead, he wondered where in the name of God he was.

By the street signs he had reached the lower East

Side, an area presently at the bottom of the cycle of death and renewal that sometimes made the city seem like an organism. At the end of last century there had been a brief moment of glory here; decade by decade the would-be connectors had followed the intellectuals and the pseudos eastwards from the Village into the ruined area close to the river, until by 1990 or so this had been a high-price zone. But the wheel turned further, and the bored and prosperous moved out. Now the grace of the elegant buildings was crumbling again under a bright masking of advertisements: *flagging vigour calls for Potengel, MasQ-Lines take the world in their stride, ask the man who's married to Mary Jane.* . . . Across the display slanted the unrelated diagonals of fire-escapes, spotted with piles of garbage-like forest fungi.

Donald turned slowly around. There were fewer people on the streets here. The very air breathed a sense of decay. Only a few minutes' walk away was the brilliance and activity he had left behind without noticing, so it was small wonder the residents preferred not to spend their time here. The stores were closed except for the few that could afford automated pay-out clerks, and those were almost vacant of customers. There was no silence—there was no silent place in the city—but every sound which came to his ears seemed to be distant: not in that building but the next, not on this street but a block away.

Facing him now was one of the luxuries the architects had included when they worked this district over twenty years ago—an adventure playground elaborated into the gap between two tall buildings, a monkey-puzzle in three dimensions calculated so that a careless child could fall no farther than one short level. For a moment his mind refused to accept the connection between the lines and forms he saw, and anything with solidity. Then the perspective separating near from far enabled him to grasp the image and he realised he was looking at a sort of Riemann ladder of concrete and steel silhouetted from behind by the last of the unbroken lamps on the struts.

Something moved among the frightful artificial branches. Donald, uncertain whether it was human, eased his hand into his pocket and began to wriggle his Karatand over his fingers.

The monstrous creature loomed, incredibly flexible, down the lip of a miniaturised precipice, and took on reality—a shadow, cast by a child passing in front of the surviving lamp.

Donald let out a great gasp of relief. The idea occurred to him that he must have been slipped a psychedelic, and then, when he discounted actual ingestion, he found himself wondering if perhaps the air was charged with the fumes of some drug affecting his perceptions.

Mechanically tugging the Karatand towards his wrist, he beat a retreat towards his own manor.

Unexpectedly, because this was not a cab-hiring district, he spotted a cruising taxi within a hundred yards. He called to the driver, who acknowledged him with a wave shadowed on the windshield.

Purring, the vehicle drew level with him. He made to get in as the driver activated the hydraulic door-controls.

Not so fast.

The words were as clear in his mind as if someone had spoken them from inside the passenger compartment. He delayed removing his hand from the door-pillar and looked for anything which might have alarmed him.

Probably imagination. I'm jumpy enough—

But no. Affixed to the air-conditioning nozzles was a device that automatically sent a radio signal to police headquarters if the driver dozed a passenger. It had been tampered with; the plastic seal certifying its annual inspection had discoloured to a warning red. He'd hailed a pseudo, one of the cabs whose drivers dozed their victims illegally and took them to be robbed in a dark side-street.

The door slammed. But not all the way. Even with the force of the hydraulics behind it, it could not crush the impact-sensitive Karatand which Donald had left in its way. There was a clang of hammered metal and a jar that travelled clear to his elbow, but he retained enough presence of mind not to snatch back his hand.

By law, these cabs were designed so that they could not be driven away unless the doors were closed. But Donald's strength was inadequate to force his way out.

Impasse.

Behind the armour-glass of his cabin, the driver hit the door controls again and again. The door slammed back and forth, but the Karatand endured. Suddenly very calm, Donald stared at the driver, but the man was too wary to let his face be seen even in the rear-view mirror. It was twisted to the side so that it covered his licence photograph, and its function had been taken over by a miniature T.V. unit.

What am I going to do now?

"All right, Shalmaneser!"

The voice made him start as it boomed from the speaker set in the roof.

"I'll open up, you hit the sidewalk and we'll say no more about it, how's that?"

"No," Donald said, surprised at his own determination.

"You can't get out unless I let you."

"You can't drive off unless I let you."

"Hoping for a prowlie to come by, hm? Fuzzy-wuzzies don't pass this way if they can help!"

"Somebody's going to notice a cab with the hire sign lit sitting in the middle of the street and not moving."

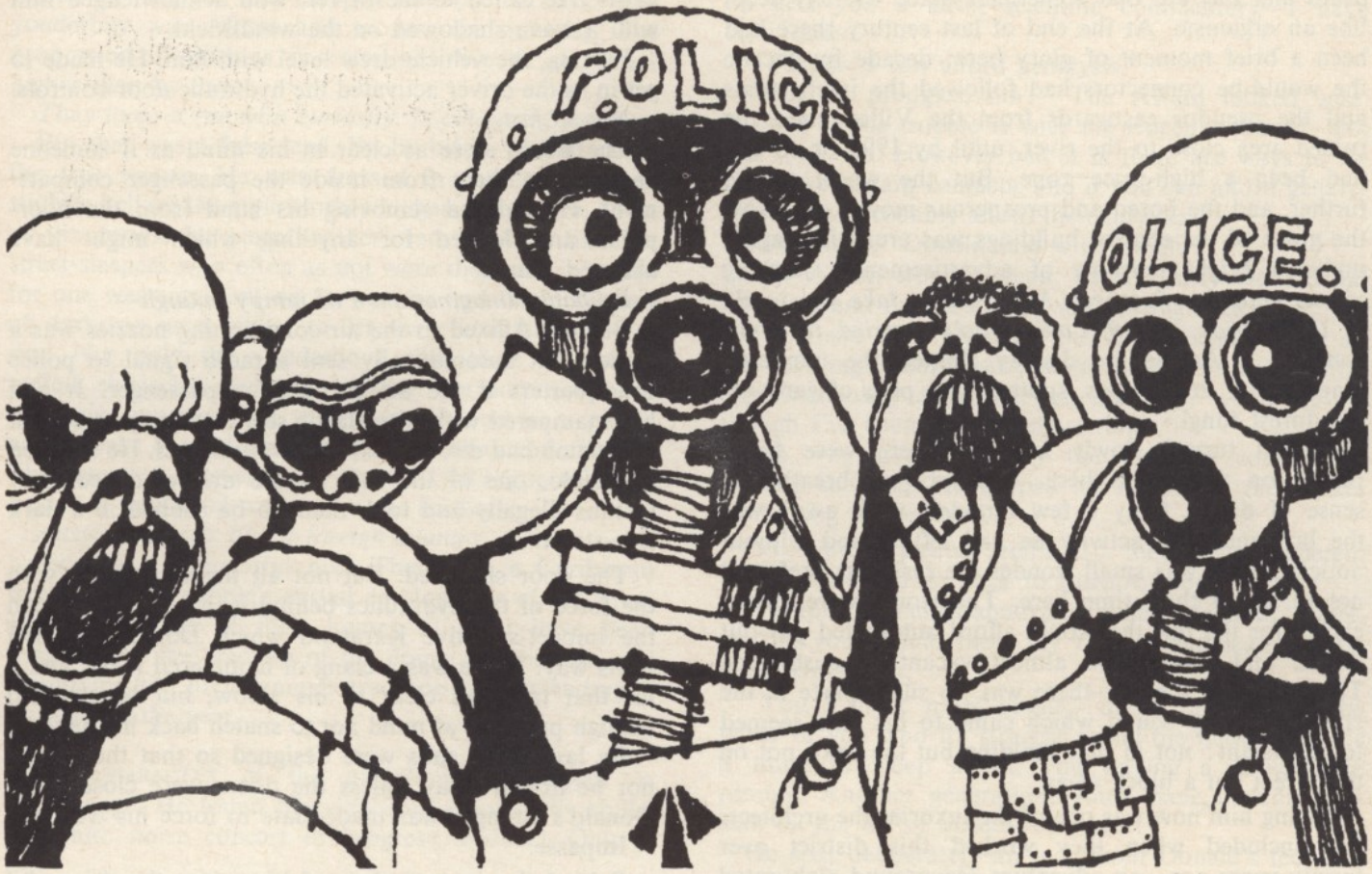
"Who said it was lit?"

"You can't turn it off without you close the door!"

"Think not? I cut the police alarm, didn't I?"

"And it shows—you turned the seal red."

"You're the first in two weeks noticed that. Last one I chopped the fingers off."



Donald licked his lips and eyed the adjacent sidewalks. Although this district was comparatively empty, it was not wholly unpopulated. An old Afram woman was this very moment approaching. He leaned to the gap in the door and called out.

"Lady! Fetch the police! This cab's a pseudo!"

The old woman stared at him, crossed herself and hurried by.

The driver gave a sour laugh. "You don't know what it's like around here, do you, Shalmaneser? Got left out of your programming!"

Donald's heart sank. He was on the point of admitting defeat and offering to hit the sidewalk, when a movement at the corner of the street attracted him.

"You said prowlies don't come this way," he exclaimed.

"Right."

"Then how about that one closing from behind?"

The driver stared at his T.V. unit, dismayed.

Does he think I'm bluffing? That's no bluff—it's a hundred per cent genuine prowl car!

Armoured, armed with gas and flame, the police car pussy-footed towards the stationary cab. The driver sounded his move-along siren.

"Take your hand off the pillar," the hackie said. "I'll balance the deal for you. What you want? I have contacts—Skulbustium, Yaginol, shiggies, name it and I'll fix it."

"No," Donald said again, this time triumphantly.

He could see the silhouettes of the men in the prowlie now. Also, by this time, half a dozen people had gathered on the sidewalk. A couple of them were teenage Aframs, who shouted something indistinct at the police and doubled up in laughter.

The door of the prowlie opened, and Donald relaxed. A matter of seconds now—

Except that the moment the fuzzy-wuzzy stood up on the street, a hail of garbage pelted him from nowhere. He yelled a curse, hauled out his bolt-gun and sent a shot high into the darkness towards the adventure playground. The driver piled out of Donald's cab and the policeman loosed another shot at him but missed. A whole can of garbage came slamming down from a higher level now, contents first, then can, squelch, then *crash*. Another policeman leaned out of the car and fired at the approximate source of the attack.

Belatedly aware that the door was no longer pressing on his hand, Donald scrambled out, shouting for the police to stop wasting their shots and go after the hackie. The man peering from the prowlie's window saw him only as a human shape and fired at him. The hiss of the bolt searing past his ear made him gulp and

stumble for the sidewalk.

A hand reached up from the protection of a stoop and caught his ankle. The gesture might have been friendly but Donald could not tell. He tore his Jettigun from his pocket and fired it into the face of the man who had clutched at him.

A scream. A girl's voice: "You do that to my brothah—!" Windows flinging open both sides of the street. Shouting kids, emerging from the senseless shadows of the adventure playground, delighted at the excitement and starting to hurl down whatever came handy—fragments of split concrete, cans and packages, plant-tubs. A dark, pretty face transformed by fury. The erratic brilliance of gun-bolts as the police fired wildly. Someone uttering a resonant Spanish curse: "May that lover of he-goats catch the clap and the pox!"

He struck out at the girl who was trying to claw his face, and remembered his Karatand too late. The metal-rigid glove slammed into her mouth and sent her moaning and bleeding into the middle of the street, into the fierce lights of the prowl car. The red trickling down her chin was brilliant as fire.

"Kill the bleeders!"

Where did they all come from?

Suddenly the street was alive, like an overturned ants' nest, doors and passages vomiting people. Metal bars glinted, throats shrieked animal fury, windows shattered and glass rained slashingly on heads below. The prowlie's siren added to the din and the two policemen who had ventured out climbed back in a second ahead of another salvo of garbage. Between the prowlie and the cab the injured girl rocked on her heels, moaned, dripped blood from her cut lip down her shimmering green dresslet. Donald shrank back into an embrasure decorating the wall of the nearest building, overlooked because the late arrivals had taken it for granted that the police were responsible for the girl's crying.

The prowlie tried to back up. Through its still-open window Donald heard its occupants shouting to headquarters for aid. A flame-gun belched at the base of a lamp-post and metal ran like lard in a pan. The post fell across the back of the prowlie and blocked its retreat. Yelling joyfully, scores of people ran to develop the improvised barricade into something more substantial. A can of oil was flung down and the flame-gun ignited it. Capering like dervishes youths and girls taunted the police by its light. Someone scored a hit on the car's left headlight with a rock and it shattered. Too late the driver remembered to wind up the wire-mesh screens. Another scream of triumph and another rock, making the car's roof boom like a steel drum. Paint chipped and fragments flew, one of them taking a standerby in the eye so that he covered his face with both hands and shouted that he was blind.

That settled matters.

"Oh my God," Donald said, and it was more of a prayer than he had uttered since he was a schoolchild. "It's going to be a riot. It's going—to be—a *riot*. . . !"

Context (9)
Guncrit

"PEOPLE WHO FEEL the need to foul up their perceptions with hop or Yaginol or Skulbustium simply aren't turned on to the essential truth that the real world can always be identified by its unique characteristic: it, and it only, can take us completely by surprise.

"Take two lumps of greyish metal and bring them together. Result: one wrecked city.

"Could anyone have predicted or envisaged that until they knew enough about the real world to calculate the properties of a substance called uranium-235?

"People are going around marvelling at the fact that there's a solid scientific basis for palmistry. Anybody with a grain of intelligence could have said, directly the notion of the genetic code was formulated, that there was no *a priori* reason why the pattern of the folds in the palm should not be related to a person's temperament by way of an association of genes sharing the same chromosome. Indeed, there were all kinds of reasons for assuming this actually was so, because we aren't totally stupid—as I've pointed out before—and unless there was in palmistry some element of relevance to real experience we'd have given it up and gone chasing some other will-o'-the-wisp. There's no shortage of them.

"But it took forty years for someone to conduct a properly rigorous study of the subject and demonstrate that the suspicion was well-founded. This I do find remarkable—or disheartening might be a better word.

"All right: what should you be surprised at, these days?

"The fact that, having learned so much about ourselves—the designs on our palms being just one example of the way we've analysed ourselves down to the constituent molecules, so that we can claim to be in sight of the day when we won't merely be able to ensure the sex of our offspring (if we can afford the fee) but also to choose whether we'll have a math genius in the family, or a musician, or a moron (some people might like to breed a moron for a pet, I guess. . . .)—having got to this state, then, we know less about our reactions in the mass than we do about the behaviour of non-human things like a lump of U-235.

"Or maybe it's not so amazing. Without being *totally* stupid, we do display a tremendous aptitude for it."

—*You*! *Beast* by Chad C. Mulligan.

(HISTORY.—Papa Hegel he say that all we learn from history is that we learn nothing from history. *I* know people who can't even learn from what happened this morning. Hegel must have been taking the long view.

—*The Hipcrime Vocab* by Chad C. Mulligan).

Tracking With Close-ups (9)
Poppyseed

WAS THIS REALLY a drab corner of the world, or was it only apparently drab because she was back from orbit? To a place like this one had to come walking firm and heavy on one's own two feet, just in case when they did the analyses they thought to check for what was usually there, but according to people who should know the end-products should be flushed out by a thirty-six hour abstinence, which was free-falling.

But it made one so easily bored.

Detail by detail: the plastic walls, of a faded yellow; the windows turned to part-opaque because the sun was shining on the far side of them; various posters displayed in frames, setting forth miscellaneous regulations you were supposed to comply with; benches apparently designed to make the users uncomfortable so that persons of no fixed abode would not care to keep returning on pointless visits for the sake of a seat and a little warmth; and everywhere the smell of staleness, of dust and ancient paper and old shoes.

The only touch in the place which suggested nature was in the floor, covered by tiles with a design of dead leaves embedded under a clear plastic surface. But even that was a failure, for when one looked directly down at the tiles one noticed the way the pattern repeated, and if one looked obliquely, the leaves disappeared behind a mist of scratches and scrapes, the legacy of uncountable feet that had crossed the room, and all one could see was a generally dung-brown expanse.

"Not much longer."

"Better not be."

The other people waiting glanced up, the fact of speech being a distraction and a stimulus. They were all women, from twenty to fifty, and all further advanced than Poppy, some with their bellies protruding far on to their laps, others as yet barely showing a roundness. These latter would presumably have come to hear the result of their karyotypings. Poppy shuddered at the idea of having fluid from her womb drawn off through a needle, and wondered how many of these women would have to be officially emptied of their offspring.

As though to enter the protective aura of her femininity, being the only man present, Roger crowded close and put his arm around her shoulders. She reached up to stroke his hand and smiled sidelong at him.

She was a strikingly lovely girl, even dressed as usual in three-quarter puffed slax that need laundering and a shapeless bluzette meant to fit a much bigger woman. She had a fine-boned oval face highlighted with big dark eyes and framed with black braids, and just enough tawny admixture to her complexion to make her seem feral. And, as yet, her pregnancy had done nothing except improve the line of her bust.

She giggled at a private thought, and Roger squeezed her with his encircling arm.

"Miss Shelton," said a disembodied voice. "And—ah—Mr. Gawen!"

"That's us," Roger said, and rose to his feet.

Through the door which opened for them on their approach, they found a tired-faced man of early middle-age seated at a table beneath a picture of the King and Queen and their two—count them, a responsible number, *two*—children. Ranked before him were piles of forms and a number of sterile-sealed containers with spaces on the lids for writing names and numbers.

"Sit down," he said, hardly looking at them. "You're Miss Poppy Shelton?"

Poppy nodded.

"And—ah—how long?"

"What?"

"How long since you became pregnant?"

"My doctor says about six weeks. I went to him when I missed my period and he told me to come along here as soon as I was sure it wasn't irregularity."

"I see." The man behind the table wrote on a form. "And you're the father, are you, Mr. Gawen?"

"If Poppy says so, yes, I am."

The man gave Roger a sharp glare as though suspecting levity. "Hah! Well, it always helps to have the putative father turn up. These days one can't rely on it, of course. And you want it to go to term, Miss Shelton?"

"What?"

"You actually want to bear the child?"

"Of course I do!"

"There's no 'of course' about it. Most of the women who come in here arrive armed with everything they can think of in the hope of being granted an abortion—lists of diseases they caught as children, the story of how grandma became senile after her hundredth birthday, or some specious bit of string tied to a child on the next block who's rumoured to have German measles. Are you getting married?"

"Is that required by law, too?" Poppy snapped.

"No, unfortunately. And I don't like your tone, young woman. The things that are—as you put it—'required by law' are a simple matter of human ecology. With almost a hundred million people in this overcrowded island of ours, it would make very little sense to continue wasting our resources both material and human on such pointless undertakings as training phocomeli or cleaning up after morons. All the advanced countries of the world have come around to this point of view now, and if you want to evade the legal restrictions on childbearing you'll have to go to a country that can't afford decent medical care for you anyway. Here at least you're assured that your child will on the one hand have no hereditary disabilities and on the other enjoy adequate protection from pre- and post-natal risks. What you make of the child after it's born is up to you."

Poppy giggled again, and Roger clamped his hand on her arm to shut her up.

"If the lecture's over . . . ?" he hinted.

The man shrugged. "All right. Did your doctor tell you what you were to bring with you?"

Roger unloaded containers from the sagging pockets of his shirjack. "Urine samples—hers and mine. Semen

sample in this plastic envelope. Nail parings, hair clippings, saliva and nasal mucus, all here."

"Good." But the man didn't sound pleased. "Stretch out your hand, Miss Shelton."

"Does it hurt?"

"Yes."

He jabbed at the back of her finger with a needle, squeezed out a drop of blood, absorbed it on a sheet of filter paper and placed it in a labelled envelope.

"And you, Mr. Gawen."

The process repeated, he leaned back in his chair. "That's all for today, then. If there's no immediately apparent hereditary defect you'll be allowed to continue the pregnancy until the thirteenth week when you must present yourself at a hospital for karyotyping. You'll be notified in about three days. Good morning."

Poppy lingered. "What happens if it's disallowed?" she said after a moment.

"Depends. If it's because of something you're carrying, abortion and sterilisation. If it's because of something he's carrying that you contribute a recessive to, abortion and orders not to start another one together."

"And if I don't turn up to have it aborted?"

"You get want-listed, arrested if you're caught and jailed. In any case, no hospital in the country will accept you in its maternity unit, no midwife will attend you and if the child is born deformed it will be institutionalised." The man relented a little. "It probably sounds harsh, doesn't it? But I'm afraid it's part of the burden of responsibility towards the next generation that we in the present day have had to accept."

Poppy giggled once more and Roger, flushing with embarrassment, led her out.

On the street, she flung her arms around him and jumped up and down.

"Roger, we're going to make it, we're going to make it!"

"I hope so," he said with less enthusiasm.

"Oh, you're an old pessimist. Must be because you're down on the surface. Got anything with you?"

"I have some Skulbustium gum. But isn't that one of the things you're supposed to avoid?"

"No, the doc said it was only Yaginol that was likely to affect the kid."

"You sure?"

"Absolutely. I asked him specially and that's what he told me."

"Okay, then."

He extracted the pack from his pocket and together they chomped on the vaguely aniseed-flavoured chiclo lumps, waiting for the lift to catch them. They stared at their surroundings in search of clues. At the far end of the grimy London street barriers had been erected with big signs on them stating that the road was closed for development; as at many places in the metropolis the plan was to build over the original roadway and leave only pedestrian passages.

Bit by bit the red and white poles of the barriers began to seem like the stems of exotic plants, the red in particular glowing hot as fire. The memory of the drab official waiting-room, of the unpleasant bureaucrat who had interviewed them, receded into a dream-like distant past. Poppy, one hand on her belly to bless the miracle taking place there with a willed contact, grew round-eyed in awe.

"He's going to see this world, isn't he?" she whispered. "Not that one — not that shit-floored dingy horrible kind of world, but a beautiful place that never stops being exciting. Roger, which of the lifters comes out in the milk? I've got to make sure he never sees the ugly world at all!"

"We'll have to ask the doc," Roger said. His face had settled into an expression of tranquil certainty. "The doc's helped lots of others besides us and he's bound to know."

He took her hand and they walked, the only two real people in the universe, down a street paved with jewels towards a land of love.

Context (10)

The Baby and the Bathwater

"ALL RIGHT, I'LL grant you that it's ridiculous to spend years training highly-qualified medical personnel and psychologists and so on and then set them to a job that's going to show no tangible results because the material they're working with is hopeless from the beginning, like imbeciles. I'll even concede the bit about such people having a nasty power complex and liking to lord it over helpless human vegetables, though that's something I really need to be convinced about before I'll swallow it entirely. And I certainly won't contest the fact that there *are* too many of us—the news is evidence enough for me, what with all those famines they're having in Asia and plague still cropping up in Latin America and the development of this seasonal nomadism in Africa because half the year the land won't support the people who are on it. All this I'm giving you without argument.

"But are we adopting the *right* measures to cope? Look at haemophilia, for example: it didn't stop victims of it being the crowned heads of Europe, and most of them showed up pretty well compared to some of the right bleeders who'd kept their thrones warm before the gene put in an appearance. You're not going to tell me that Henry VIII of England or Ivan the Terrible was a descendant of Queen Victoria. Or take the way some of the states have banned people with web-fingers and web-toes; you'll find plenty of doctors to argue that's no more than an adaptation that got started in the days when men were beach-creatures inhabiting swamps and shallows and living mostly off weed and shellfish.

"And how about schizophrenia? They're still trying to settle it for sure whether the chemical symptoms are due to a stress reaction or whether they're innate and some people are merely more prone to it but can be

kept safe in the correct environment. *I* don't believe there's a genuine hereditary effect at all—I think it's just that we tend to copy the behaviour-patterns of our family, and it's one of these in-group extended responses like infanticide being higher among the children and grand-children of bad, affectionless families regardless of their genotype. You have schizoid-prone parents, you learn the action pattern, and that's that.

"And how about diabetes? It's crippling, admittedly, and you have to lean on a chemical crutch. But—well, my own name's Drinkwater, which almost certainly means that some of my ancestors, like French people named Boileau and Germans named Trinkwasser, must have been hereditary diabetic poly-dipsomaniacs.

"And if there'd been eugenic legislation back in the days when people were adopting surnames, they'd have been forbidden to have children and I wouldn't be here now.

"Don't you understand? *I wouldn't be here*!"

Continuity (9)
Divided Against Itself

LIKE THE MONSTROUS shaped negative-plate of explosive forming press the environment clamp itself on the personality of Donald Hogan, as a hand clenched around a lump of putty will leave the rid- between fingers, the imprint of the cuticular pattern. felt his individuality squirt away from him into the dark ness, carrying off in solution his power to conceive and act on decisions, reducing him to a reactive husk at the mercy of external events.

Some social theorists had argued that urban man was now at the point of unstable equilibrium; the camel's back of his rationality was vulnerable to a straw. Gadarene swine rooting and grunting at the top of a hill overlooking the sea, people sensed this, said the theorists, and therefore when there was an option to do otherwise they did not venture to crowd themselves still further into the already crammed cities. In countries such as India there was no alternative; starvation was slower in an urban community because people were closer to the distribution points for subsistence rations, and more lethargy induced by hunger reduced friction and outbursts of violence to a sporadic level. But comparatively well-nourished American and European populations might be tipped over the precipice with no more warning than the sort of aura of irritability for which one carried a pack of tranks.

The last coherent thought Donald was capable of formulating declared that it was one thing to have read of this risk, another altogether to watch it being proved real.

FOCUS: THE PROWLIE. White-painted, trapezoidal vehicle thirteen feet long by seven wide, its wheels out of sight underneath for protection against shots, dispersed around the flat slab tank of the fuel-cell powering it, its forward cabin for four men windowed with armour-glass and additionally screened with retractable wire grilles, its rear section designed for carrying off arrestees and if necessary the injured, having a solid metal drop-down tailgate with stretcher rails and a sleepy-gas air-circulation system. On the nose, two brilliant white lights with a field of 150°, one extinguished because the driver had waited too long to roll up the wire screen and protect it; on each corner of the roof other lights with adjustable beam-spread; revolving in a small turret on the roof, a gas-gun shooting fragmenting glass grenades to a distance of sixty yards; under the skirt, for ultimate emergency use only, oil-jets that could flood the adjacent street with a small sea of fire to keep back attackers while the occupants waited out the period till help arrived, breathing through masks from a stored-air system. It was vulnerable to mines, to three successive hand-gun bolts striking within about two inches of each other on the shell, or the collapse of a building, but to nothing else encountered during an average urban riot. However, its fuel-cell was inadequate to push out of the way either the stationary cab ahead, whose brakes were automatically set because its door was open, or the lamp-post dropped across its stern, which had now been wedged in position with much sweating and swearing against its own stump on the one side, and a well-anchored mailbox on the other.

FOREGROUND: materialised as though from air, crowding the sidewalk, scores—hundreds—of people, mostly Afram, some Puerto Rican, some WASP. One led with an electronic accordion, fantastically loud at maximum volume, making windows rattle and eardrums hum, shrieking a song through a shouter which others took up and stamped to the rhythm of: "*What shall we do with our fair city, dirty and dangerous, smelly and shitty*?" Clang on the body of the prowlie whatever they could find to throw—lumps of concrete, garbage, bottles, cans. How long before the gas-gun and the flaming oil?

SETTING: the uniform twelve-storey faces of the buildings, each occupying a block or half a block, hardly punctuated by the canyon streets because the abandonment of cars within the city meant that a one-way lane for the use of official vehicles or cabs was enough. Buses ran only to the next corner left, two corners away right. The sidewalks were defined by four-inch concrete barriers, small enough to step over, high enough to prevent any legally passing vehicle from running into a pedestrian. On the face of almost every building, some sort of advertising display, so that spectators in upper rooms looked out of a shabby ocean, the middle of a letter "O", or the crutch of a receptive girl. A single exception to the cliff-wall nature of the street was formed by the adventure playground, like the intrusion of Einstein into the ordered world of Euclid.

DETAIL: the face of the building against which he cowered, opposite the playground, was ornamented more than the average of its neighbours, possessing both a broad stoop above street-level for access to the

interior and a number of integral buttresses, flat-faced, arranged in pairs with a gap of about two feet between each, tapering from a thickness of two feet at the bottom to nothing at the level of the fourth floor. One of these embrasures sufficed to shield him from light, the passing and re-passing rioters and the hurling of improvised missiles. Clanging of metal above made him look up. Someone was trying to get the retractable fire-escapes to angle outwards from the wall instead of straight down, so that from their vantage point things could be dropped on the roof of the trapped prowlie.

FSST-CRACK. Fsst-crack. Whir-fsst-crack. Gas-gun.

Grenades smashing against the walls of the buildings, each releasing a quart of sluggish vapour that oozed down into the narrow culvert of the street. The first victims coughed, howled and keeled over, having sucked in a full concentrated dose, and those lucky enough to be out of range of the first salvo ducked to the ground and hustled away crouching.

Fsst-crack. Whir-fsst-crack.

The girl whose mouth he had cut was staggering away from the middle of the street, coming towards him. Possessed of some vague impulse to help, Donald emerged from the shelter of the embrasure between the buttresses and called to her. She came because she heard a friendly voice, not seeing who spoke, and a clubbed arm slammed at the back of his left shoulder. From the corner of his eye he saw the hand was Afram. He ducked, dodged. The gas-gun crashed grenades on this side of the street now, and the first whiffs made breathing hateful. Those who had evaded gassing so far were taking to the skeletal branches of the playground like archetypal proto-man eluding a pack of wolves. The girl saw her brother who had hit Donald and together they hurried to the corner of the street, forgetting him. He followed because everyone was going away in one direction or another.

At the corner: late arrivals following a group of yonderboys who had equipped themselves with sticks and big empty cans to make drums of, and howling with joy on seeing the stuck prowlie.

"Gas!"

The shouting faltered. There was a store across the road which had been open under automated supervision; the owner or manager had turned up and was hastily slamming the wire grilles over the display windows and the entrance, trapping three customers who seemed relieved rather than annoyed. An anonymous hand flung a rock through the last exposed window, which happened to have a liquor stand behind it. Cans and bottles thundered down, a heap of the former jammed the grille before it could rise and lock in place, and several of the crowd decided that was a better target than the prowlie.

Overhead a roaring noise. One of the tiny one-man 'copters capable of being manoeuvred between the tops of the high buildings and the Fuller Dome, whose blushing underside formed Manhattan's sky, was scouting the scene to notify police headquarters of the extent of the disturbance. From a skylight somewhere away to the right there came a bang—an old-fashioned sporting gun. The 'copter wobbled and came down into the middle of the street, vanes screaming as the pilot fought for altitude. Mad with delight at having a fuzzy-wuzzy delivered into their hands the crowd went forward to greet him with clubs.

Donald fled.

On the next corner he found riot containment procedure already under way. Two water-trucks with hoses going were methodically washing people off the sidewalks into doorways. He turned at hazard in the opposite direction and shortly encountered sweep-trucks, paddywagons adapted with big snowplough-like arms on either side, serving the same purpose as the hoses but much less gentle. Keeping the crowd on the move was supposed to take away the chance of their organising into coherent resistance. Also another one-man 'copter droned down and started shedding gas-grenades into the street.

He was one of about fifty people being hustled and driven ahead of the official vehicles because they were off their own manor and had no place to go. He worked his way towards the wall of the building because some people, he saw, were dodging into hallways and vanishing, but at the first door he came close enough to to stand a fair chance of entering there were two Aframs armed with clubs who said, "You don't live here, WASP —blast off before you get stung."

At an intersection two hose-trucks and the sweep-truck he was running from coincided. A mass of people from all three streets was shoved into the fourth, taking them back towards the focus of the trouble. Now they were body to body, stumbling on each other's heels and shrieking.

The prowlie was still stuck where it had been. Its driver sounded a blast of welcome to his colleagues in the sweep-truck. The gas had mostly dispersed, leaving victims choking and vomiting, but there was no end in sight to the riot. On the concrete arms of the playground men and women were still bellowing the song that the girl with the electronic accordion thundered out for them: "*Find you a hammer and SMASH IT DOWN!*" Virtually every window had been broken and glass crunched underfoot. The human beings were being shovelled together with the garbage into one vast rubbish pile, not only in the direction from which Donald was coming but from the other end of the street as well. The stock plan had been applied: close the area, keep 'em moving, jam 'em together and pack them off.

Adventurous mind-present youths jumped up on the arms of the sweep-truck as it passed the adventure playground and from there leapt to the security of the random concrete branches. Donald was too late to copy

them; by the time he thought of it he had been forced on by.

Mindlessly he pushed and thrust and shouted like everyone else, hardly noticing whether it was a man or a woman he jostled, an Afram or a WASP. The gas-gun on the sweep-truck discharged grenades over his head and the booming music died in mid-chord. A whiff of the gas reached Donald's nose and wiped away the last traces of rationality. Both arms flailing, careless of who hit him so long as he could hit back, he struggled towards the people from the opposite direction now impacting on the group he was enmeshed with.

Settling on the roofs with a howl of turbines: paddy-copters to net and carry off the rioters, like some obscene cross between a spider and a vulture. He sobbed and gasped and punched and kicked and did not feel the answering blows. A dark face rose before his eyes and seemed familiar and all he could think of was the boy he had fired his Jettigun at, the one whose sister had attacked him in retaliation so that he struck her in the mouth and made her bleed. Terrified, he began to batter at the man confronting him.

"Donald! Stop it, Donald—*stop it*!"

More gas rained down from crunching grenades. He lost the energy needed to drive his fists and a modicum of sanity returned to him before he blacked out. He said, "Norman. Oh my God. Norman. I'm so—"

The apology, the recipient, the speaker, whirled together into nothing.

The Happening World (7)
The State of the Art

I SAW SCRAWLED on the corner of a wall scrawawawled on a wawawall caterwauled cattycorner on the wawall what did I see scrawled on the wawl I forget so it can't be that important KNOW IN YOUR OWN HANDS WITH A POLYFORMING KIT THE SENSATIONS OF MICHELANGELO AND MOORE OF RODIN AND ROUAULT *let us analyse your metabolism and compound for you a mixture that's yours and yours alone guaranteed to trip you higher further longer* by cross-breeding the kaleidoscope with the computer we created the Colliderscope that turns your drab daily environment into a marvellous mystery HE THAT HATH EARS TO HEAR LET HIM HEAR ALL THERE IS IN THE RANDOM SOUNDS OF A WHYTE NOYSE (R) GENERATOR tomorrow's architecture will be a thing of space volume introversion and compaction BEETHOVEN VIOLIN CONCERTO SOLOIST ERICH MUNK-GREEN *when you're redecorating don't forget to consult us for original computer-created artworks to complement your colour-scheme* rare exotic taste sensations from the most ordinary food if you dredge it with a little "Ass-salt" before cooking THE LATEST PLANETARY COLLISION SIZE SMASH OF THE EM THIRTY-ONES IS ON SPOOL EG92745 *if you haven't read it you haven't celebrated your twenty-first "gives a totally new meaning to the term 'novel'!"* NETSUKE WAS NEVER LIKE THIS BEFORE THE TEXTURES THE FORMS ARE ENDLESSLY ABSORBING THOUGH NOT HABIT-FORMING (G'TEED) one of the great creative artists of our generation is responsible for clothes by "Gondola" MACBETH OF MOONBASE ZERO BY WILLIAM SHAKESPEARE AND HANK SODLEY *freevent tonite pyrotechnics and ample opportunity for self-expression bring your own hatreds* you mean you haven't yet bought one of Ed Ferlingham's time-boxettes? *make your home a frame for your individuality* WE THE MARIONETTES A NEW BALLET BY SHAUN *the most fascinating pursuit of this century is to study the stochastic potential of English "verbal Karezza because it always seems almost to be there and never makes it"* THE GREATEST ART IS THE MOST NEGLECTED WHEN DID YOU LAST EXPERIENCE ECSTASY IN BED? *at the 22nd Century Gallery now wear your oldest clothes or buy our unique disposables or come buff to "shit-shower" by Alan Zelgin* at last perfume achieves the status of true art in the delicate flagons of Twenty-first Scentury by Arpège TONIGHT ON CHANNEL FIFTY IN THE PERFECTION OF HOLOGRAPHIC SOLIDITY *polychrome enigmata by The Triple at Shoplace Shoplace Shoplace* LOVE YOUR DISINTEGRATIVE TENDENCIES AND GET US TO HELP THEM ALONG antiques you've never seen before because we invented them and there are lots and lots how about a Balinese hubcap or a non-genuine art nouveau hi-fi set? *learn the Zock with that true accustomed-to-free-fall touch at our studios* THEATRE IN THE HOLE PRESENTS WAGNER'S LOW END GRIN the autoshout for intellectuals fitted free of charge to your set EXPERIENCE "STENCH" BY QUATROMANE FULL DIRECTIONS AVAILABLE *never be bored by the pop-parade Tonvaria makes them over in the style you love from Bach to Beiderbecke to Bronstein to whoever* WHEN WE SAY SENSATIONAL WE MEAN IT HEIGHTEN ALL YOUR PERCEPTIONS WITH MILD, NON-ADDICTIVE sick and tired of it all send for us example $100 for invasion of apt by 3 with paint and buckets of dreck $500 for armed hold-up and theft of all movables with dialogue and max. damage to fixtures special quotations up to $2000 *at last gastronomy acquires the status of true art at the hands of Noël Noël* OUR CANS ARE INDIVIDUALLY DESIGNED BY SOME OF TODAY'S GREAT CREATIVE ARTISTS you too can exploit your artistic potential with one of our personalised courses BE THE ONLY PERSON ON YOUR BLOCK TO READ THESE STORIES ON HAND-TOOLED VELLUM WITH BEAUTIFUL CALLIGRAPHY *at last that neglected sense of touch can enjoy the fruits of a great artist's creativity get "Stingle"* (R) HAVE YOU PAINTED "CHRIST STOPPED AT EMMAUS"

YET? throw that old camera on the dreck-pile and get with the holographic trend LIMITED EDITION OF ONE MILLION NUMBERED COPIES *we can re-programme your life to make an artistically rounded whole* WHEN THEY SAY BOTTICELLI DO YOU THINK IT'S A CHEESE WELL AS OF TODAY IT IS AND GASTRONOMES ACKNOWLEDGE OUR ACHIEVEMENT *School of Free Television presents* a black blind journey into wherever is theme of freevent tomoro *Museum of Last Week exhibition changes daily* THE ART OF THE BLUE MOVIE LECTURE WITH REAL FILM NOT TAPED REPRODUCTIONS at last television's potential is realised in the hands of a great creative artist *how have your dreams been lately and it's not your shrinker asking but the people who've taken the sleep-inducer the next logical step* at last dress assumes its rightful status among the creative arts at the hands of A TRUE CREATIVE ARTIST IN THE FIELD OF COSMETIC SURGERY IS DR. don't waste the chance to make your family a work of ART OF SUCCESS CALL AND INQUIRE *you'll appreciate not hate what the world offers when you* VOLUNTEER DICTY FOR FREEVENT WITH 24-HOUR SENSORY INTERFERENCE decorative shells rocks relics LIVING NOVEL COME AND INTERACT WITH THE AUTHOR OF breaking apart is another aspect of the whole not art not life but experience *match your pets to your personality genotype-moulded animals of all descriptions* AT LAST THE STATUS OF TRUE CREATIVE ART IS CONFERRED ON re-arrangement of your experience into a symmetrical pattern YOUR END TOO CAN BE A WORK OF ART CONCEIVED BY YOURSELF ALL TRADITIONAL FORMS OF EXECUTION AVAILABLE IN RIGOROUSLY ACCURATE HISTORICAL DETAIL EXPLOSION DROWNING PRECIPITATION FROM HEIGHT ALL WEAPONS SELF- OR OTHER-DIRECTED REASONABLE TERMS FROM TERMINATION INC. THE COMPANY THAT MAKES AN ART OF YOUR END FOR YOU (not legal in following states. . .).

(ART.—A friend of mine in Tulsa, Okla., when I was about eleven years old. I'd be interested to hear from him. There are so many pseudos around taking his name in vain.

—*The Hipcrime Vocab* by Chad C. Mulligan).

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after galactic war

—from a road on earth

michael butterworth

the road wound along under the night sky
set in the sky
were the crystals of the ships that had been broken
each chip was a silent
last fleck of humanity
together with the vanity of the ground
which bent up to meet them the
space beyond buckled inwards under the
pressure of the true stars and
sandwiched the chips into bars of space music

they needed no air
were archaic flowers off the rings of all dead girls
gems centered the jewelled scene into curls
in the front of my head
i looked out of the forehead
of a doubledecker bus
and my legs were wheels
i rolled over the pitted road pickpocketing the night
i rode the night like a baby stalk lost in Heaven
not seven anymore
wondering why

wine ON AN EMPTY STOMACH

by George Collyn

A Literary Plethora

"THE REPETITIVE PATTERN of boom and slump set up, of its own momentum, an oscillation within the financial structure of the economy which, by its progressive intensity, ultimately destroyed that structure." Which is how the economists explained the downfall of a society based upon technology and commerce. The sour-fruit taste of a nation sliding into chaos is always made more palatable by the sweet sauce of academic explanation.

The military junta, who threw out the politicians, had their own explanation: "The government," they said, "made a balls-up." Which was explicit without being explanatory. No one ever explained the series of councils, juntas and messianic societies which replaced, succeeded and overthrew one another until all effective government was destroyed.

No one ever explained the phenomenon satisfactorily. But that does not mean there were not innumerable attempts to do so. There were, in fact, as many explanations as there were opinion-holding individuals in the country. In the last dying kick of a failing culture it seemed as though half the population was engaged in writing books to explain the current situation to the remaining fifty per cent.

Learned dissertations came rolling off the presses with such frequency that, at one time, the world of publishing was the only viable industry in the whole of Britain. For there was no lack of a market. Each person engaged in writing had to read all other theses in order to frame his own arguments in criticism of the work of others. Even after the contribution was written, it was necessary to prolong one's reading in order to know what criticism was being made of it. For the act of writing did not end with one's first publication. One must later recapitulate and defend.

The fortunes of publishing houses were made and lost in the phased popularity stakes of their pledged authors. Internecine rivalry was piratical in its ferocity and many respected names went under in the cut-throat schedules of the boom era when a book was conceived on Monday, written on Tuesday, printed on Wednesday, distributed on Thursday, sold on Friday, remaindered on Saturday.

One day the scribblers of the world woke to find that the events they had been prophesying had long since passed by. Suddenly, the world was too busy fighting for its daily bread to think of food for the mind.

JAMES, TED AND Messrs. Hillary and Miller used to argue about the extent to which these books had influenced events. James used to argue that no harm ever came out of increased knowledge and that the fault lay with gullible men who read meanings into books which were not there in the first place. But Ted used to say that most people would have had no ideas at all, if the books had not put them into their minds. The Messrs. Hillary and Miller used to be part, and yet not part, of the debates. They would sit on the sidelines, slapping their fat thighs with excitement, as they

were provided with the controversy they craved. From time to time, as one or other of the disputants weakened in the case he was putting, the two spectators would join in on the side of the losing contender in order that the fury of the contest might be renewed. Their presence was a catalyst as neutral as petrol poured on to a roaring flame.

In the contemplative calm which followed the verbal battle, Mr. Hillary and Mr. Miller would discuss points raised and points countered with the partisan spirit of sport enthusiasts.

The arrival of Soldier put an effective end to these verbal encounters because—not only did Soldier know more about the inner convolutions of the Crash—not only was he, by his soldiering, partly responsible for bringing it about—but he had, by his own admission, never read a book in his life. On the winter evening that Soldier entered the Miller household for the first time, all four men turned against him as representing the military forces which had destroyed the nation. He was a man of violence, they said, and they all knew that violence begets violence. Even James, who was his sponsor into their circle, was the most virulent in leading the attack on him.

If he was a scapegoat to them, he was also a hero by reason of the fecundity of his imagination. The hydra-headed monster of debate faded away from Mr. Miller's literary gatherings and they became a solo and virtuoso recital by Soldier. This was the light side of Soldier's nature. He also had a darker side; as he had shown on his arrival in the community.

The Debrutalisation of a Licentious Soldier

NO ONE COULD quite remember Soldier's arrival. One day he was demonstrably not there. The next day, as equally obviously, he was. To a countryside grown accustomed to the march and counter-march of mutinous armies, the presence of an armed man was a fatal canker to the community. Children hid their faces in their mother's skirts as he passed by and men spat on the ground over which he had walked.

Blind to his aura, Soldier was quite charmed with the place; he wanted nothing more than to settle there for ever, sure in his own mind that the food and clothing thrust upon him were given out of the goodness of people's hearts rather than from the fear he had inspired in them. And he had lived there for three days without knowing that Mayor Tom Ferens had said, "Every man has his price. We can tame this man once we know what it is he most requires." But it was a little hard to see what the community could provide, living as it did on the line which divides poverty from starvation. They watched Soldier for a clue.

Not knowing this but probably grasping it with some sixth sense, Soldier let it be realised that he was a man easily overcome by carnal lusts. During his days in the army he had tried to live the life sane and celibate—a contradiction in terms which is only possible for the pure in heart, the sterile in mind and those obsessed by hygiene. Once he had deserted from the defeated Army of Essex it was easy to forget such unthinking principles. It was an amnesia aided by the fact that the

village of his adoption was a place where, not only were the girls as beautiful as the dreams of puberty, but where marriage and divorce were the only readily available commodity. Tom Ferens was priest, law-maker, lawyer and registrar, all in one body. He was ready to marry and unmarry the soldier as many times a day as Soldier's gonads or the availability of village maidens would allow. At the end of a week Soldier had so made up past leeway that his shoulders were buckling under the weight of his shirt and a babe-in-arms would have made him a formidable opponent.

It was this outpouring of energy and the consequent satiation which turned Soldier from a primarily physical man into someone basically spiritual. It was James who first recognised his gift and introduced him into the literary ambience of the Miller household where Soldier's story-telling abilities began to flower. He told tales of the Army of Essex, under the leadership of One-Eye MacPherson. Soldier had seen so many things, been to so many places in all imaginable parts of the country.

"The Vale of Langworth," he said, for example, "is completely surrounded by hills so steep that it is effectively blocked off from the outside world as if by walls. At only one point is there a break in a cliff where a stream gushes forth with such fury that no one has been able to walk up it against the force of the current. No one has ever seen them but anyone will tell you that the people of the valley are the richest and best-fed people in the country. This we knew from the quality and quantity of the discarded articles which were washed out of the valley in the stream."

"And you tried to get into this place?" asked Mr. Hillary.

"Yes. For a year and a day. Then One-Eye got fed up and marched us off to London."

No one knew whether to believe Soldier or not. Except James who, with his all-embracing admiration of creativity, wanted to believe everything a story-teller of merit could tell him. For Ted and the others the illusions of grandeur which permeated the tales were crumbling mortar in the facade of credulity.

"I once had a dream," said Soldier, "which told me just how Britain could be re-united."

"That must have been quite a dream," said Ted.

"It was," Soldier replied, "I slept three days and three nights while it lasted. It was only the noise of a shell which landed in the middle of our camp which woke me up."

"You must have been drunk at the time," said Ted —which was unkind; and probably true.

"Aren't you going to tell us what the dream said?" asked James.

"No," said Soldier. "I decided that the best person to make use of what I had to say was Captain Whitegrove, who controls three counties in the north. I swore I'd never tell a soul until I'd seen him. I was on my way there when I stopped here."

"But you told us that you had finished with wandering. That you are going to settle down here," protested James.

"That's right."

"In that case you'll never see this man Whitegrove. You can tell us, surely."

"A soldier must keep to his oath," said Soldier the deserter and polygamist, and they could get no more out of him.

However, they continued to tolerate him for the brilliance of his language. He was accustomed to telling the stories of his adventures in the phrases customarily consecrated to the expression of affection. When he had used what he considered was a particularly telling phrase he would halt his narrative and roll the phrase over a mental tongue in the recesses of his mind, tasting every nuance.

"To promote all the squeeze possibilities of the siege . . . (long pause)."

"It was not long before we could hear the brisk vibrations of approaching men . . . (long pause)."

While he paused his audience would sit with rapt attention on their faces, waiting in agonised silence for the renewed flood of words which would release the spell.

"You know, Soldier," said James in all seriousness, "you should write a book."

Everyone laughed at this because books were James' obsession. But James surprised a thoughtful look on Soldier's face. And James himself grew thoughtful. Because literature was the one subject to which he devoted a great deal of thought.

Reality is an Arctic Blast

JAMES FOSTER HAD been an individual so repulsed by the reality of life that his existence had become devoted to escape from that reality. As a child his taste for reading matter had been so catholic that his parents had been forced to dress the corn flakes packet in a paper petticoat or they would discover James at the breakfast table, his spoon frozen in mid-air, his mesmerised gaze fixed on that portion of the packet which informed the world that the manufacturer's product was made from corn harvested at the peak of its sun-given goodness and that they were purveyors of cereals to royalty by appointment.

James' love of literature was an all-embracing acceptance which had a certain affinity with the ninth-century monk Nennius who made his history out of the palpably true, the obviously false and all the half-myths between —bringing them together uncritically like a great heap of stones.

Then came the Crash and a barren world dawned in which there were no more printed words. No one even bothered to write letters any more. By the time he entered his dotage it had been many years since he had last seen any form of writing apart from a few scribbled

notes or slogans chalked on a wall. But his memory of the printed page obsessed him. He sat in a corner by himself with his head full of verses and half-remembered quotations, bewailing the destruction of the world's libraries; from the Sack of Constantinople in the fourteenth century to the bombing of the British Museum in his own lifetime.

His daughter cursed him as she bustled about the kitchen, stumbling over his legs as she carried pots to the stove or plates to the table, not able to raise her eyes from her work without meeting the vacant arrow of his gaze.

"Books, books," she would cry, "what do you want to go bothering about books for? Books got us into this mess but they'll never get us out of it. Why don't you get out into the fields and do something to earn your keep? You sit and dream all day and expect us to keep you. Do something useful or die. Better men than you are dead."

But he didn't feel like getting round to dying just yet. He went to Mr. Hillary instead.

Hillary was a somewhat handsome man, if rather feline in appearance. As a legacy of the days before the Crash, he carried the label of a man of taste and together with Tom Ferens and Mr. Miller was one of the trefoliate bastions of respectability in a community which, since it had learned to govern itself, had had to create its own nobility. He was one of the two men Tom Ferens did not dare to order into the fields during a difficult harvest and his was one of the two houses which were not crowded with refugees sleeping three to a bed.

James went to him with the idea that a man of such fastidious habits might well have preserved some of the books he must have owned. Mr. Hillary, however, had belonged to an intellectual circle which considered it better to be thought well-read rather than to have read, and he had gained all his literary knowledge from the supplements of the Sunday newspapers. But he made James a present of a suitcase full of letters and made available a small chamber he dignified with the name of reading-room since the plumbing no longer functioned.

James worked his way through the case with singular devotion. There were love letters, affectionate letters, letters of application and resignation, poison-pen letters and pornographic graffiti, begging letters, half-completed football pools coupons, bills and sales literature, thank-you notes and invitations. It was all reading matter, fodder for the mind and grist for the mill. James read them all, categorising them and annotating as he went—his vision fixed on a calf-bound volume entitled 'Domestic Correspondence in Great Britain Prior to the Great Crash'.

He spent so much time with the letters and dwelt so long on the most intimate details of the lives of strangers that his mind began to give. He began to have nightmares about the vagaries of individual handwriting and his nights were so restless that his daughter refused to keep him any longer. There was an idle mouth in her house she said, while, every day able-bodied strangers were streaming along the road through the village and only passing on because there was no space in which to sleep. She would rather have one of those in the spare bed than her mad father. Mr. Hillary had made him like this and he should learn to live with what he had made. One day James found his belongings on the Hillary doorstep, wrapped in a blanket and with a note reading—

Dear Dad,

If he can keep you in the day, he can keep you at night,

Love,

Janet.

It would be much better if we never knew our children. An incubator has no feelings, so it can never be hurt.

Mr. Hillary was horrified but so bemused that he accepted his lodger without protest. But he was a man with a taste for silence and the shouts and screams which nightly filled the corridors of his house, distressed him. At length he was so fine-strung in his sanity that he went for advice to the only seat of authority he knew.

Tom Ferens knew that Sally Fenton was waiting for him in his bedroom. Nevertheless, when Mr. Hillary came to plead James' case, the mayor lent an attentive ear.

As Hillary explained, James was a habitual and addicted reader who had been deprived for too long of the only drug he knew. When he had been faced with Mr. Hillary's box of letters, he had tried to absorb too much, too quickly. "Some of those letters," Hillary explained, "are expressions of the wildest emotions and are mostly written in an atrocious style. James has got mental indigestion."

Tom listened patiently.

"I don't know what I have in my library," he said, "but I have some books which belonged to my grandfather. He was a man of the most impeccable taste. I should imagine that James will find them most soothing to read."

James' next home therefore was the former inn that was town-hall, parliament house and presidential palace. He slept in the snug on a camp bed under the bar where Tom Ferens kept the small bookcase which contained his library. But when he came to read the books he was disappointed. He had only wanted humble reading matter, not the esoteric. In a world where any book was rare he got books which were rare even before the libraries had burnt. There was a Geneva Bible, a sixteenth-century Herbal, a copy of Pope's *Iliad*, two volumes of The Rambler (one without its cover), assorted literary criticism and a whole shelf full of nineteenth-century sermons. He read them, of course, as any man would partake who was invited to a banquet. But he would have been happier with simpler fare.

Ultimately his literary peregrenations led him to, and

ended with, Mr. Miller's famous copy of *The Times.*

Impingement Upon a Bachelor Stronghold

SAMUEL MILLER HAD a small, symmetrical cottage on the very outskirts of the village, where he mostly remained in a state of seclusion bordering on reclusion. He deliberately held himself aloof from the mainstream of village life in order that his stoutly maintained celibacy might not be threatened. For Miller held that the indulgence of the sexual urge was a prime cause of the disparity between a man's expectation of life and a woman's. It was only natural, he said, that giving away part of oneself, one also lost part of one's lifestream.

This was but one of many strange beliefs that Miller held as a result of his vocation as amateur philosopher. He thought so much in the quiet isolation of his home and dreamed up so many singular notions that he used to proclaim that he received the surplus thoughts of other, busier people who cast off those thoughts they were too busy to attend to into some strange etherical medium, from whence they were plucked by Miller's receptive mind.

For Mr. Miller the world had stopped on the Wednesday that *The Times* had appeared as a four-page broadsheet which bore on its front cover the bleak message announcing its termination of publication. It was such an unthinkable event that, for Mr. Miller, that day never happened and he woke perpetually into the Tuesday which preceded it.

Each morning he would rise and take the yellowing copy of Tuesday's *Times* from the hall-table and, while the kettle boiled for his breakfast coffee, he would peruse the news, tut-tutting his tongue at news of strikes, riots, rebellions, mutinies, failures and shortages which each represented part of the culminating implosion of the pre-Crash world. At five to eight each morning, just before the sight of the empty coffee-jar served to remind him, he would switch on the radio for the eight o'clock news. The silence from the set would drag him screaming into reality. Regretfully he would remove the kettle from the imaginary gas-jet, fold the paper neatly and replace it on the hall table where it would wait until his hypnogenitive coma of the following morning.

James loved Mr. Miller with the nearest thing to pure love one man can feel for the mind of another. The literary promise inherent in his yellowing newsprint entranced James and, with the joint aid of a doe-eyed innocence and the near-mandatory authority of Tom Ferens, he thrust aside Mr. Miller's agonised protests and took up residence in the cosy little attic room beneath the starling-infested thatch.

Within a week the shock therapy promoted by his arrival had turned Mr. Miller's psychosis along new pathways and the host was infected by his guest's enthusiasms. Together they instituted the weekly study sessions with Ted and Mr. Hillary and James settled into, what for him, was the happiest time of his life.

James used to surround his bed with scraps of paper bearing mottoes, thoughts and remembered quotations. The scraps lay pinned to the wall so thickly, sometimes on top of one another, that it was impossible to see the wall beneath. And when the door was opened and a breeze stirred the room, the whole wall came to life, fluttering and flapping its hundreds of wings as though it would fly away.

James used to say that the places where one thought best were when walking, sitting on the lavatory or lying in bed—and he liked to have his inspiration near to hand. Rugged scraps of paper and board bore, in laboriously masonry-like capitals, the fruit of his memory. His favourite he pinned to the centre of the wall at the foot of the bed. This read . . .

The World Is Without Comment.

James loved this passage fervently because it was so beautifully vague and incomprehensible. Not that he did not understand it. He could understand every single word. It was as a gestalt that the passage was totally without meaning. Quite the reverse was the quotation he kept at the head of the bed and which was his second favourite of them all. This read . . .

The head of the military junta is a *

. . . which explained everything but was not explanatory.

In this room, surrounded by such gems of wisdom, a new concept emerged in his mind. This brought together his dreams of a cultural revolution, his belief in Soldier's talent and a vision of his influence spreading, through Soldier, to permeate generations yet to come.

Dinner for Six, Please James

JAMES GAVE A dinner to announce the dawn of a cultural renaissance, besides which the flowering of Medici Florence would pale like a candle in the sun. His friends discounted such claims but they were aware that James had conducted prolonged negotiations with the food-smugglers of White Horse Vale. If James wished to nurture their minds, they had a primary duty to their stomachs.

The dinner was to be held at Mr. Miller's of course and all of James' particular friends were invited—Mr. Hillary and Soldier, Ted and Sally Fenton. The last was invited, not so much because she was a friend of James, but because Ted was trying to get her to marry him at that time, and the pursuit was so vital to his happiness that he could not bear to sacrifice any moment which might be used to further that end.

They had turkey for dinner and that was pretty good. After it was done they sat back in their chairs and watched James. During the meal he had waited on them himself, strutting about happily with a gratified smile on

his face. He had kept on strutting even after the last, fragrant, white morsel had followed its predecessors. But, after a while, his feet began to ache from all the walking he had done. He stood and looked at them with the half-smile of an aged Apollo twitching his triangular mouth. He kept giving his head a doleful but mocking shake and they thought they had never seen him in such spirits.

"The time has come," he said, "when the world must be set on its feet. And we shall do the setting."

He was alight with the intoxication of his vision and his audience was asleep with the stupour of their full stomachs. Together they were swept into a dreamland which pivoted on the remote possibility of Soldier's fulfilling James' plan for him—which was to write a book.

An Almost-Love Affair

SOMETHING HAD TO be done to take the peoples' minds off the failing wheat crop. The blight was gaining ground despite the perfect weather.

Under the influence of James' burgeoning cultural revolution, the community invited a team of strolling players to the village. For many of them it was the first example of mass entertainment they had seen since the electricity generating stations had died and the telly-pictures faded.

Sally took Ted with her to hold her hand. She still hadn't made up her mind about their relationship. He was good company on a walk but she was less certain of what sort of company he would be in bed. So far she had not even let him kiss her. She pleaded, as an excuse, her dislike for his beard, which was black, curly and very wiry, like the springs of a decayed mattress.

The play, if play it could be called, was aphrodisiac enough, being earthy, primitive and basic. Standing on a platform that was also the waggon on which they transported their few props, the narrator told a simple bawdy tale of lust and cuckoldry. He himself looked vaguely like a distressed curate, all Adam's apple and myopic gaze. But his choice of words was unclerical. During the course of the piece, the skirts of bending women were thrown up to reveal bare bottoms, comedians wore wooden phalluses strapped to their waists and men dressed as women chased girls dressed as boys. It had the vaguely Grecian air of an Athenian Dionysia.

That night half the girls in the village became pregnant under the inspired after-effects of the play. And a few days later, Ted burnt off his beard and Sally surrendered to him.

Ted was a devout hypochondriac by inclination and a malingerer by profession. He had brought the high art of work-shyness to such a peak of perfection that he could produce any desired symptom without undue physical exertion on his part. As he explained it to James, "A man cannot lift a heavy weight without flexing certain muscles. But he can flex those same muscles without having to lift a heavy weight. It must follow that, if a man can injure himself by attempting to lift too heavy a weight, he can do the same amount of damage to himself without actually having to do any weight-lifting." James felt that Ted had over-stated his case in assigning the ability to anyone. James thought that only a consummate artist in the skill of malingering could achieve the heights attained by Ted. For artist he was and, at the first sign of approaching work to which he might be called, Ted would, without leaving his bed, tense a muscle here, tighten a tendon there, thus ricking his back, or spraining his knee, or otherwise incapacitating himself.

Ted needed to spend so much time in bed because he was, like James and the Messrs. Hillary and Miller, a dreamer. Like them he recognised the fact that in a community as singularly futureless as was their village, a man's dreams were his only assured future. The trouble was that his more constructive thoughts were side-tracked by dreams of a more sensual nature. His mind tended to dwell on things like lying in bed on a cold winter's morning with the tip of one's nose freezing while the rest of one's body lies warm under the blankets. He also dreamed a great deal about the sweets and chocolates which had passed out of the world.

But, when he was not reflecting on the past glories of his taste-buds' feasting, he devoted many hours to the agonised question as to whether he should shave off his beard or no. The dilemma confronting him was Sally's refusal to have more than a casual relationship with him unless he presented himself clean-shaven. To any other man this problem would have been a simple choice of "No woman is worth it" or "I can't live without her no matter what the cost". To Ted, indecision was perpetually preferable to decision. Decision implied consequent action whereas indecision meant a man could stay in bed and think about it. Ted spent six months in thought before he dozed off near a candle and resolved all his problems by burning off all hirsute traces.

Now Sally Fenton was the village whore. There was no discredit involved in the title being given her. In many ways the post was as honourable and necessary as that of village blacksmith or teacher. She had been to bed with every man in the village except James, Mr. Miller and Ted. Mr. Hillary had slept with her and no more because he always went to sleep the minute his head hit the pillow and even Sally's presence had not prevented his physical make-up from following its inevitable course. James and Mr. Miller, both for different reasons, were outside consideration. But Ted she had not chosen to honour because she loved him and he loved her. As she said, she did not choose to mix business with pleasure.

So she went on her way, bringing a few moments of pleasure into the drab lives of the village men. She was so accepted for what she did that the wives of the village did not bother to resent it if they knew it was

Sally their menfolk were seeing. Women who would be homicidally jealous if their husbands so much as looked at another women treated a visit to Sally Fenton with the same clinical disregard as, in better times, they might have greeted a visit to the dentist.

Ted ate out his heart with unrequited longings souring his expression. The look became so much a part of him that, after Sally had surrendered and he at last looked happy, many of his former friends walked past without recognising him.

After he had shaved off the cinder-like remnants of his beard he spent a great deal of time wondering how the hell he was going to tell Sally. He realised that, for Sally, his beard had been a useful excuse for avoiding a course of action she knew could hurt them both. Now, by his carelessness, he had removed that excuse.

He had, however, a self-destructive instinct. So he went to her and, with a voice rock-hard with a calm he did not feel, told her that she had better stop the trumped-up excuses and accept the inevitable. Sally was so surprised, as much by this sudden access of resolution as by his beardless state, that she weakened on the spot and was lost.

Thus was everybody made unhappy. Ted because he was afraid that Sally would revert eventually to her former mode of life. Sally because, after months of resisting honeyed words and gentle persuasion, she had given way to the first sentence spoken with determination. Everyone else because Sally was faithful to Ted, and men who had used Sally as the condiment of their existence found that some of the savour had gone out of life.

Only James was, in small measure, happy. He saw that, by his marriage, Ted was being transformed into the man of action James needed. James had conceived an idea, Soldier had given it form, now they needed an activist to translate the idea into positive reality.

The Religious Impregnation

THE MISSIONARY CARAVAN roved the land, progressing from one dying petrol station to another and, by this nomadic way of life, prolonging the existence of the internal combustion engine long past the point in time at which it might have been expected to become extinct. The movement of men and machines brought life to the stillness and so recalled the days when civilisation flourished in the guise of a perpetual traffic jam. The caravan toured from community to community preaching the same message—"Tend your fields; Raise your children; Rebuild civilisation in the sight of your homes". On their departure they left legends behind them because their leader was a woman they called the Lady Bella.

When she came to seek out Tom Ferens he was sitting on a bench in the sun with his back to the inn wall. As she came nearer he rose to his feet deferentially.

She was immense and swathed like an Egyptian mummy in bright-coloured fabric. Huge hoops of rings fell from the lobes of her ears to below the level of her shoulders, as if to provide leverage points whereby a man who wished to whisper in her ear could scale the Alpine slope of her breast. Her eyes were brown and softened by the gentle sorrow of an all-knowing, all-forgiving Mother. Those eyes have seen visions, he thought, they have seen kings and beggars, cathedrals and hovels, serried ranks of playing fountains. She was the personification of a mother-life principle as old as time.

She stretched her hand to where Venus shone in the sky. The light of the planet burned so bright that it seemed to swoop from the skies. And in its apparent approach it seemed as though twin eruptions of spume trailed in its wake like a double con-trail. It was Ashteroth-Karnaim come again for, as the Samoans say, Venus became wild and horns grew from her head.

The men and women of the village were duly impressed but none more so than Soldier. He, his inner eye feasting on the memory of Lady Bella, came upon James at a time, shortly after this, when his mind was at its most impressionable. The old man was trying, with the aid of an Anglo-Saxon dictionary, to read Cynewulf's *Elene* which, together with the dictionary, he had found in Tom Ferens' library. Soldier peered over his shoulder at the unfamiliar words:

fyrdrincas frome foron on luste
on Creca land, caseras bodan,
hilderincas hyrstum gewerede.

"What language is that?" asked Soldier.

"English," replied James. "Old English, but English."

"Is it? What does it say?"

"To tell the truth I don't rightly know. But it's about a Roman Emperor who sees a vision of a cross in the sky and is inspired to drive out the invaders and reunite his empire."

Soldier's eyes lit up. "That's it," he cried, "that's what my book will be about. A man who is inspired by the love of a woman and the visions she conjures up to reunite the country."

Soldier had never read a book and had no idea as to how long they should be. The only writing material he could find was an exercise book containing twenty-four pages. So, when he had filled all of these with writing, he thought he had done quite enough and proudly wrote "The End". It was quite a short book but it was every effective. It united the twin strands of Soldier's motivation. The inspiration that the person, words and visions of the Lady Bella had wrought on him on the one hand; his own dream of a united Britain on the other.

Ted's mind and ambition was a *tabula rasa*, a consciousness wide open and with "Welcome" written on the mat. After a lifetime of lethargy and indecision, his affair with Sally had flung him into a paroxysm of activity and he was ready to turn that untapped reservoir of energy towards some, as yet undefined, objec-

tive. In his mind he identified Soldier's heroine with Sally and the book became a clarion call to a messiah who would restore the rule of law and sanity to a re-united Britain. To Ted, persuaded by his triumph over Sally of his own charisma, that leader could be no one but himself.

The tragedy for Ted was that he believed himself and, caught up in his self-made web of illusion, his only salvation was to make good that illusion. With hallucinatory eyes he stared out over the ruins of the world which, with the help of his friends, he was going to make flower again. Then, with a practicality inconsistent with his crumbling sanity, he went to Tom Ferens and spent a fortnight with him, learning all that the mayor could teach him about administration.

When he was satisfied that he was fully prepared he strode Moses-like through the village street, looking neither to right nor left, seemingly not caring, but knowing that those infected by the same virus as himself would follow him.

Our Chain Of Destiny

THEY SET OUT together, the race of men who should have been extinct but were not. Visionaries who wanted to build a reality to fit their vision. There was Soldier, fighter and poet of the new age; the Messrs. Hillary and Miller contributing to the embryo of an aristocratic intelligentsia; James, half-philosopher, half-court jester; Ted, priest-king of the New Jerusalem; and Sally, queen of the hive.

They came over the hills and found the city whose presence they had never suspected. The city and, beyond it, the sea.

The bulk of the city was long since vanished. But, in the dusk, they were afraid of that skeleton of a vanished community and they skirted it to emerge on to the beach. Below the wall of esplanade with its collapsing ice-cream stalls and buried memories of happy childhoods, they moved slowly across the sand, halfway between the transitory city and the eternal sea.

"This is it," said Ted. "A microcosm of the world. Here is where we shall build."

"On sand," said James ruminatively, but to himself.

Their sand was made up of grains of hopes and dreams which are insubstantial enough and which can never form a sure foundation since they cease to exist once they are realised. Their model society lasted for a year of quarrels, disagreements, suspicions, disappointments and clashes between incompatible personalities.

And it failed, of course, as it was predestined to do. The Messrs. Hillary and Miller, always rotund, wasted away — losing pounds with their hopes. In the final moments, when they knew that success was beyond them, it was Sally and James who broke under Ted's refusal to return to the village in the hills, and they sought escape—Sally in flight and James in heartbroken death.

Ted found Sally where the moon-track laid a silver highway across the recently saturated sand. Her form was dark in the gloom but her face gleamed pale in the moonglow and tears in her eyes sparkled in imitation of the prismatic reflections of the ocean. Her teeth shone ivory-white as her lips opened and shut in half-forgotten prayers.

A woman like this could only fall to the care of an ordinary man like himself under the duress of unusual circumstances and he knew he must justify his fortune. He stepped before her and fell on his knees in the wet sand. He placed the palms of his hands on her face, one on each side of her nose, and moved them to smooth back her tears until they mingled with the salt mist in her hair. His fingers met and locked in the tangle of her curls and, with her head held firmly, he bent and pressed his lips against hers.

"I can't go back. *We* can't go back," he murmured.

Sally said nothing, being faced with the choice which has always fallen to the women—whether to buttress the ambitions of their men or whether to face reality.

Meanwhile, at the end, Soldier bent low to catch James' last words.

"It's all finished, isn't it?" asked James.

"Yes," said Soldier.

"But it shouldn't be," said James. "It deserved to succeed. You'll have to write another book."

"I will," promised Soldier.

But he never did. He found it easier to live with the promise than the performance.

OFF-BEAT GENERATION

John W Gardner

PREDICTIONS ABOUT MAN'S future vary between extremes of optimism and pessimism. Catastrophic extermination by global war (nuclear or biological, accidental or premeditated) remains a favourite prognosis. Should we escape this but fail to solve the population problem, the prospects are scarcely less bleak, *vide* Sir Charles Darwin's *The Next Million Years*, in which he envisages a densely crowded world with a population permanently on the verge of starvation.

On the other hand, if we can stabilize world population, at say two or three times its present level, and learn to conduct our affairs without war, we have the prospect described in Professor Bernal's *World Without War* of up to ten thousand million (10^{10}) people enjoying a standard of life hitherto unattained even in the most advanced communities. Given the right conditions this "Technological Millennium" could become reality within the lifetime of today's schoolchildren. If we are to pull it off, what changes are predicated in world energy consumption, and in particular, how will the generation of electricity match the soaring demand?

At the present rate of consumption the world's known reserves of fossil fuels (coal, oil, natural gas) could keep us going for a thousand years. These resources seem pretty puny, however, when we are thinking in terms of a trebled world population with a per capita energy consumption probably exceeding that in the U.S.A. at the present time. The discovery of new deposits, and improvements in our utilization of existing deposits, can be at best palliative, and at worst illusory, serving to obscure the the ultimate need to harness nuclear and, possibly, solar energy on a vast scale.

Even if fossil fuels were not limited, their combustion on an ever increasing scale poses serious problems of atmospheric pollution. Moreover, particularly in our own densely populated island, problems of siting power stations will become acute as these increase in size and number.

Considerations of this kind, and the successful demonstration in spacecraft of some rather way-out and highly expensive, but clean and compact, electrical generators, have caused a recent upsurge of interest in what I like to call Off-beat Generation. The term has nothing to do with the Beat Generation (which has also received publicity of another kind!) but is a convenient, generic phrase embracing the whole array of unconventional proposals for electricity generation that have been lately urged upon us as desirable alternatives to the steam or gas turbine, or the diesel-electric generator.

The steam engine, in any of its various forms, is thermodynamically incurably wasteful. Whatever kind of fuel (nuclear or fossil) is used, its boilers can accept heat at only quite moderate temperatures. Internal combustion engines (like the diesel or petrol engine) employ much higher intake temperatures, but their outlet temperatures are also higher, so they do not effectively utilize all the extra heat; moreover they introduce other difficulties, particularly in regard to finding materials to stand up to these higher temperatures. Gas turbines operate at temperatures intermediate between those of steam and diesel engines and, not surprisingly, are subject to the same thermodynamic limitations on efficiency.

THE MOST EFFICIENT way of converting chemical energy into electricity is that employed in electrochemical cells, like the humble batteries used in transistor radios, flashlights, etc. When a fuel is burned in a furnace it combines with atmospheric oxygen and the chemical energy so liberated appears in the scrambled or random form which we recognize as heat. On the other hand, in the electrochemical cell electrons are released by the fuel at one electrode and travel across the cell to combine with oxygen at the other electrode. Their motion across the cell is directed, not random; moreover, since the electrons carry negative electric charge, their systematic drift across the cell constitutes an electric current. This current has been produced without the intermediate (and wasteful) conversion of chemical energy into heat. Hence, as a method of converting primary energy into electricity, electrochemical reactions are several times more efficient than methods using steam turbines and other heat engines.

Why, then, bother with heat engines at all? The traditional argument against large-scale electrochemical generation is its high cost: something like £2 per kilowatt-hour, compared with 1½d. (approx.) per kWh that we pay for domestic mains supply. At £2 per kWh a one-watt flashlight bulb still costs only about ½d. an hour to run, so at this level of consumption we do not notice the high cost per unit; but clearly flashlight batteries are economically out of court when we are thinking in terms of kilowatts or megawatts. Further, as we all know to our cost, such batteries have a genius for going flat just when they are most needed!

The limited life and high generation costs of dry cell batteries both stem from the fact that the current-

generating chemical reactions proceed by consuming the electrodes, which are necessarily made of some fairly expensive metal such as zinc, lead, nickel, or cadmium.

A promising variant of the primary battery is the *Fuel Cell*, which retains the inherent advantages of electrochemical generation without consuming its electrodes. In this (see Fig. 1) fuel, usually gaseous but occasionally liquid, is fed in continuously at one electrode, and oxidant (air or oxygen) at the other. Oxidation of the fuel within the cell generates electric current, just as in the dry battery. The oxidation products (again gaseous or liquid) are pumped away continuously to prevent "poisoning" of the cell, which will generate current continuously as long as fuel and oxidant are supplied. The rôle of the electrodes is essentially catalytic: they speed up the essential reaction without themselves being consumed (except inadvertently by slow corrosion).

At present the most highly developed fuel cell is the "hydrox" type, so called because *hy*drogen is *ox*idised in it (producing water as a waste product). For space applications, where cost is subordinate to lightness and compactness, this cell has already demonstrated its superiority. Suppose, for example, we require a 1-kW generator to run for 100 hours without attention and to be as light as possible. A battery of dry cells to meet these requirements would weigh 1,600 lbs., a hydrox cell and its fuel supply 260 lbs. For longer running periods the disparity in favour of the hydrox cell is even greater. Moreover, its "waste" product is pure water, which may be drunk by the astronauts, thereby conserving cargo space.

Is the fuel cell, then, the key to the Millennium? No: there are several cogent reasons why it cannot supply electricity on a truly vast scale. Hydrogen, of the purity required, is still a fairly expensive fuel. Other fuels, notably natural gas and oil, would obviously be cheaper but do not have hydrogen's rapid reaction rate and cannot be efficiently consumed in fuel cells. Technical advances—new electrode materials and design, higher operating temperatures and pressures—could change this; but from its very nature the fuel cell must always rely on fossil fuels, which we have seen are limited.

Even more limited are the known world reserves of platinum, or its chemically related metals, which are essential for fuel cell electrodes: nothing else seems to work as an effective catalyst for the electrochemical reactions involved, although this again is something that might be changed by technical advance. The restriction to fossil fuels, however, remains decisive.

A brief flowering, then, is what I predict for the fuel cell: it could supersede the petrol engine for a while, say during the first half the next century, but it will never be dominant in our global energy economy.

For all their thermodynamic inefficiency heat engines are not limited to fossil fuels: they may derive their heat from nuclear fuels, or from the sun's rays suitably concentrated by powerful mirrors (a technique now being seriously explored in Israel and other tropical countries). Even the thermodynamic limitation is no longer crippling if we go to high enough temperatures.

A steam turbine, with heat intake and exhaust temperatures around 600 and 100 degress Centigrade respectively, has a thermodynamic efficiency of about 46.5%. If we could find materials to stand up an intake temperature of 1,000 deg. C., this would correspond to 70% efficiency for the same exhaust temperature; and if we got really ambitious and tried for a 5,000 degree intake temperature we might think in terms of over 90% thermodynamic efficiency. The effect of intake temperature on efficiency is illustrated in Fig. 2; clearly a law of diminishing returns applies at extremely high temperatures but very worthwhile efficiency gains would accrue if we could push intake temperatures even to the 1,000 degree mark.

Thermodynamic efficiencies are those *theoretically* possible in a perfectly designed heat engine. Inevitably practical efficiencies are somewhat less but with good design they can come close to the theoretical maximum: for example, in a modern steam plant, over 40%

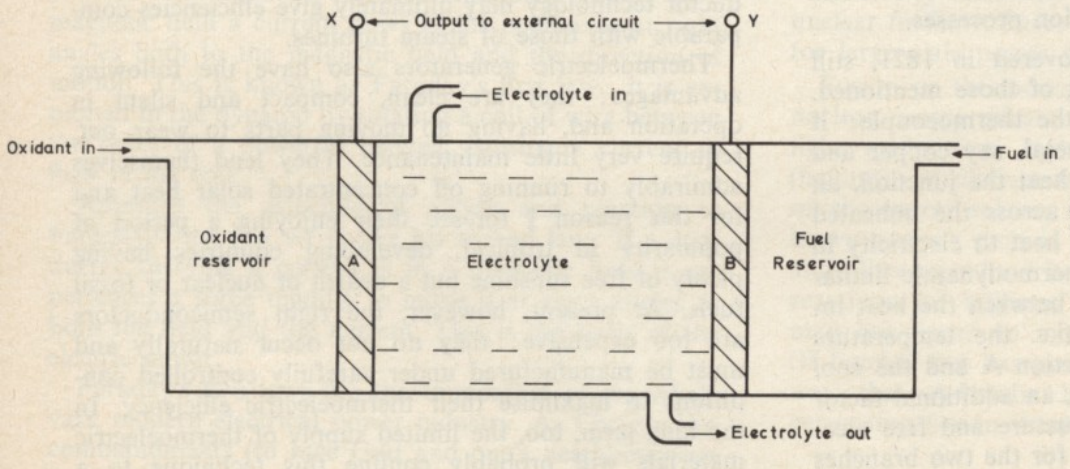


Fig. 1. Schematic diagram of typical fuel cell. The eletrolyte is circulated through a purifier to remove the reaction products.

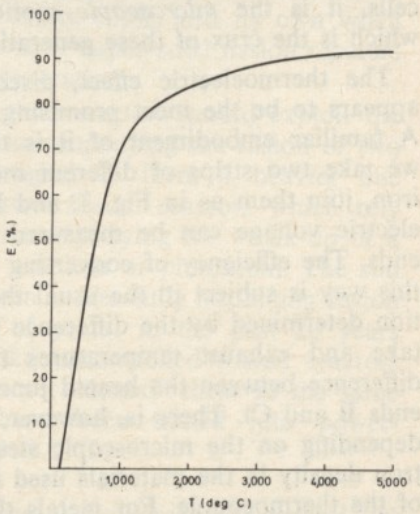


Fig. 2. Variation of thermodynamic efficiency (E) with intake temperature (T) for an exhaust temperature of 100 deg. C.

of the heat input does indeed emerge as electrical energy.

HOW CAN WE raise intake temperatures to take advantage of these higher thermodynamic efficiencies? Furnace temperatures of several thousand degrees are commonplace: the difficulty is to find materials to survive such temperatures for a useful time without melting, weakening or corroding.

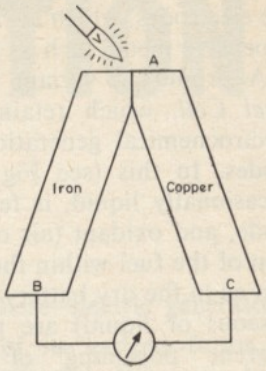
The problem becomes a little more tractable if we do not insist that the *moving* parts of a generator are exposed to such excessive temperatures. In steam turbines and other conventional generators certain mechanical parts move at speeds exceeding 1,000 m.p.h. Such speeds impose ferocious stresses on the parts, which must therefore meet stringent requirements of mechanical strength and durability. This in turn sets a limit to the operating temperature, since a metal heated even halfway to its melting point becomes significantly weakened by thermal fatigue.

On the other hand, the static parts of the generator are less severely stressed and can stand correspondingly higher temperatures. What we want, then, is a wholly static generator—a "black box" without mechanical moving parts, which will accept high temperature heat and convert it efficiently into electricity.

This line of thought has prompted much recent scouring through the byways of physics by hopefuls in search of ideas for off-beat generation. Surprisingly enough there are a number of physical effects, including some of quite respectable antiquity, which could in principle be employed: they go by such names as the *thermoelectric* effect, the *thermomagnetic* effect, the *calorelectric* effect, and so on. To produce these effects heat is applied to a solid, a liquid or a plasma (ionized gas) from which electric current is extracted as a result. In some cases it is necessary to impose a magnetic field on the material, but in no case is there any macroscopic, mechanical motion of heated parts: rather, as in fuel cells, it is the *microscopic* motion of free electrons which is the crux of these generation processes.

The thermoelectric effect, discovered in 1821, still appears to be the most promising of those mentioned. A familiar embodiment of it is the thermocouple: if we take two strips of different metal, say copper and iron, join them as in Fig. 3, and heat the junction, an electric voltage can be measured across the unheated ends. The efficiency of converting heat to electricity in this way is subject to the usual thermodynamic limitation determined by the difference between the heat intake and exhaust temperatures (i.e. the temperature difference between the heated junction A and the cool ends B and C). There is, however, an additional factor depending on the microscopic structure and free electron density in the materials used for the two branches of the thermocouple. For metals this factor is low and keeps the overall efficiency below 3% at all practicable temperatures. For electrical insulators the factor is also

figure 3



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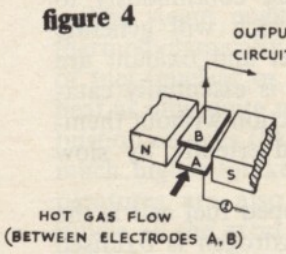

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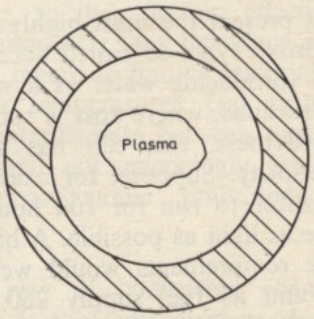
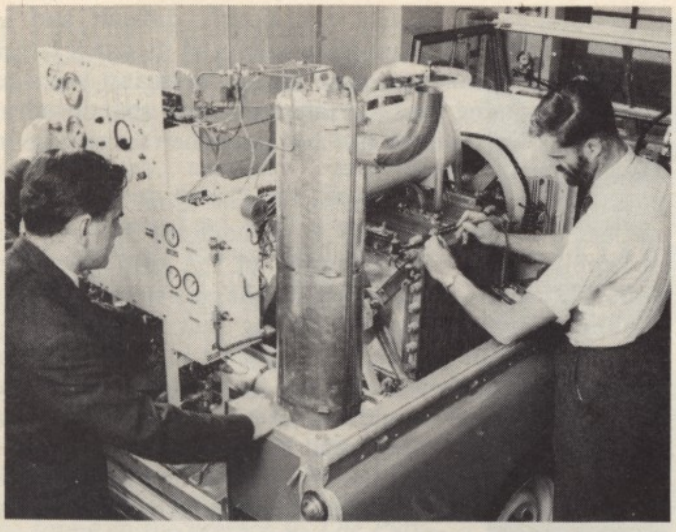
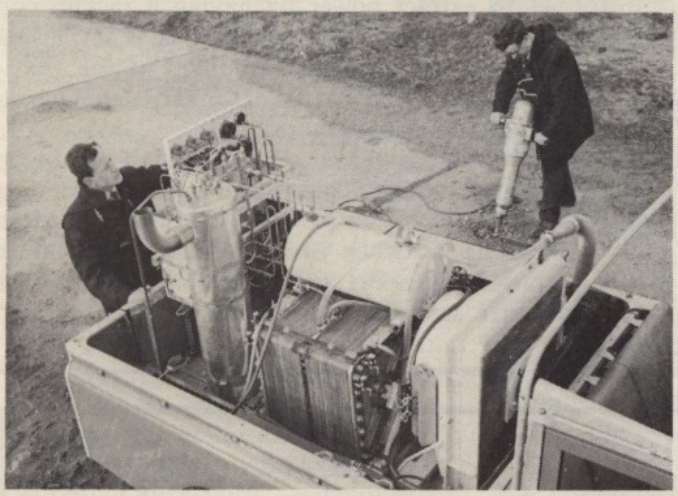


Fig. 3. Simple thermocouple: heat applied to A causes a voltage to appear between B and C.
Fig. 4. Schematic MHD generator: hot, ionized gas flows between the magnet pole-pieces, N, S and the electrodes A, B; current is drawn from the electrodes.
Fig. 5. Principle of magnetic containment: the plasma is surrounded by a region of strong magnetic field (shaded) and is repelled away from this into the central region of weak field. (For clarity the electromagnet coils have been omitted from the diagram.)

low, but for certain intermediate materials (semiconductors) the situation is more hopeful: nearly 20% has already been achieved and advances in semiconductor technology may ultimately give efficiencies comparable with those of steam turbines.

Thermoelectric generators also have the following advantages: they are clean, compact and silent in operation and, having no moving parts to wear out, require very little maintenance. They lend themselves admirably to running off concentrated solar heat and for this reason I foresee their enjoying a period of popularity in tropical, developing countries having plenty of free sunshine but a dearth of nuclear or fossil fuels. At present, however, the right semiconductors are too expensive: they do not occur naturally and must be manufactured under carefully controlled conditions to maximise their thermoelectric efficiency. In the long term, too, the limited supply of thermoelectric materials will probably confine this technique to a relatively modest position in relation to *magnetohydrodynamic* (MHD) generation, which is what I now wish to consider.





Methanol-air fuel cell developed by Shell research, installed as a self-contained unit in a Land Rover. The cell develops up to 5 kW.

Like thermoelectricity, the basic concept of MHD generation is well over a century old. Michael Faraday, working at the Royal Institution in the 1820s, discovered that when an electrical conductor moves in a magnetic field a current flows in the conductor at right angles both to the magnetic field and the direction of motion. This is known as Faraday's first law: it is exploited in the dynamo by rotating a coil of wire between the poles of a powerful magnet, causing a current to flow in the coil.

Applying the principle of action and reaction to Faraday's first law we derive his second law: if a conductor carrying a current is in a magnetic field it experiences a force tending to move it at right angles to both the field and the current. This is the basis of the electric motor.

Faraday's two laws are the foundation of the whole vast, modern electrical power industry. As Christ's two commandments (to love God and one's neighbour) are to the Christian religion, so are Faraday's laws to the science of electromagnetism.

Now there is nothing in Faraday's laws to require the conductor to be a solid. Faraday himself at one time considered using a liquid conductor, and there is much current interest in the idea of using hot, ionized gases for this purpose. The branch of science concerned with interactions between magnetic fields and electrically conducting liquids or gases is known variously as hydromagnetics, magnetohydrodynamics or simply (and mercifully!) just MHD.

Fig. 4 shows the essentials of an MHD generator: electrodes A, B are in contact with the hot gas-stream, in which is induced an electric current perpendicular to both the direction of flow and the magnetic field, in accordance with Faraday's first law. Strictly speaking this is not a static device in the same sense as the thermoelectric generator, for the (near sonic) velocity of the gas-stream is essential to the MHD generating mechanism. However, all the solid parts (duct walls, electrodes, etc.) are static and can therefore withstand higher temperatures than rapidly moving turbine blades. Even so, it is proving difficult to find duct and electrode materials to withstand the kind of temperatures required to maintain the gas in the electrically conducting state essential for efficient generation. (Electrical conductivity depends on there being an adequate supply of free electrons to carry the current. Below 2,000 deg. C. most electrons in gases are firmly attached to atoms; above this temperature the gas becomes increasingly ionized, i.e. electrons become detached from their parent atoms and able to move around independently.)

Current MHD research therefore aims both at developing suitable high temperature materials and at finding ways and means of keeping the gas electrically conducting at somewhat lower temperatures. A few hundred degrees drop in operating temperature could significantly ease the materials problems without too much sacrifice of thermodynamic efficiency.

For heating the gas either nuclear or fossil fuel may be employed, and both approaches are included in current studies. In the long run, as already emphasized, we must depend increasingly on nuclear fuels, and I believe that MHD will really come into its own when nuclear fusion reactors have superseded fission reactors for large-scale power generation.

Fusion or thermonuclear reactors would exploit the nuclear energy release accompanying the fusion of two light nuclei (e.g. hydrogen) to form a heavier one (helium), as distinct from fission reactors which rely on the energy release accompanying the break-up of a heavy nucleus such as uranium or plutonium. The sun and other stars have been successfully sustaining fusion reactions for millions of years; in the past 20 years man has learnt to make uncontrolled fusion reactors (H-bombs) but has not yet "tamed" these in the same way that A-bombs have been tamed into power-generating fission reactors.

BECAUSE OF THE enormous temperatures—around 100 million (10^8) deg. C.—required to sustain fusion reactions the technical problems involved are quite

different in kind and magnitude from those of fission reactors; but the potential rewards are correspondingly great. Nuclear fusion represents an even more concentrated form of energy than nuclear fission: H-bombs are more destructive than A-bombs, weight for weight. The fuel for fusion reactors, namely the hydrogen contained in the world's oceans, is trivially cheap and virtually inexhaustible. Even though reaction kinetics would probably dictate the use of the "rare" hydrogen isotope deuterium, it has been conjectured that there is enough of this in the Pacific Ocean alone to support the world's present rate of energy consumption for some 50 times the age of the universe; a comforting, if necessarily imprecise, statement. Furthermore, the final products of fusion reactions are virtually free from radioactive "ash". (Although radioactive waste disposal from fission reactors is at present a minor problem, compared with massive air pollution by fossil fuels, it could become a major problem as energy patterns change.)

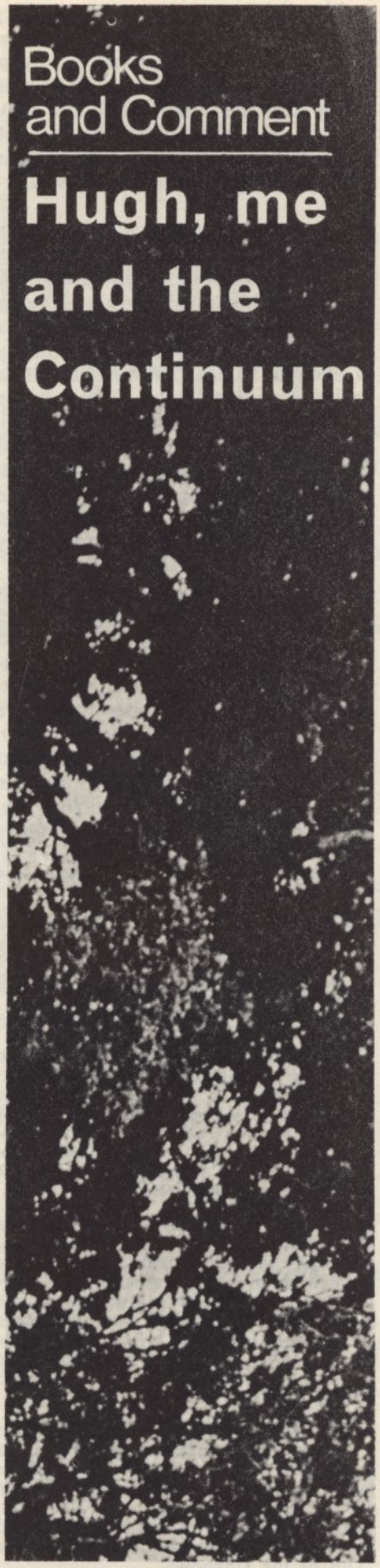
How does one contain a reacting mass of ionized gas (plasma) at 10^8 deg. C.? Any material container would of course be instantly vaporized at this temperature and the best hope seems to be magnetic containment exploiting the diamagnetism of the plasma, i.e. its tendency to move from the stronger to the weaker regions of a magnetic field. The principle of such containment is simple enough (Fig. 5) but the practical realization of magnetic fields of the right shape, size and duration is proving enormously difficult and is likely to occupy Culham laboratory and its much larger Russian and American equivalents for many years to come. (Assuming that the attempt is not abandoned at Culham, which would not be altogether surprising in view of recent cuts.)

The extraction of electric power from a thermonuclear plasma—once we have confined it—may be accomplished by an adaptation of the MHD principle, with the plasma itself replacing the gas-stream and its confining electromagnets replacing that shown in Fig. 4. Electrodes, of course, could not be inserted into the hot plasma but they would not be needed because the current generated would be alternating. (The plasma would be pulsating back and forth within its confined limits, not flowing unidirectionally as in Fig. 4.) With alternating current one can use the principle of the transformer to extract power by having a pickup coil near, but not in contact with, the plasma. The plasma is then in effect the primary "winding" of the transformer and the pickup coil is the secondary, from which power can be tapped as required.

Theoretical studies have already established the feasibility of this modified MHD technique for extracting the electrical power when we have our thermonuclear reactors working, so when that day dawns—20, 30 or 50 years hence?—I expect it to be the one favoured for generation on a scale befitting the Millennium.

Books and Comment

Hugh, me and the Continuum



LITTLE DID THE readers of a certain men's magazine suspect, in the middle years of the twentieth century, that they were party to a revolution. Yet it was so—in those glossy pages, modestly concealed between hairy tweeds and depilated dollies, a new kind of sf was being born. Slick sf, fearless and free of taboos, written by top-grade authors and paid for with real money. Sf that could stand up and be counted in any literary company, bar none. Sour and hardened sf addicts who have their own explanations for the current respectability of the genre may call for evidence to support this statement. The statement itself can be found in the preface to *The Playboy Book of Science Fiction and Fantasy* (Souvenir Press, 35s.). The evidence is less clear-cut. The handling of once-controversial subjects has become fairly commonplace, even within the confines of the specialized magazines, but the overall standard of literacy in the sf field still leaves something to be desired. (Witness, for example, the number of sf reviewers who cannot spell "Krafft-Ebing".)

Leaving aside questions of literacy and innovation, the thirty-two stories in this collection offer much good reading, beginning with George Langelaan's scientifically implausible but thoroughly horrifying "The Fly". Arthur C. Clarke is represented by two pieces concerning the perils of TV satellites; J. G. Ballard contributes "Souvenir", a story with a strange yet simple basic idea and innumerable overtones; Charles Beaumont, Avram Davidson, Theodore Sturgeon, Frederik Pohl are only a few of the familiar names on the contents page of a volume which will probably survive the claims of its editors.

Somewat less robust is the August Derleth offering, *Over The Edge* (Gollancz, 28s.). American author-editor Derleth has worked indefatigably to keep a spark of life in the often ailing body of fantasy publishing, and produced some notable anthologies, still among the best of their kind, at a time when such ventures were anything but lucrative. Of late, however, the blood has been running thinly, and several of the stories in *Over The Edge* scarcely justify the extravagance of hard covers. Among the more disappointing, because of the standard of work which their authors maintained during their comparatively brief careers, are William Hope Hodgson's "The Crew of The Lancing" and Robert E. Howard's "The Blue Flame of Vengeance". Neither writer's reputation will be enhanced by these previously unpublished works, and there is little in this anthology of horror more ghoulish than the assiduousness with which followers of certain authors patch together resurrected fragments of their idol's writings: the most generous construction which can be put upon their activities is that they are incapable of distinguishing between good and bad. When the graveyard school of fantasy eventually succumbs, it may be less from a stake through the heart than from a millstone around the neck.

The Tenth Galaxy Reader (Doubleday SF, 4 dollars 50 cents) is the thoroughly professional production to be expected of editor Frederik Pohl; his own story, "The Tunnel Under The World", is one of the lesser items among eleven tales of which Algis Budrys' "Wall of Crystal, Eye of Night", Brian Aldiss' "Heresies of the Huge God" and Poul Anderson's "Door To Anywhere" are the cream. Good, and for the most part fairly conventional, science-fiction.

Two short novels—one, Jack Vance's *The Last Castle*, is very short indeed—make up an Ace Double at 60 cents. *The Last Castle* features a typical Vance situation, with a small population of Earth-people inhabiting scattered castles at some period of the world's far future and discovering that the army of aliens who serve them have ambitions of their own. It is very weak Vance and inexplicably won a Nebula Award. The other novel is almost pure swashbuckle with a top-dressing of pseudo-science, and is a very much better buy: *World Of The Sleeper* by Tony Russell Wayman. Briefly, it concerns an American in the over-safe world of tomorrow (now *there's* a wild extrapolation!) who is given entry to the land of his own daydreams, which proves to be the rather unusual one of the thirteenth-century Malayan Archipelago. The fantasy element resides almost entirely in the method of transportation; once the dream-

world is reached, the plot follows a fairly routine princess — wicked ruler — dashing hero pattern. Nevertheless, it moves.

J. Cawthorn

INTER AND INTRA-SOCIETAL VIOLENCE

ONE OF THE ARGUMENTS that used to be bandied about by those readers of science fiction who sought to justify their taste in literature was that, although sf is essentially escapist literature, it is somewhat elevated above the common mass of westerns, whodunnits, etc., by attempting to deal with serious issues and themes. It was an argument that was glibly plausible on the surface but transparently facile as soon as one considered the weight of human problems which sf writers have not even begun to touch. Take, for example, Man's brutish ability to do violence to himself, property and the world at large.

It is ironic that sf, which is so often concerned with intergalactic conflict, still tends to represent warfare as a somewhat magnified version of a schoolboy rough-and-tumble. In a genre which, on occasions, is supposedly satiric in purpose there seems to be a reluctance to explore the ways in which war reflects and shapes the society that wages it.

"An intimate relationship exists between a society's military institutions and its political and social organisation." The words are those of Professor Gordon A. Craig, whose series of essays on the art of warfare, on diplomacy and on the interaction between civil and military authorities is published under the title *War, Politics and Diplomacy* (Weidenfeld & Nicolson, 42s.).

The book covers a vast array of subjects, but basically Professor Craig's theme is to consider the relative positions of warfare and diplomacy at the time of the Congress of Vienna and to evaluate the changes in technique of, and, more importantly, attitudes to, both since then. In particular he is concerned with the impact on the world, and on the Great Powers of 1815 in particular, of the newly-emergent nations of the past half-century and the ways in which their influence has modified the diplomatic and aggressive attitudes of the nineteenth century Powers.

The delegates to the Congress of Vienna would probably find the multi-dimensional diplomacy of our time bewildering. So says Professor Craig and we might well ask why no one is asking what the rôle of warfare is to be in the future, thus saving us from potential bewilderment.

To turn to violence within the private rather than the public sector; criminal activity is an abnormal canker in the social body and yet it also serves as a delineator of the health of that body in that normality is such a vague concept that it is easiest to negatively define it by saying it is what is not abnormal. The whole question of what social forces produce criminal behaviour, particularly among the young, is one which should exercise us all and yet is one which has been noticeably avoided by speculative writers.

If any such is in search of inspirational material he could do no better than to read Dr. Donald West's *The Young Offender* (Penguin 6s.). In nearly 300 pages Dr. West exhaustively probes the entire problem of juvenile delinquency, piling facts and statistics in great heaps and yet still failing to provide many answers. As he says, *In truth, the subject of delinquency bristles with unanswerable questions . . .* (it) *. . . consists of a vast conglomeration of different phenomena . . .* (which) *. . . are so many-sided, so changeable, and so complex in all their moral and psychological ramifications that we have hardly got to the stage of stating the issues coherently, let alone resolving them.*

At one and the same time the book manages to horrify one with the scale of the problem and yet to bear a crumb of comfort in that Dr. West seems to suggest that criminal behaviour is a phase in the growing-up process that most boys and some girls all pass through, and happily, most grow out of. Crime statistics may be increasing but youth has always been rebellious. It is merely that today the opportunities for exhibiting that rebellion are so much greater than in the past. We have a problem but it is not new and it is depressingly normal to the human condition.

Both books I have mentioned serve to remind us that for the past two thousand years we have had a religious ideal of brotherly love and, at the end of that time, we are as far away as ever from the ideal. Was there ever a more apocalyptic theme for the speculative writer?

George Collyn

The Authors

GEORGE COLLYN is 30 years old, and has been writing for four years. Originally working for the BBC, he is now a director of a firm of consultants for the installation of closed-circuit TV units. Although his work has sold consistently well, he still regards writing as a spare-time occupation.

DR. JOHN GARDNER joined the English Electric Company as a mathematical physicist in 1956, before which he worked in academic research and, during the war, military operational research. His interest in off-beat generation has resulted in a book: *Electricity Without Dynamos* (Penguin, 1963). He is also the author of many scientific papers and review articles.

JOHN BRUNNER worked for a time on a technical magazine, and then in a publisher's office before turning freelance in 1958. He has now sold over forty successful books. A TV play, adapted from one of his stories, topped the viewers' ratings for the BBC series "Out of the Unknown".

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LONDON SF Circle meets 1st Thursday of every month at The Globe pub, Hatton Garden. Informal, no charges, all welcome, well-known authors always present.

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Karen, 8

Hangs around school. Hating going home. But scared to make friends.

Why should you worry? Karen lives in one of Britain's worst housing districts. That's why she involves you.

At only eight, she has withdrawn from normal childhood, afraid of close friendships because of the shame of her home. Home? One ill-lit room which is bedroom, kitchen, living-room, wash-room, everything-room for the family of seven. So, friendless, Karen hovers round school after lessons: It has some kind of security – and room to move. Not that Karen learns much at school. Children like her often have responses dulled from the start by their restricted environment, however hard parents try.

Shelter can rescue Karen and her family, if you help. Money given to Shelter buys houses and converts them into decent homes, to be let at fair rents to the most desperate of Britain's 3 million families living in slum and overcrowded conditions. Every pound is multiplied by loans and grants, so that every £325 can give a home to a family for life. Your gift, big or small, will work hard – and help rescue Britain's homeless.

Just about now, Karen goes back to school from a holiday in the slums. Compare her with your children. Send what you can.

SHELTER INVOLVES YOU

PHOTO: GRAHAM FINLAYSON

SHELTER

National Campaign for the Homeless
Room NW1, 86 The Strand, London, WC2

Please use my gift of £ ..... to help the homeless.

Name .....

Address .....

.....

I would like: to help ..... to have more information .....
to receive a covenant form .....

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